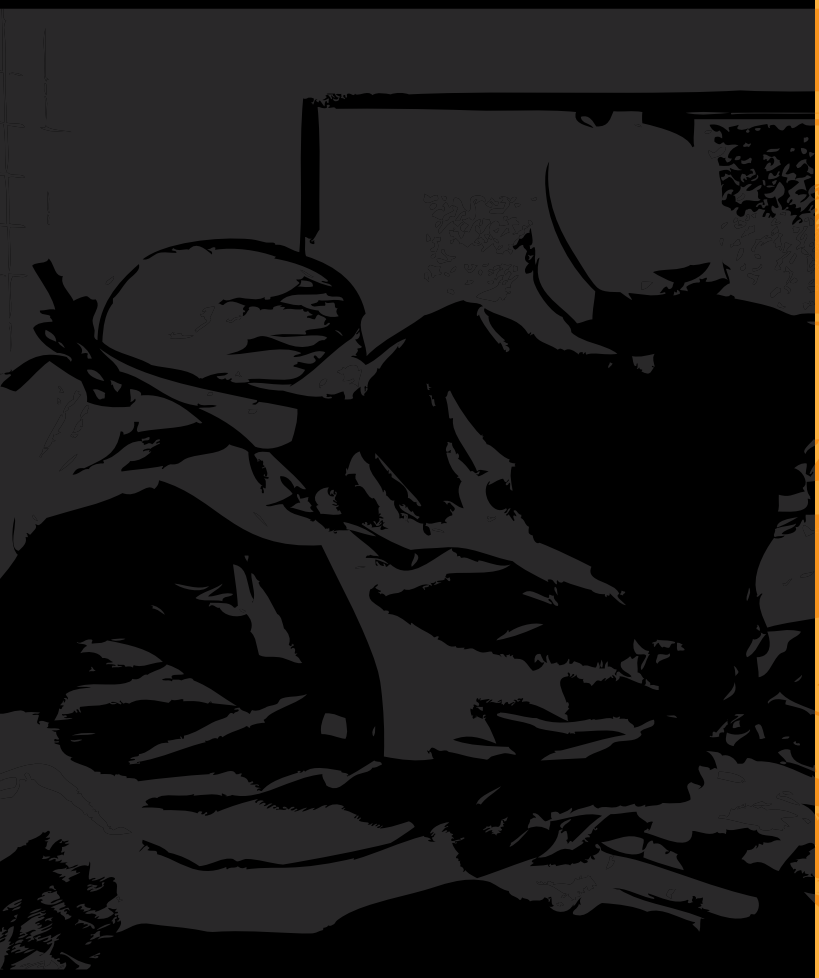
EISSN 1308-8521

ULUSAL CERRAHİ DERGİSİ

TURKISH JOURNAL OF SURGERY



CİLT | VOL. 32 SAYI | ISSUE 4
ARALIK | DECEMBER 2016

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ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Türk Cerrahi Derneği'nin resmi yayın organıdır. Derginin editöryel işleyişi, hakem seçimi, yazı değerlendirme, kabul ve ret süreçleri ve diğer tüm yayın politikası dernek yönetiminden bağımsız olarak yürütülmektedir. Ulusal Cerrahi Dergisi aynı zamanda Türk Hepato-Pankreato-Bilier Cerrahi Derneği ile Endokrin Cerrahisi Derneği'nin de resmi yayın organıdır.

Turkish Journal of Surgery is the official publication of Turkish Surgical Association. Editorial workflow, reviewer selection, manuscript evaluation, manuscript acceptance and rejection processes of the journal and the rest of the journal's policies are managed and carried out independently of the association management. Turkish Journal of Surgery is also the official publication of Turkish Hepatopancreatobiliary Surgery Association and Turkish Association of Endocrine Surgery.

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TURKISH JOURNAL OF SURGERY

Amaç ve Kapsam

Ulusal Cerrahi Dergisi (Ulus Cerrahi Derg); Türk Cerrahi Derneği, Hepato-Pankreato-Bilier Cerrahi Derneği ve Endokrin Cerrahisi Derneği'nin resmi yayın organıdır. Derginin finansmanı Türk Cerrahi Derneği tarafından karşılanmaktadır.

Yayın dili Türkçe ve İngilizce olan dergi, Mart, Haziran, Eylül ve Aralık aylarında olmak üzere yılda 4 sayı yayınlanmaktadır.

Ulusal Cerrahi Dergisi'nin hedefi, genel cerrahi alanında yapılan nitelikli özgün araştırmaları, güncel konularla ilgili derlemeleri ve nadir görülen olgu sunumlarını yayınlamaktır. Ayrıca, uzman yorumları, editöre mektup, bilimsel mektup ve cerrahi teknikle ilgili yayınlar kabul edilmekte, tıp ve cerrahi tarihi, etik, cerrahi eğitim ve adli tıp alanları ile ilgili çeşitli yazılar da dergide yer almaktadır.

Derginin hedef kitlesi, genel cerrahi uzmanları ve uzmanlık öğrencileri ile cerrahiyle ilgilenen diğer uzmanlar ve sağlık çalışanlarıdır.

Derginin editöryel ve yayın süreçleri International Committee of Medical Journal Editors (ICMJE), World Association of Medical Editors (WAME), Council of Science Editors (CSE), Committee on Publication Ethics (COPE), European Association of Science Editors (EASE) ve National Information Standards Organization (NISO) organizasyonlarının kılavuzlarına uygun olarak biçimlendirilir. Ulusal Cerrahi Dergisi, Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice) ilkelerini benimsemiştir.

Ulusal Cerrahi Dergisi; PubMed Central, Web of Science- Emerging Sources Citation Index, TÜBİTAK ULAKBİM TR Dizin, EMBASE, Scopus, EBSCO, CINAHL, ProQuest ve Index Copernicus tarafından indekslenmektedir.

Makale değerlendirme ve yayın işlemleri için yazarlardan ücret talep edilmemektedir. Tüm makaleler www.ulusalcerrahidergisi.org. sayfasındaki online makale değerlendirme sistemi kullanılarak dergiye gönderilmelidir. Derginin yazım kurallarına, gerekli formlara ve dergiyle ilgili diğer bilgilere web sayfasından erişilebilir.

Derginin tüm masrafları Türk Cerrahi Derneği tarafından karşılanmaktadır.

Dergide yayınlanan makalelerde ifade edilen bilgi, fikir ve görüşler Türk Cerrahi Derneği'nin, Baş Editör'ün, Editörlerin, Yayın Kurulu'nun ve Yayıncı'nın değil, yazar(lar)ın bilgi ve görüşlerini yansıtır. Baş Editör, Editörler, Yayın Kurulu ve Yayıncı, yazarlara ait bilgi ve görüşler için hiçbir sorumluluk ya da yükümlülük kabul etmemektedir.

Yayınlanan tüm içeriğe www.ulusalcerrahidergisi.org adresinden ücretsiz olarak erişilebilir.

Dergimizde asitsiz kağıt kullanılmaktadır.

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ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Aims and Scope

Turkish Journal of Surgery (Ulus Cerrahi Derg) is the official, peer reviewed, open access publication organ of the Turkish Surgical Association, Turkish Hepatopancreatobiliary Surgery Association and Turkish Association of Endocrine Surgery (TAES). The financial expenses of the journal are covered by the Turkish Surgical Association.

Turkish Journal of Surgery is published quarterly on March, June, September and December and its publication languages are both English and Turkish.

The aim of Turkish Journal of Surgery is to publish high quality research articles, review articles on current topics and rare case reports in the field of general surgery. Additionally, expert opinions, letters to the editor, scientific letters and manuscripts on surgical techniques are accepted for publication and various manuscripts on medicine and surgery history, ethics, surgical education and forensic medicine fields are included in the journal.

The journal is a surgical journal that covers all specialities and its target audience includes academicians, practitioners, specialists and students from all specialities of surgery.

The editorial and publication processes of the journal are shaped in accordance with the guidelines of the International Committee of Medical Journal Editors (ICMJE), World Association of Medical Editors (WAME), Council of Science Editors (CSE), Committee on Publication Ethics (COPE), European Association of Science Editors (EASE), and National Information Standards Organization (NISO). The journal is in conformity with the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

Turkish Journal of Surgery; is currently abstracted/indexed by PubMed Central, Web of Science- Emerging Sources Citation Index, TÜBİTAK ULAKBİM TR Dizin, EMBASE, Scopus, EBSCO, CINAHL, ProQuest and Index Copernicus.

Processing and publication are free of charge with the journal. No fees are requested from the authors at any point throughout the evaluation and publication process. All manuscripts must be submitted via the online submission system, which is available at www.ulusalcerrahidergisi.org. The journal guidelines, technical information, and the required forms are available on the journal's web page.

All expenses of the journal are covered by the Turkish Surgical Association.

Statements or opinions expressed in the manuscripts published in the journal reflect the views of the author(s) and not the opinions of the Turkish Surgical Association, editors, editorial board, and/or publisher; the editors, editorial board, and publisher disclaim any responsibility or liability for such materials.

All published content is available online, free of charge at www.ulusalcerrahidergisi.org.

The journal is printed on an acid-free paper.

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ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Yazarlara Bilgi

Ulusal Cerrahi Dergisi (Ulus Cerrahi Derg); Türk Cerrahi Derneği, Hepato-Pankreato-Bilier Cerrahi Derneği ve Endokrin Cerrahisi Derneği'nin resmi yayın organı olup, çift kör hakemlik sistemine göre yayınlanan açık erişimli bir dergidir. Derginin finansmanı Türk Cerrahi Derneği tarafından karşılanmaktadır.

Yayın dili Türkçe ve İngilizce olan Ulusal Cerrahi Dergisi, Mart, Haziran, Eylül ve Aralık aylarında olmak üzere yılda 4 sayı ve sadece elektronik olarak yayınlanmaktadır.

Ulusal Cerrahi Dergisi'nin hedefi, genel cerrahi alanında yapılan nitelikli özgün araştırmaları, güncel konularla ilgili derlemeleri ve nadir görülen olgu sunumlarını yayınlamaktır. Ayrıca, uzman yorumları, editöre mektup, bilimsel mektup ve cerrahi teknikle ilgili yayınlar kabul edilmekte, tıp ve cerrahi tarihi, etik, cerrahi eğitim ve adli tıp alanları ile ilgili çeşitli yazılar da dergide yer almaktadır.

Derginin editöryel ve yayın süreçleri International Committee of Medical Journal Editors (ICMJE), World Association of Medical Editors (WAME), Council of Science Editors (CSE), Committee on Publication Ethics (COPE), European Association of Science Editors (EASE) ve National Information Standards Organization (NISO) organizasyonlarının kılavuzlarına uygun olarak biçimlendirilmiştir. Ulusal Cerrahi Dergisi'nin editöryel ve yayın süreçleri, Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice) ilkelerine uygun olarak yürütülmektedir.

Özgünlük, yüksek bilimsel kalite ve atıf potansiyeli bir makalenin yayına kabulü için en önemli kriterlerdir. Gönderilen yazıların daha önce başka bir elektronik ya da basılı dergide, kitapta veya farklı bir mecrada sunulmamış ya da yayınlanmamış olması gerekir. Daha önce başka bir dergiye gönderilen ancak yayına kabul edilmeyen yazılar hakkında dergi önceden bilgilendirilmelidir. Bu yazıların eski hakem raporlarının Yayın Kuruluna gönderilmesi değerlendirme süresinin hızlanmasını sağlayacaktır. Toplantılarda sunulan çalışmalar için, sunum yapılan organizasyonun tam adı, tarihi, şehri ve ülkesi belirtilmelidir.

Ulusal Cerrahi Dergisi'ne gönderilen tüm makaleler çift-kör hakem değerlendirme sürecinden geçmektedir. Tarafsız değerlendirme sürecini sağlamak için her makale alanlarında uzman en az iki dış-bağımsız hakem tarafından değerlendirilir. Dergi Yayın Kurulu üyeleri tarafından gönderilecek makalelerin değerlendirme süreçleri, davet edilecek dış bağımsız editörler tarafından yönetilecektir. Bütün makalelerin karar verme süreçlerinde nihai karar yetkisi Baş Editör'dedir.

Klinik ve deneysel çalışmalar, ilaç araştırmaları ve bazı olgu sunumları için World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013, www.wma.net) çerçevesinde hazırlanmış Etik Komisyon raporu gerekmektedir. Gerekli görülmesi halinde Etik Komisyon raporu veya eşdeğeri olan resmi bir yazı yazarlardan talep edilebilir. İnsanlar üzerinde yapılmış deneysel çalışmaların sonuçlarını bildiren yazılarda, çalışmanın yapıldığı kişilere uygulanan prosedürlerin niteliği tümüyle açıklandıktan sonra, onaylarının alındığına ilişkin bir açıklamaya metin içinde yer verilmelidir. Hayvanlar üzerinde yapılan çalışmalarda ise ağrı, acı ve rahatsızlık verilmemesi için yapılmış olanlar açık olarak makalede belirtilmelidir. Hasta onamları, Etik Kurul raporun alındığı kurumun adı, onay belgesinin numarası ve tarihi ana metin dosyasında yer alan Gereç ve Yöntemler başlığı altında yazılmalıdır. Hastaların kimliklerinin gizliliğini korumak yazarların sorumluluğundadır. Hastaların kimliğini açığa çıkarabilecek fotoğraflar için hastadan ya da yasal temsilcilerinden alınan imzalı izinlerin de gönderilmesi gereklidir.

Bütün makalelerin benzerlik tespiti denetimi, iThenticate ve CrossCheck yazılımı aracılığıyla yapılmaktadır.

Yayın Kurulu, dergimize gönderilen çalışmalar hakkındaki intihal, atıf manipülasyonu ve veri sahteciliği iddia ve şüpheleri karşısında COPE kurallarına uygun olarak hareket edecektir.

Yazar olarak listelenen herkesin ICMJE (www.icmje.org) tarafından önerilen yazarlık kriterlerini karşılaması gerekmektedir. ICMJE, yazarların aşağıdaki 4 kriteri karşılamasını önermektedir:

1. Çalışmanın konseptine/tasarımına; ya da çalışma için verilerin toplanmasına, analiz edilmesine ve yorumlanmasına önemli katkı sağlamış olmak; VE
2. Yazı taslağını hazırlamış ya da önemli fikirsel içeriğin eleştirel incelemelerini yapmış olmak; VE
3. Yazının yayından önceki son halini gözden geçirmiş ve onaylamış olmak; VE
4. Çalışmanın herhangi bir bölümünün geçerliliği ve doğruluğuna ilişkin soruların uygun şekilde soruşturulduğunun ve çözümlendiğinin garantisini vermek amacıyla çalışmanın her yönünden sorumlu olmayı kabul etmek.

Bir yazar, çalışmada katkı sağladığı kısımların sorumluluğunu almasına ek olarak, diğer yazarların çalışmanın hangi kısımlarından sorumlu olduğunu da teşhis edebilmelidir. Ayrıca, yazarlar birbirlerinin katkılarının bütünlüğüne güven duymalıdır.

Yazar olarak belirtilen her kişi yazarlığın dört kriterini karşılamalıdır ve bu dört kriteri karşılayan her kişi yazar olarak tanımlanmalıdır. Dört kriterin hepsini karşılamayan kişilere makalenin başlık sayfasında teşekkür edilmelidir.

Yazarlık haklarına uygun hareket etmek ve hayalet ya da lütuf yazarlığın önlenmesini sağlamak amacıyla sorumlu yazarlar makale yükleme sürecinde www.ulusalcerrahidergisi.org adresinden erişebilinen Yazar Katkı Formu'nu imzalamalı ve taranmış versiyonunu yazıyla birlikte göndermelidir. Yayın Kurulu'nun gönderilen bir makalede "lütuf yazarlık" olduğundan şüphelenmesi durumunda söz konusu makale değerlendirme yapılmaksızın reddedilecektir. Makale gönderimi kapsamında; sorumlu yazar makale gönderim ve değerlendirme süreçleri boyunca yazarlık ile ilgili tüm sorumluluğu kabul ettiğini bildiren kısa bir ön yazı göndermelidir.

Ulusal Cerrahi Dergisi; gönderilen makalelerin değerlendirme sürecine dahil olan yazarların ve bireylerin, potansiyel çıkar çatışmasına ya da önyargıya yol açabilecek finansal, kurumsal ve diğer ilişkiler dahil mevcut ya da potansiyel çıkar çatışmalarını beyan etmelerini talep ve teşvik eder. Bir çalışma için bir birey ya da kurumdan alınan her türlü finansal destek ya da diğer destekler Yayın Kurulu'na beyan edilmeli ve potansiyel çıkar çatışmalarını beyan etmek amacıyla ICMJE Potansiyel Çıkar Çatışmaları Formu katkı sağlayan tüm yazarlar tarafından ayrı ayrı doldurulmalıdır. Editörler, yazarlar ve hakemler ile ilgili potansiyel çıkar çatışması vakaları derginin Yayın Kurulu tarafından COPE ve ICMJE rehberleri kapsamında çözülmektedir.

Derginin Yayın Kurulu, itiraz ve şikayet vakalarını, COPE rehberleri kapsamında işleme almaktadır. Yazarlar, itiraz ve şikayetleri için doğrudan Editöryel Ofis ile temasa geçebilirler. İhtiyaç duyulduğunda Yayın Kurulu'nun kendi içinde çözemediği konular için tarafsız bir temsilci atanmaktadır. İtiraz ve şikayetler için karar verme süreçlerinde nihai kararı Baş Editör verecektir.

Ulusal Cerrahi Dergisi'ne makale gönderirken makalelerinin telif haklarını Türk Cerrahi Derneği'ne devretmeyi kabul ederler. Reddedilen makalelerin telif hakları yazarlarına geri iade edilecektir. Ulusal Cerrahi Dergisi, her makalenin www.ulusalcerrahidergisi.org adresinden erişebileceğiniz Yayın Hakkı Devir Formu ile beraber gönderilmesini talep eder. Yazarlar, basılı ya da elektronik formatta yer alan resimler, tablolar ya da diğer her türlü içerik dahil daha önce yayınlanmış içeriği kullanırken telif hakkı sahibinden izin almalılardır. Bu konudaki yasal, mali ve cezai sorumluluk yazarlara aittir.

Dergide yayınlanan makalelerde ifade edilen görüşler ve fikirler Ulusal Cerrahi Dergisi, Baş Editör'ün, Editörlerin, Yayın Kurulu'nun ve Yayıncı'nın değil, yazar(lar)ın

bakış açılarını yansıtır. Baş Editör, Editörler, Yayın Kurulu ve Yayıncı bu gibi durumlar için hiçbir sorumluluk ya da yükümlülük kabul etmemektedir. Yayınlanan içerik ile ilgili tüm sorumluluk yazarlara aittir.

MAKALE HAZIRLAMA

Makaleler, ICMJE-Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals (updated in December 2015 - http://www.icmje. org/icmje-recommendations.pdf) ile uyumlu olarak hazırlanmalıdır. Randomize çalışmalar CONSORT, gözlemsel çalışmalar STROBE, tanısal değerli çalışmalar STARD, sistematik derleme ve meta-analizler PRISMA, hayvan deneyli çalışmalar ARRIVE ve randomize olmayan davranış ve halk sağlığıyla ilgili çalışmalar TREND kılavuzlarına uyumlu olmalıdır.

Makaleler sadece www.ulusalcerrahidergisi.org adresinde yer alan derginin online makale yükleme ve değerlendirme sistemi üzerinden gönderilebilir. Diğer mecralardan gönderilen makaleler değerlendirilmeye alınmayacaktır.

Gönderilen makalelerin dergi yazım kurallarına uygunluğu ilk olarak Editöryel Ofis tarafından kontrol edilecek, dergi yazım kurallarına uygun hazırlanmamış makaleler teknik düzeltme talepleri ile birlikte yazarlarına geri gönderilecektir.

Yazarların; Yayın Hakkı Devir Formu, Yazar Katkı Formu ve ICMJE Potansiyel Çıkar Çatışmaları Formu'nu (bu form, tüm yazarlar tarafından doldurulmalıdır) ilk gönderim sırasında online makale sistemine yüklemeleri gerekmektedir. Bu formlara www.ulusalcerrahidergisi.org adresinden erişilebilmektedir.

Başlık sayfası: Gönderilen tüm makalelerle birlikte ayrı bir başlık sayfası da gönderilmelidir. Bu sayfa;

- Makalenin başlığını ve 50 karakteri geçmeyen kısa başlığını,
- Yazarların isimlerini, kurumlarını ve eğitim derecelerini,
- Finansal destek bilgisi ve diğer destek kaynakları hakkında detaylı bilgiyi,
- Sorumlu yazarın ismi, adresi, telefonu (cep telefonu dahil), faks numarası ve e-posta adresini,
- Makale hazırlama sürecine katkıda bulunan ama yazarlık kriterlerini karşılamayan bireylerle ilgili bilgileri içermelidir.

Özet: Editöre Mektup türündeki yazılar dışında kalan tüm makalelerin Türkçe ve İngilizce özetleri olmalıdır. Özgün Araştırma makalelerinin özetleri "Amaç", "Gereç ve Yöntemler", "Bulgular" ve "Sonuç" alt başlıklarını içerecek biçimde hazırlanmalıdır.

Anahtar Sözcükler: Tüm makaleler en az 3 en fazla 6 anahtar kelimeyle birlikte gönderilmeli, anahtar sözcükler özetin hemen altına yazılmalıdır. Kısaltmalar anahtar sözcük olarak kullanılmamalıdır. Anahtar sözcükler National Library of Medicine (NLM) tarafından hazırlanan Medical Subject Headings (MeSH) veritabanından seçilmelidir.

Makale Türleri

Özgün Araştırma: Ana metin "Giriş", "Gereç ve Yöntemler", "Bulgular""Tartışma" ve Sonuç" alt başlıklarını içermelidir. Özgün Araştırmalarla ilgili kısıtlamalar için lütfen Tablo 1'i inceleyiniz.

Sonucu desteklemek için istatiksel analiz genellikle gereklidir. İstatistiksel analiz, tıbbi dergilerdeki istatistik verilerini bildirme kurallarına göre yapılmalıdır (Altman DG, Gore SM, Gardner MJ, Pocock SJ. Statistical guidelines for contributors to medical journals. Br Med J 1983: 7; 1489-93). İstatiksel analiz ile ilgili bilgi, Yöntemler bölümü içinde ayrı bir alt başlık olarak yazılmalı ve kullanılan yazılım kesinlikle tanımlanmalıdır.

Birimler, uluslararası birim sistemi olan International System of Units (SI)'a uygun olarak hazırlanmadır.

Editöryel Yorum: Dergide yayınlanan bir araştırmanın, o konunun uzmanı olan veya üst düzeyde değerlendirme yapan bir hakemi tarafından kısaca yorumlanması amacını taşımaktadır. Yazarları, dergi tarafından seçilip davet edilir. Özet, anahtar sözcük, tablo, şekil, resim ve diğer görseller kullanılmaz.

Derleme: Yazının konusunda birikimi olan ve bu birikimleri uluslararası literatüre yayın ve atıf sayısı olarak yansımış uzmanlar tarafından hazırlanmış yazılar değerlendirmeye alınır. Yazarları dergi tarafından da davet edilebilir. Bir bilgi ya da konunun klinikte kullanılması için vardığı son düzeyi anlatan, tartışan, değerlendiren ve gelecekte yapılacak olan çalışmalara yön veren bir formatta hazırlanmalıdır. Ana metin "Giriş", "Klinik ve Araştırma Etkileri" ve "Sonuç" bölümlerini içermelidir. *Derleme türündeki yazılarla ilgili kısıtlamalar için lütfen Tablo 1'i inceleyiniz.*

Olgu Sunumu: Olgu sunumları için sınırlı sayıda yer ayrılmakta ve sadece ender görülen, tanı ve tedavisi güç olan hastalıklarla ilgili, yeni bir yöntem öneren, kitaplarda yer verilmeyen bilgileri yansıtan, ilgi çekici ve öğretici özelliği olan olgular yayına kabul edilmektedir. Ana metin; "Giriş", "Olgu Sunumu", "Tartışma" ve Sonuç" alt başlıklarını içermelidir. *Olgu Sunumlarıyla ilgili kısıtlamalar için lütfen Tablo 1'i inceleyiniz.*

Cerrahi Teknikler: Hastalıkların tanı ve tedavisindeki temel mekanizmalara vurgu yapan, farklılıkları ve sıra dışı durumları göz önüne çıkaran, özellikle tedavide yeni yöntem ve seçenekleri anlatan ve en önemlisi de dikkat çekici, çarpıcı ve ender görülen olguların görüntüleri değerlendirmeye alınır. Bu tür yazılarda görseller daha önemlidir ve video görüntülerle desteklenmesi yazının değerlendirilmesi ve kabul edilmesini kolaylaştırabilir. Video görüntüleri "wmv", "avi" veya "mpeg" formatında hazırlanmalı ve yazı dosyalarıyla birlikte online sisteme yüklenmelidir.

Editöre Mektup: Dergide daha önce yayınlanan bir yazının önemini, gözden kaçan bir ayrıntısını ya da eksik kısımlarını tartışabilir. Ayrıca derginin kapsamına giren alanlarda okurların ilgisini çekebilecek konular ve özellikle eğitici olgular hakkında da Editöre Mektup formatında yazılar yayınlanabilir. Okuyucular da yayınlanan yazılar hakkında yorum içeren Editöre Mektup formatında yazılarını

Tablo 1. Makale türleri için kısıtlamalar

Makale türü	Sözcük limiti	Özet sözcük limiti	Kaynak limiti	Tablo limiti	Resim limiti
Özgün Araştırma	5000	250 (Alt başlıklı)	50	6	7 ya da toplamda 15 resim
Derleme	5000	250	50	6	10 ya da toplamda 20 resim
Olgu Sunumu	1500	250	15	Tablo yok	10 ya da toplamda 20 resim
Cerrahi Teknik	500	Uygulanamaz	5	Tablo yok	10 ya da toplamda 20 resim
Editöre Mektup	500	Uygulanamaz	5	Tablo yok	Resim yok

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sunabilirler. Özet, anahtar sözcük, tablo, şekil, resim ve diğer görseller kullanılmaz. Ana metin alt başlıksız olmalıdır. Hakkında mektup yazılan yayına ait cilt, yıl, sayı, sayfa numaraları, yazı başlığı ve yazarların adları açık bir şekilde belirtilmeli, kaynak listesinde yazılmalı ve metin içinde atıfta bulunulmalıdır.

Tablolar

Tablolar ana dosyaya eklenmeli, kaynak listesi sonrasında sunulmalı, ana metin içerisindeki geçiş sıralarına uygun olarak numaralandırılmadır. Tabloların üzerinde tanımlayıcı bir başlık yer almalı ve tablo içerisinde geçen kısaltmaların açılımları tablo altına tanımlanmalıdır. Tablolar Microsoft Office Word dosyası içinde "Tablo Ekle" komutu kullanılarak hazırlanmalı ve kolay okunabilir şekilde düzenlenmelidir. Tablolarda sunulan veriler ana metinde sunulan verilerin tekrarı olmamalı; ana metindeki verileri destekleyici nitelikte olmalılardır.

Resim ve Resim Altyazıları

Resimler, grafikler ve fotoğraflar (TIFF ya da JPEG formatında) ayrı dosyalar halinde sisteme yüklenmelidir. Görseller bir Word dosyası dokümanı ya da ana doküman içerisinde sunulmamalıdır. Alt birimlere ayrılan görseller olduğunda, alt birimler tek bir görsel içerisinde verilmemelidir. Her bir alt birim sisteme ayrı bir dosya olarak yüklenmelidir. Resimler alt birimleri belli etme amacıyla etiketlenmemelidir (a, b, c vb.). Resimlerde altyazıları desteklemek için kalın ve ince oklar, ok başları, yıldızlar, asteriksler ve benzer işaretler kullanılabilir. Makalenin geri kalanında olduğu gibi resimler de kör olmalıdır. Bu sebeple, resimlerde yer alan kişi ve kurum bilgileri de körleştirilmelidir. Görsellerin minimum çözünürlüğü 300DPI olmalıdır. Değerlendirme sürecindeki aksaklıkları önlemek için gönderilen bütün görsellerin çözünürlüğü net ve boyutu büyük (minimum boyutlar 100x100 mm) olmalıdır. Resim altyazıları ana metnin sonunda yer almalıdır.

Makale içerisinde geçen tüm kısaltmalar, ana metin ve özette ayrı ayrı olmak üzere ilk kez kullanıldıkları yerde tanımlanarak kısaltma tanımın ardından parantez içerisinde verilmelidir.

Ana metin içerisinde cihaz, yazılım, ilaç vb. ürünlerden bahsedildiğinde ürünün ismi, üreticisi, üretildiği şehir ve ülke bilgisini içeren ürün bilgisi parantez içinde verilmelidir; "Discovery St PET/CT scanner (General Electric, Milwaukee, WI, USA)".

Tüm kaynaklar, tablolar ve resimlere ana metin içinde uygun olan yerlerde sırayla numara verilerek atıf yapılmalıdır.

Özgün araştırmaların kısıtlamaları, engelleri ve yetersizliklerinden Sonuç paragrafı öncesi "Tartışma" bölümünde bahsedilmelidir.

Kaynaklar

Atıf yapılırken en son ve en güncel yayınlar tercih edilmelidir. Atıf yapılan erken çevrimiçi makalelerin DOI numaraları mutlaka sağlanmalıdır. Kaynakların doğruluğundan yazarlar sorumludur. Dergi isimleri Index Medicus/Medline/PubMed'de yer alan dergi kısaltmaları ile uyumlu olarak kısaltılmalıdır. Altı ya da daha az yazar olduğunda tüm yazar isimleri listelenmelidir. Eğer 7 ya da daha fazla yazar varsa ilk 6 yazar yazıldıktan sonra "et al" konulmalıdır. Ana metinde kaynaklara atıf yapılırken parantez içinde Arabik numaralar kullanılmalıdır. Farklı yayın türleri için kaynak stilleri aşağıdaki örneklerde sunulmuştur:

Dergi makalesi: Rankovic A, Rancic N, Jovanovic M, Ivanović M, Gajović O, Lazić Z, et al. Impact of imaging diagnostics on the budget – Are we spending too much? Vojnosanit Pregl 2013; 70: 709-11.

Kitap bölümü: Suh KN, Keystone JS. Malaria and babesiosis. Gorbach SL, Barlett JG, Blacklow NR, editors. Infectious Diseases. Philadelphia: Lippincott Williams; 2004.p.2290-308.

Tek yazarlı kitap: Sweetman SC. Martindale the Complete Drug Reference. 34th ed. London: Pharmaceutical Press; 2005.

Yazar olarak editör(ler): Huizing EH, de Groot JAM, editors. Functional reconstructive nasal surgery. Stuttgart-New York: Thieme; 2003.

Toplantıda sunulan yazı: Bengisson S. Sothemin BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sept 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. pp.1561-5.

Bilimsel veya teknik rapor: Cusick M, Chew EY, Hoogwerf B, Agrón E, Wu L, Lindley A, et al. Early Treatment Diabetic Retinopathy Study Research Group. Risk factors for renal replacement therapy in the Early Treatment Diabetic Retinopathy Study (ETDRS), Early Treatment Diabetic Retinopathy Study Kidney Int: 2004. Report No: 26.

Tez: Yılmaz B. Ankara Üniversitesindeki Öğrencilerin Beslenme Durumları, Fiziksel Aktiviteleri ve Beden Kitle İndeksleri Kan Lipidleri Arasındaki Ilişkiler. H.Ü. Sağlık Bilimleri Enstitüsü, Doktora Tezi. 2007.

Yayına kabul edilmiş ancak henüz basılmamış yazılar: Slots J. The microflora of black stain on human primary teeth. Scand J Dent Res. 1974.

Erken Çevrimiçi Yayın: Cai L, Yeh BM, Westphalen AC, Roberts JP, Wang ZJ. Adult living donor liver imaging. Diagn Interv Radiol 2016 Feb 24. doi: 10.5152/dir.2016.15323. [Epub ahead of print].

Elektronik formatta yayınlanan yazı: Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis (serial online) 1995 Jan-Mar (cited 1996 June 5): 1(1): (24 screens). Available from: URL: http:/ www.cdc.gov/ncidodlEID/cid.htm.

REVİZYONLAR

Yazarlar makalelerinin revizyon dosyalarını gönderirken, ana metin üzerinde yaptıkları değişiklikleri işaretlemeli, ek olarak, hakemler tarafından öne sürülen önerilerle ilgili notlarını "Hakemlere Cevap" dosyasında göndermelidir. Hakemlere Cevap dosyasında her hakemin yorumunun ardından yazarın cevabı gelmeli ve değişikliklerin yapıldığı satır numaraları da ayrıca belirtilmelidir. Revize makaleler karar mektubunu takip eden 30 gün içerisinde dergiye gönderilmelidir. Makalenin revize versiyonu belirtilen süre içerisinde yüklenmezse, revizyon seçeneği iptal olabilir. Yazarların revizyon için ek süreye ihtiyaç duymaları durumunda uzatma taleplerini ilk 30 gün sona ermeden dergiye iletmeleri gerekmektedir.

Yayına kabul edilen makaleler dil bilgisi, noktalama ve biçim açısından kontrol edilir. Yayın süreci tamamlanan makaleler, yayın planına dahil edildikleri sayıyla birlikte yayınlanmadan önce erken çevrimiçi formatında dergi web sitesinde yayına alınır. Kabul edilen makalelerin baskıya hazır PDF dosyaları sorumlu yazarlara iletilir ve yayın onaylarının 2 gün içerisinde dergiye iletilmesi istenir.

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Turkish Journal of Surgery is an online-only publication. It is published quarterly on March, June, September and December and its publication languages are both English and Turkish.

The aim of Turkish Journal of Surgery is to publish high quality research articles, review articles on current topics and rare case reports in the field of general surgery. Additionally, expert opinions, letters to the editor, scientific letters and manuscripts on surgical techniques are accepted for publication and various manuscripts on medicine and surgery history, ethics, surgical education and forensic medicine fields are included in the journal.

The editorial and publication processes of the journal are shaped in accordance with the guidelines of the International Council of Medical Journal Editors (ICMJE), the World Association of Medical Editors (WAME), the Council of Science Editors (CSE), the Committee on Publication Ethics (COPE), the European Association of Science Editors (EASE), and National Information Standards Organization (NISO). The journal conforms to the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

Originality, high scientific quality, and citation potential are the most important criteria for a manuscript to be accepted for publication. Manuscripts submitted for evaluation should not have been previously presented or already published in an electronic or printed medium. The journal should be informed of manuscripts that have been submitted to another journal for evaluation and rejected for publication. The submission of previous reviewer reports will expedite the evaluation process. Manuscripts that have been presented in a meeting should be submitted with detailed information on the organization, including the name, date, and location of the organization.

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All submissions are screened by a similarity detection software (iThenticate by CrossCheck).

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1- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2- Drafting the work or revising it critically for important intellectual content; AND
3- Final approval of the version to be published; AND
4- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to being accountable for the parts of the work he/she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors.

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The manuscripts should be prepared in accordance with ICMJE-Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (updated in December 2015 - http://www.icmje.org/icmje-recommendations.pdf). Authors are required to prepare manuscripts in accordance with the CONSORT guidelines for randomized research studies, STROBE guidelines for observational original research studies, STARD guidelines for studies on diagnostic accuracy, PRISMA guidelines for systematic reviews and meta-analysis, ARRIVE guidelines for experimental animal studies, and TREND guidelines for non-randomized public behavior.

Manuscripts can only be submitted through the journal's online manuscript submission and evaluation system, available at www.ulusalcerrahidergisi.org. Manuscripts submitted via any other medium will not be evaluated.

Manuscripts submitted to the journal will first go through a technical evaluation process where the editorial office staff will ensure that the manuscript has been prepared and submitted in accordance with the journal's guidelines. Submissions that do not conform to the journal's guidelines will be returned to the submitting author with technical correction requests.

Authors are required to submit the following:

- Copyright Transfer Form,
- Author Contributions Form, and
- ICMJE Potential Conflict of Interest Disclosure Form (should be filled in by all contributing authors)

during the initial submission. These forms are available for download at www.ulusalcerrahidergisi.org.

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- The full title of the manuscript as well as a short title (running head) of no more than 50 characters,
- Name(s), affiliations, and highest academic degree(s) of the author(s),
- Grant information and detailed information on the other sources of support,
- Name, address, telephone (including the mobile phone number) and fax numbers, and email address of the corresponding author,
- Acknowledgment of the individuals who contributed to the preparation of the manuscript but who do not fulfill the authorship criteria.

Abstract: A Turkish and an English abstract should be submitted with all submissions except for Letters to the Editor. Submitting a Turkish abstract is not compulsory for international authors. The abstract of Original Articles should be structured with subheadings (Objective, Material and Methods, Results, and Conclusion). Please check Table 1 below for word count specifications.

Keywords: Each submission must be accompanied by a minimum of three to a maximum of six keywords for subject indexing at the end of the abstract. The keywords should be listed in full without abbreviations. The keywords should be selected from the National Library of Medicine, Medical Subject Headings database (https://www.nlm.nih.gov/mesh/MBrowser.html).

Manuscript Types

Original Articles: This is the most important type of article since it provides new information based on original research. The main text of original articles should be structured with Introduction, Material and Methods (with subheadings), Results, Discussion, , Conclusion subheadings. Please check Table 1 for the limitations for Original Articles.

Statistical analysis to support conclusions is usually necessary. Statistical analyses must be conducted in accordance with international statistical reporting standards (Altman DG, Gore SM, Gardner MJ, Pocock SJ. Statistical guidelines for contributors to medical journals. Br Med J 1983: 7; 1489-93). Information on statistical analyses should be provided with a separate subheading under the Material and Methods section and the statistical software that was used during the process must be specified.

Units should be prepared in accordance with the International System of Units (SI).

Expert Opinions: Editorial comments aim to provide a brief critical commentary by reviewers with expertise or with high reputation in the topic of the research article published in the journal. Authors are selected and invited by the journal to provide such comments. Abstract, Keywords, and Tables, Figures, Images, and other media are not included.

Review Articles: Reviews prepared by authors who have extensive knowledge on a particular field and whose scientific background has been translated into a high

volume of publications with a high citation potential are welcomed. These authors may even be invited by the journal. Reviews should describe, discuss, and evaluate the current level of knowledge of a topic in clinical practice and should guide future studies. The main text should contain Introduction, Clinical and Research Consequences, and Conclusion sections. Please check Table 1 for the limitations for Review Articles.

Case Reports: There is limited space for case reports in the journal and reports on rare cases or conditions that constitute challenges in diagnosis and treatment, those offering new therapies or revealing knowledge not included in the literature, and interesting and educative case reports are accepted for publication. The text should include Introduction, Case Presentation, Discussion, and Conclusion subheadings. Please check Table 1 for the limitations for Case Reports.

Surgical Methods: Images of remarkable, striking and rare cases that emphasize the basic mechanisms of diagnosis and treatment of diseases, express discrepancies and extraordinary situations and explain new treatment techniques and options are evaluated for publication. Display items are important in this type of manuscripts and supporting the manuscript with video (in WMV, AVI or MPEG formats) images can facilitate a faster evaluation process and increase the possibility of publication.

Letters to the Editor: This type of manuscript discusses important parts, overlooked aspects, or lacking parts of a previously published article. Articles on subjects within the scope of the journal that might attract the readers' attention, particularly educative cases, may also be submitted in the form of a "Letter to the Editor." Readers can also present their comments on the published manuscripts in the form of a "Letter to the Editor." Abstract, Keywords, and Tables, Figures, Images, and other media should not be included. The text should be unstructured. The manuscript that is being commented on must be properly cited within this manuscript.

Tables

Tables should be included in the main document, presented after the reference list, and they should be numbered consecutively in the order they are referred to within the main text. A descriptive title must be placed above the tables. Abbreviations used in the tables should be defined below the tables by footnotes (even if they are defined within the main text). Tables should be created using the "insert table" command of the word processing software and they should be arranged clearly to provide easy reading. Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text.

Figures and Figure Legends

Figures, graphics, and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labeled (a, b, c, etc.) to indicate figure subunits. Thick and thin arrows, arrowheads, stars, asterisks, and similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures too should be blind. Any information within the images that may indicate an individual or institution should be blinded. The minimum resolution of each submitted figure should be 300 DPI. To prevent delays in the evaluation process, all submitted figures should be clear in resolution and large in size (minimum dimensions: 100 × 100 mm). Figure legends should be listed at the end of the main document.

All acronyms and abbreviations used in the manuscript should be defined at first use, both in the abstract and in the main text. The abbreviation should be provided in parentheses following the definition.

When a drug, product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in USA), should be provided in parentheses in the following format: "Discovery St PET/CT scanner (General Electric, Milwaukee, WI, USA)"

All references, tables, and figures should be referred to within the main text, and they should be numbered consecutively in the order they are referred to within the main text.

Limitations, drawbacks, and the shortcomings of original articles should be mentioned in the Discussion section before the conclusion paragraph.

References

While citing publications, preference should be given to the latest, most up-to-date publications. If an ahead-of-print publication is cited, the DOI number should be provided. Authors are responsible for the accuracy of references. Journal titles should be abbreviated in accordance with the journal abbreviations in Index Medicus/ MEDLINE/PubMed. When there are six or fewer authors, all authors should be listed. If there are seven or more authors, the first six authors should be listed followed by "et al." In the main text of the manuscript, references should be cited using Arabic numbers in parentheses. The reference styles for different types of publications are presented in the following examples.

Table 1. Limitations for each manuscript type

Type of manuscript	Word limit	Abstract word limit	Reference limit	Table limit	Figure limit
Original Article	5000	250 (Structured)	50	6	7 or tatal of 15 images
Review Article	5000	250	50	6	10 or total of 20 images
Case Report	1500	250	15	No tables	10 or total of 20 images
Surgical Methods	500	No abstract	5	No tables	10 or total of 20 images
Letter to the Editor	500	No abstract	5	No tables	No media

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Journal Article: Rankovic A, Rancic N, Jovanovic M, Ivanović M, Gajović O, Lazić Z, et al. Impact of imaging diagnostics on the budget – Are we spending too much? Vojnosanit Pregl 2013; 70: 709-11.

Book Section: Suh KN, Keystone JS. Malaria and babesiosis. Gorbach SL, Barlett JG, Blacklow NR, editors. Infectious Diseases. Philadelphia: Lippincott Williams; 2004.p.2290-308.

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REVISIONS

When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue raised by the reviewers has been covered and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document. Revised manuscripts must be submitted within 30 days from the date of the decision letter. If the revised version of the manuscript is not submitted within the allocated time, the revision option may be canceled. If the submitting author(s) believe that additional time is required, they should request this extension before the initial 30-day period is over.

Accepted manuscripts are copy-edited for grammar, punctuation, and format. Once the publication process of a manuscript is completed, it is published online on the journal's webpage as an ahead-of-print publication before it is included in its scheduled issue. A PDF proof of the accepted manuscript is sent to the corresponding author and their publication approval is requested within 2 days of their receipt of the proof.

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ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

İçindekiler

ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Contents

ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Editörden

Değerli okurlarımız,

Dergimiz 2014 - 2016 yılları arasında sizlerin yaptığı bilimsel katkılar sonucunda 2015 yılında PubMed dizininde "Ulus Cerrahi Derg" kısaltma adıyla yerini almış ve 2016 yılında da Web of Science içinde yeni oluşturulan Emerging Sources Citation Index'e (ESCI) kabul edilmiştir. PubMed dizininde dergimizde yayınlanan makalelerin okunma sayısı her geçen gün artmaktadır. En son amacımız Ulusal Cerrahi Dergisi'nin Science Citation Index (SCI) ve Science Citation Index Expanded (SCIE) dizinleri içinde yer almasıdır. Bu amacımıza ulaşabilmek için sizlerin SCI ve SCIE dizinlerinde yer alan dergilere gönderdiğiniz makalelerinizde dergimizde yayınlanan makalelere atıfta bulunmanız önem taşımaktadır. 2017 yılı içinde sizlerin destekleriyle dergimizin bu dizinlere de kabul edilebileceği düşüncesindeyiz.

Bu sayımızda yine değerli klinik ve deneysel araştırmalar yer almaktadır. Ratlarda oluşturulan arseniğe bağlı karaciğer hasarının onarılmasında melatoninin etkisini inceleyen deneysel araştırma bu kategorideki çalışmalara iyi bir örnektir. Bir başka çalışma ise ülkemizde yapılan hayvan deneylerinin nedenlerini sorgulamaktadır. Alt rektum kanserlerinde uygulanan ekstralevator abdominoperineal eksizyon ve pankreas kanserlerinde yapılan pankreatikoduodenektominin cerrahi varyasyonlarını karşılaştıran çalışmalarda klinikler kendi deneyimlerini aktarmaktadır.

Son yıllarda laparoskopik cerrahi uygulamaları içinde popüler bir konu olan morbid obezitede laparoskopik sleeve gastrektomi sonuçlarına etki eden faktörleri araştıran ve komplikasyonlarıyla başa çıkma yöntemlerini gösteren klinik çalışmalar meslektaşlarımıza yol gösterici olacaktır. Konya ilinde karşılanan cerrahi aciller ve Samsun ilinde yapılan mastit konusundaki farkındalıkla ilgili araştırmalar ülkemizin farklı yerlerindeki durumu tespit etmek açısından değerlidir. Bir başka çalışma ise kongrelere gönderilen gözlemsel çalışmaların değerlendirilmesi için yeni bir sistem önermektedir. Laparoskopik kolesistektomi sırasında oluşan safra yolları yaralanmalarının yönetimi ve intraabdominal infeksiyonlarla ilgili konsensus raporları ve Amerikan Tiroid Birliği'nin 2015 kılavuzunun Türkçesi'ne bağlantı veren editöre mektup yazıları da bu konulara ilgi duyan meslektaşlarımız için yararlı olacaktır.

Sonraki sayılarda daha iyi haberlerle buluşmak dileğiyle saygılar sunarım.

Can Atalay
Editör

ULUSAL CERRAHİ DERGİSİ
TURKISH JOURNAL OF SURGERY

Editorial

Dear readers,

Our journal has been included in the PubMed directory as "Ulus Cerrahi Derg" in 2015 due to your scientific contributions between 2014 and 2016, and has been accepted to the newly created Emerging Sources Citation Index (ESCI) within the Web of Science in 2016. In the PubMed directory, the visibility numbers of the articles published in our magazine increase day by day. Our ultimate goal is acceptance of the Turkish Journal of Surgery in the Science Citation Index (SCI) and the Science Citation Index Expanded (SCIE) directories. To reach this goal, it is important that you cite the articles published in our journal in the articles you submit to the journals included in the SCI and SCIE directories. With your support, we think our magazine can be accepted to these indices as of 2017.

Clinical and experimental studies of benefit are presented in this issue. The experimental research study examining the effect of melatonin on the repair of aresnic induced liver damage in rats is a good example of its category. Another study investigated the reasons for using animal studies in our country. In the studies on extralevator abdominoperineal excision in low rectum cancer and on pancreaticoduodenectomy in pancreatic cancer, the clinics share their experiences.

Clinical trials focusing on the factors affecting the results of laparoscopic sleeve gastrectomy in morbid obesity, a recently popular topic in laparoscopic surgery, and showing how to cope with complications will guide our colleagues. The survey on surgical emergencies in Konya province and the study on the awareness about mastitis in Samsun province delineate the situation in different regions of our country. Another study suggests a new system for the evaluation of observational studies that are sent to Congresses. The consensus reports on the management of biliary tract injuries during laparoscopic cholecystectomy and intraabdominal infections, as well as the editorial letter including a link to the Turkish version of American Thyroid Association's 2015 guideline will also be of interest to our colleagues.

Hoping to meet with better news in the upcoming issues.

Can Atalay
Editor

Ulus Cerrahi Derg 2016; 32: 233-237
DOI: 10.5152/UCD.2015.3224

The effects of melatonin on liver functions in arsenic-induced liver damage

Arseniğin sebep olduğu karaciğer hasarında melatoninin karaciğer foksiyonları üzerine etkileri

İlhan Bali[1], Bülent Bilir[2], Seyfi Emir[1], Filiz Turan[3], Ahsen Yılmaz[4], Tuba Gökkuş[4], Murat Aydın[4]

ABSTRACT

Objective: Arsenic exposure is increasing in communities due to environmental pollution and industrial development. Arsenic is toxic to organ systems because it causes oxidative stress, enzymatic inhibition, and damage to protein structures. The liver, for example, is an organ that may be damaged by arsenic, and this damage may cause various clinical conditions like hepatic failure or cancer. Melatonin is a hormone that acts like an antioxidant, an anti-inflammatory agent, and a cytoprotective agent. In this study, we aimed to evaluate melatonin's protective effects on livers damaged by arsenic toxicity.

Materials and Methods: Twenty-four Sprague-Dawley male rats were classified into three groups: a control group, an arsenic applied group, and an arsenic plus 10 mg/kg melatonin applied group. At the end of the fifteen-day experiment, the rats were sacrificed. Albumin, interleukin-6 (IL-6), total protein, alanine transaminase, aspartate transaminase, macrophage migration inhibitory factor, and monocyte chemotactic protein-1 measurements were obtained.

Results: In rats with liver damage due to arsenic exposure, melatonin administration significantly decreased the levels of IL-6, macrophage migration inhibitory factor, and monocyte chemotactic protein-1 ($p<0.001$, $p=0.02$ and $p=0.04$, respectively).

Conclusion: After evaluating liver enzymes and inflammatory markers, this study determined that melatonin exposure improves liver tissue damage caused by arsenic exposure, with the degree of improvement varying based on the levels of arsenic exposure.

Keywords: Arsenic, interleukin-6, macrophage migration inhibitory factor, melatonin, monocyte chemotactic protein 1

ÖZ

Amaç: Sanayideki gelişim ve artan çevre kirliliği sonucunda toplumda arsenik maruziyeti artmaktadır. Arsenik oksidatif hasar, enzim inhibisyonu ve protein yapılara zarar verici etkisiyle organ sistemlerine toksik etki gösterir. Arseniğin ciddi hasar verdiği organlardan biri de karaciğer olup, karaciğer yetmezliğinden kansere kadar farklı düzeylerde tablolara neden olmaktadır. Melatonin antioksidan, anti-inflamatuvar ve sitoprotektif etki gösteren bir hormondur. Bu çalışmada arsenik toksisitesi ile oluşturulan karaciğer hasarında melatoninin koruyucu etkileri araştırılmıştır.

Gereç ve Yöntemler: Çalışmada 24 adet Sprague-Dawley türü erkek sıçandan üç grup oluşturulmuştur. Kontrol grubu, arsenik uygulan grup ve arsenik ile 10 mg/kg melatonin verilen grupta, 15 günlük deney sonunda hayvanlar sakrifiye edildikten sonra serumda aspartat transaminaz, alanin transaminaz, total protein, albumin, interlökin-6, makrofaj migrasyon inhibitör faktör, monosit kemotaktik protein-1 ölçümleri yapılmıştır.

Bulgular: Arsenik maruziyetinde melatonin uygulamasının interlökin-6, makrofaj migrasyon inhibitör faktör, ve monosit kemotaktik protein-1 düzeylerinde anlamlı bir azalmaya yol açtığı tespit edilmiştir. (sırasıyla $p<0,001$, $p=0,02$ ve $p=0,04$).

Sonuç: Karaciğer enzimleri ve inflamatuvar belirteçler üzerinde yapmış olduğumuz bu çalışma sonucunda, arsenik maruziyetine bağlı olarak karaciğerde oluşan doku hasarında melatonin etkisiyle düzelme sağlandığı tespit edilmiştir.

Anahtar Kelimeler: Arsenik, melatonin, interlökin-6, makrofaj migrasyon inhibitör faktör, monosit kemotaktik protein 1

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Received / *Geliş Tarihi*: 08.06.2015
Accepted / *Kabul Tarihi*: 04.08.2015
Available Online Date / *Çevrimiçi Yayın Tarihi*: 27.10.2016

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Arsenic, one of the most prevalent element on earth, belongs to the group of heavy metals (1, 2). Inorganic arsenic, which is the most prevalent type, dominates sea water, surface waters, and underground water. Conversely, organic forms of arsenic are found within natural gas and petroleum (3). Arsenic can easily change oxidation steps and chemical forms in nature. Arsenic valence and type are affected by redox potential, pH of the water, microbiologic activity, and the presence of ions like sulfur, iron, and calcium (3). In recent years, arsenic exposure has increased because of pollution and industrial development (4). Particularly, the agriculture chemicals used in dyes, ceramics, cancer drugs, mining operations, and herbicides and insecticides are leading routes of exposition (5-7). Long periods of arsenic intake by mouth or through inhalation cause both metabolic and structural changes in the hepatocyte mitochondria (8). Arsenic causes hepatocyte degeneration, inflammation, and necrosis. It also causes increased apoptosis, oxidative damage, and damage at lipid peroxidation (9, 10).

Melatonin is primarily secreted from a neuroendocrine organ called the pineal gland. It is also secreted from the skin, the retina, testicles, bone marrow, thrombocytes, lymphocytes, and the gastrointestinal system (11-17). Melatonin synthesis and release are both stimulated by darkness and repressed by light. Melatonin is a strong free radical sweeper agent, as demonstrated in both in vivo and in vitro studies (18-20). It is much more powerful than all known antioxidants due to its free radical catching effects. Studies have shown that it is a more potent antioxidant than vitamin E and glutathione (21, 22). This is primarily because melatonin can dissolve in either water or fat, thus affecting all cell components (19-23). Melatonin also reportedly has regulatory effects on immunity and anti-inflammation (24-26). The aim of this study was to investigate the regulatory effects of melatonin on arsenic toxicity by monitoring hepatic enzymes and inflammatory markers in rats whose livers were intentionally damaged by arsenic for experimental purposes.

MATERIAL AND METHODS

Study Group

Twenty-four male Sprague-Dawley rats were used in the experiment. Rats were kept at 22°C under illumination control (14 hours light/10 hours dark cycle). They were monitored in standard cages in an air-conditioned room. All rats weighed 250-300 g and were obtained from the animals laboratory at Namık Kemal University. The use of laboratory animals, animal experiments, and procedures were performed in accordance with national guidelines for care and were approved by the Namık Kemal University Animal Experiment Local Ethics Committee (NKU-HADYEK Decision No: 03/2015). The group formation was planned as follows:

The control group (n=8) was given 10 mL/kg of 0.9% NaCl every day through intragastric gavage for 15 days.

The arsenic group (n=8) was given 10 mg/kg of sodium arsenite (Sodium metaarsenite, Sigma-Aldrich Sodium metaarsenite >=90% Steinheim, Germany) every day by dissolving it into distilled water through intragastric gavage for 15 days.

The arsenic and melatonin groups (n=8) were given 10 mg/kg of dissolved sodium arsenite and 10 mg/kg of dissolved melatonin (Melatonin, Sigma-Aldrich Melatonin, Solid Steinheim, Germany) in 10% ethyl alcohol through intragastric gavage every day for 15 days.

At the end of the 15-day experiment period, all rat weights were measured, and they were then sacrificed. Blood was drawn from the left ventricle under deep Ketamine (90 mg/kg) and Xylazine (10 mg/kg) anesthesia. For chemical measurements, samples were drawn into gelled vacuum tubes and then centrifuged at 2750 g RCF for 10 minutes in a cool centrifuge. Serums were kept at -80°C until the measurements were taken.

Chemical Measurements

All chemical measurements were performed using the Cobas e6000 (e501, Roche Diagnostics) system with commercial analyses kits. Serum macrophage Migration Inhibitor Factor (MIF) levels were also measured (Rat MIF ELISA; Cusabio Biotech Co. Ltd.). The MCP-1 level was measured using ELISA kits (Rat MCP-1 ELISA; Cusabio Biotech Co. Ltd.). The MIF and MCP-1 minimum measurement levels were 1.6 pg/mL and 1.7 pg/mL, respectively. The ELISA kit (Rat IL-6 Platinum ELISA eBioscience Bender MedSystems GmbH) was used to determine serum IL-6 levels, and the results were expressed in pg/mL.

Statistical Analysis

Statistical Package for the Social Sciences 16.0 software for Windows (SPSS Inc.; Chicago, IL, USA) was used to statistically evaluate the data. A Shapiro-Wilk test was used for group distribution (i.e., homogeneity), a Student's t-test (i.e., for the homogenous group and parametric values), and a Mann-Whitney U test (i.e., for the heterogeneous group and non-parametric values) was used for binary comprehension. A p value <0.05 was accepted as statistically significant. Numerical values were expressed as average ± standard deviation (SD) or median and minimum-maximum values.

RESULTS

When the arsenic group and the control group were compared, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) activities were higher in the arsenic group ($p<0.001$ and $p<0.001$, respectively). Significant decreases were observed in AST and ALT levels in the melatonin group when compared with the arsenic group ($p<0.002$ and $p<0.001$, respectively). There was a significant difference ($p=0.029$) in the albumin level between arsenic and the control groups, while no significant differences were found between the melatonin and the arsenic groups. When the arsenic group and the control group were compared according to Il-6, MIF and monocyte chemotactic protein 1 (MCP-1), the levels were found to be significantly higher in the arsenic group ($p<0.001$, $p<0.001$, and $p<0.001$, respectively). Significant decreases at these levels were found in the melatonin group when compared with the arsenic group ($p<0.001$, $p<0.02$, and $p=0.04$ respectively). All measurement parameters were presented in detail in Figure 1 and Table 1.

DISCUSSION

Oxidative stress plays an important role in liver damage that has been caused by arsenic toxicity. Oxidative stress is defined as imbalances between antioxidant defense mechanisms and the production of free radicals, which cause peroxidation of cell lipid layers. Intracellular and extracellular lipid peroxidation increases cell, tissue, and organ damage. Also, arsenic may

Table 1. Results of biochemical measurements at study and control groups

Group	Control	Arsenic	Melatonin
ALT (IU/L)	18.2±2.4	29.4±3.2[a]	20.6±1.5[c]
AST (IU/L)	109.1±12.9	150.1±22.5[a]	116.1±11.4[d]
Albumin (g/dL)	3.9±0.2	3.7±0.1[b]	3.7±0.2
Total Protein (g/dL)	5.5±0.3	5.7±0.4	5.6±0.3
IL-6 (pg/mL)	12.84 (10.5-13.9)	26.7 (20.1-30.7)[a]	14.9 (13.8-17.1)[c]
MCP-1 (pg/mL)	5.3±0.7	6.7±0.6[a]	5.4±1.0[d]
MIF (pg/mL)	50.7±6.5	74.4±10.8[a]	57.7±6.3[d]

AST: aspartate aminotransferase; ALT: alanine aminotransferase; IL-6: interleukin-6; MCP-1: monocyte chemotactic protein 1; MIF: macrophage migration inhibitor factor
[a]p<0.001 compared with control group. [b]p<0.05 compared with control group. [c]P<0.001 compared with arsenic group. [d]p<0.05 compared with arsenic group.

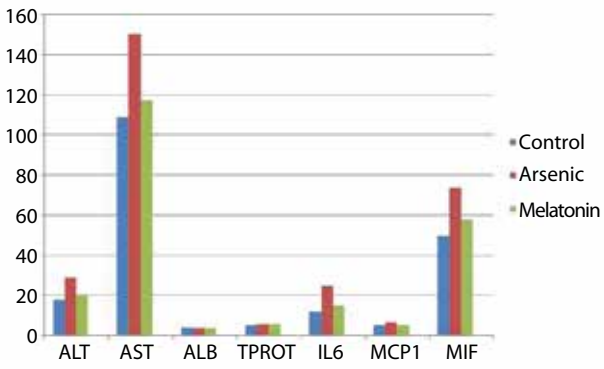

Figure 1. Biochemical measurement results of control, arsenic and melatonin groups
AST: aspartate aminotransferase; ALT: alanine aminotransferase; ALB: albumin; TPROT: total protein

inhibit many enzymes and damage protein structures. The cytokines secreted after cellular damage increases the migration of inflammation to cells and tissues, so the inflammatory period is triggered (27, 28).

The hormone melatonin plays a role in physiological functions like regulating the endocrine system, increasing immune functions, regulating smooth muscle tonus, and repressing gonadal functions (29). It also reportedly regulates interleukin responses, saves cellular structures in the liver, and increases survival through the antioxidant effect (30).

Many researchers reported that melatonin's antioxidant effects can repair liver damage caused by heavy metals and accumulations of toxic materials (30-32). However, its anti-inflammatory effects have not yet been proven. In this study, hepatic enzymes, IL-6, MIF, and MCP-1 were used to evaluate the protective effects of melatonin in livers damaged by arsenic.

Two enzymes in particular, ALT and AST, enable amino group transfer during amino acid metabolism and gluconeogenesis (33, 34). Increases in aminotransferase serum levels are important indicators for acute or chronic liver damage (35). Arsenic reportedly has toxic effects on the liver and chronic exposure can cause different clinical scenarios ranging from liver damage to cancer (36).

It was reported (37-39) that 10-100 mg/kg melatonin application significantly decreased AST and ALT levels that were elevated because of substances like carbon tetrachloride, dimethyl nitrosamine, and acetaminophen that had caused liver toxicity in rats. In our study, AST and ALT levels were higher in rats administered arsenic when compared with the control group. Additionally, applications of 10 mg/kg melatonin caused significant decreases in AST and ALT levels. These findings lead us to believe that melatonin has the effect of repairing liver damage caused by arsenic.

Interleukin-6 (IL-6) is secreted from monocytes, fibroblasts, endothelium cells, and B lymphocytes, but its main secretion source is T lymphocytes, and it basically activates monocytes and macrophages. It is a pro-inflammatory cytokine that stimulates B lymphocyte differentiation and antibody secretion (40). Although melatonin has anti-inflammatory effects, clinical studies about the effects of melatonin on IL-6 are sometimes contradictory. Srinivasan et al. (41) reported that melatonin increases IL-2, IL-6, IL-12, and interferon (IFN) gamma levels by stimulating cytokine production, and that it has an oncostatic effect. Conversely, Broncel et al. (42) reported that melatonin decreases IL-6, IL-12, TNF-alpha, and IFN gamma levels. In our study, IL-6 levels were significantly increased in the arsenic group when compared with the control group. There were significant decreases in the melatonin group when compared with the arsenic group. These findings support the conclusion that melatonin decreases cytokine secretion and exhibits a hepatoprotective effect via an anti-inflammatory mechanism.

Animal studies have determined that arsenic exposure stimulates IL-6, MCP-1, and vascular endothelial growing factor gene expression. It also triggers an inflammatory period where applied alpha lipoic acid decreases proinflammatory molecule levels (43). In another study, arsenic reportedly stimulated production of proinflammatory cytokines, IL-1B, IL-6, MCP-1, and C reactive protein through inducible nitric oxide synthase (iNOS) in the vascular system (27). There are no data in the literature on the effects of melatonin on MCP-1 levels during arsenic toxicity. In our study, MCP-1 levels were lowered with application of melatonin to liver tissues with arsenic toxicity. Also, proinflammatory cytokines were repressed in either the liver or damaged tissues. This lead to the conclusion that melatonin is an important factor for healing.

The MIF is a complex protein showing the properties of an inflammatory cytokine, a neuroendocrine hormone, and an enzyme, while its main effect is decreasing macrophage migration (44). Additionally, MIF exhibits proinflammatory effects by secreting NO and activating the cyclooxygenase pathway as well as by stimulating tumor necrosis factor-alpha, IL-1B, IL-2, IL-6, IL-8, IFN-c, and adhesion molecules (45). Furthermore, MIF neutralization is decreased. According to different animal study models (46, 47), its release increases liver damage caused by alcohol and various toxic substances. Getting MIF levels under control is important in the treatment of many inflammatory diseases. There have been clinical studies on MIF antagonists over the last few years (48). In our study, melatonin significantly decreased MIF levels that had been increased by arsenic exposure. Proinflammatory cytokine release was decreased to address inflammatory damage, and macrophage migration was resolved.

CONCLUSION

This study concerning liver enzymes and inflammatory markers detected that melatonin has therapeutic effects on liver tissues that were damaged by arsenic exposure.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Namık Kemal University.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - İ.B.; Design - İ.B., B.B., M.A.; Supervision - S.E., F.T.; Resources - İ.B., B.B., S.E.; Materials - M.A.; Data Collection and/or Processing - A.Y., T.G.; Analysis and/or Interpretation - İ.B., B.B., S.E., M.A.; Literature Search - İ.B., M.A., A.Y., F.T.; Writing Manuscript - İ.B., M.A.; Critical Review - S.E., B.B., F.T.; Other - A.Y., T.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı Namık Kemal Üniversitesi'nden alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - İ.B.; Tasarım - İ.B., B.B., M.A.; Denetleme - S.E., F.T.; Kaynaklar - İ.B., B.B., S.E.; Malzemeler - M.A.; Veri Toplanması ve/veya İşlemesi - A.Y., T.G.; Analiz ve/veya Yorum - İ.B., B.B., S.E., M.A.; Literatür Taraması - İ.B., M.A., A.Y., F.T.; Yazıyı Yazan - İ.B., M.A.; Eleştirel İnceleme - S.E., B.B., F.T.; Diğer - A.Y., T.G.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 238-243
DOI: 10.5152/UCD.2016.3275

Impact of preoperative body mass index on the final outcome after laparoscopic sleeve gastrectomy for morbid obesity

Ameliyat öncesi vücut kitle indeksinin morbid obezitede laparoskopik sleeve gastrektomi sonuçları üzerine etkisi

Hosam Elbanna, Wagih Ghnnam, Ahmed Negm, Tamer Youssef, Sameh Emile, Tito El Metwally, Khaled Elalfy

ABSTRACT

Objective: Laparoscopic sleeve gastrectomy (LSG) is a popular bariatric surgery due to its excellent results and limited morbidity. Our study aims to assess the efficacy of LSG in terms of loss of weight and co-morbidity improvement and to evaluate the impact of preoperative body mass index (BMI) on the final outcome.

Material and Methods: The data of 173 patients who underwent LSG were analyzed. Laparoscopic sleeve gastrectomy was indicated only for patients with BMI >40. Mean postoperative BMI, co-morbidity improvement, operative data and complications, length of hospital stay and excess weight loss were evaluated and recorded.

Results: This study included 151 females and 22 males with a mean age of 37.6 years. Patients were divided into two groups according to their BMI (group I <50, group II >50). Mean preoperative BMI was 53.8 kg/m^2. Mean operative time was 120 minutes. Mean duration of hospital stay was 3.2 days. Mean postoperative BMI decreased to 47.3 kg/m^2 at 1 year. Excess weight loss was 43.1% at 6 months, 71.1% at 1 year, and 87.5% at 5 years. Group I showed a significantly shorter length of hospital stay, more improvement of laboratory parameters and more reduction in BMI as compared to group II. There was one mortality and six cases had gastric staple line leakage.

Conclusion: Laparoscopic sleeve gastrectomy is an efficient treatment to achieve significant weight loss that is maintained up to 5 years of follow up, also it improves some of the obesity related co-morbidities. This beneficial impact of LSG appears to be significantly higher in patients with BMI <50.

Keywords: Bariatric, morbid obesity, sleeve gastrectomy

ÖZ

Amaç: Laparoskopik sleeve gastrektomi (LSG) mükemmel sonuçları ve kısıtlı morbiditesi nedeniyle yaygın olarak uygulanan bir bariatrik cerrahi yöntemidir. Çalışmamız kilo kaybı ve ko-morbiditede düzelme açısından LSG'nin etkinliğini ölçmeyi ve ameliyat öncesi vücut kitle indeksinin (VKİ) sonuçlar üzerine etkisini değerlendirmeyi amaçlamaktadır.

Gereç ve Yöntemler: Laparoskopik sleeve gastrektomi uygulanan 173 hastanın verileri incelendi. Laparoskopik sleeve gastrektomi, sadece VKİ> 40 olan hastalar için endike kabul edildi. Ameliyat sonrası ortalama VKİ, komorbiditede düzelme, ameliyat verileri ve komplikasyonları, hastanede kalış süresi ve fazla kilo kaybı değerlendirildi ve kaydedildi.

Bulgular: Bu çalışmaya ortalama yaşları 37,6 yıl olan 151 kadın ve 22 erkek dahil edildi. Hastalar VKİ'ne göre iki gruba ayrıldı (<50 grup I, >50 grup II). Ameliyat öncesi ortalama VKİ 53,8 kg/m^2 idi. Ortalama ameliyat süresi 120 dakika, ortalama hastanede kalış süresi 3,2 gün idi. Ortalama ameliyat sonrası VKİ 1. yılda 47,3 kg/m$^{2'}$ye düştü. Fazla kilo kaybı 6 ayda %43,1, 1 yılda %71,1 ve 5 yılda %87,5 idi. Grup I'de grup II'ye kıyasla hastanede kalış süresinin anlamlı derecede daha kısa olduğu, laboratuvar parametrelerinin daha fazla düzeldiği ve VKİ'de daha fazla düşüş olduğu saptandı. Bir olgu mortal seyirli idi ve altı olguda gastrik stapler hattında kaçak gelişti.

Sonuç: Laparoskopik sleeve gastrektomi 5 yıllık takipte sonuçların korunduğu belirgin kilo kaybı sağlayan etkili bir tedavi yöntemidir, aynı zamanda obezite ile ilişkili ko-morbiditelerin bazılarında düzelme sağlar. Laparoskopik sleeve gastrektomininin bu yararlı etkisinin VKİ <50 olan hastalarda anlamlı olarak daha fazla olduğu görülmektedir.

Anahtar Kelimeler: Bariatrik, morbid obezite, sleeve gastrektomi

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Received / *Geliş Tarihi*: 08.07.2015
Accepted / *Kabul Tarihi*: 19.10.2015

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Morbid obesity is one of the most serious health issues worldwide. The prevalence of morbid obesity has increased over the past two decades at a significant rate in such a way that it can be considered a pandemic. According to World Health Organization (WHO) 2.3 billion adults will be overweight by 2015. The prevalence of overweight and obese people among the Egyptian population is increasing. Although no single study has reported the incidence of obesity in Egypt, it is estimated to be around 24%. Co-morbidities associated with morbid obesity include type 2 diabetes (T2DM), ischemic heart diseases, musculo-skeletal disorders, sleep apnea and a higher mortality rate (1-3).

The medical treatment of obesity did not achieve sufficient success to balance the increase in the prevalence of obesity, which in turn led to the emergence of bariatric surgery. Bariatric surgery proved to be the most successful treatment as it achieves long-term weight loss and correction of metabolic abnormalities in patients suffering from morbid obesity (4, 5).

Laparoscopic sleeve gastrectomy (LSG) developed as the first stage of a two - stage duodenal switch procedure. Laparoscopic sleeve gastrectomy involves partial gastrectomy along the lesser curvature leaving a thin tube of gastric tissue connecting the esophagus to the pylorus. The volume of the sleeve is approximately 100 mL over a 32–36 French sized bougie (6). Laparoscopic sleeve gastrectomy gained the attraction of many surgeons as a bariatric operation, being technically easier than gastric bypass, with less malabsorption, less risk of renal calculi and no risk of internal hernia or anastomotic ulcer formation. Operative complication rates and weight loss outcomes in LSG surgery are similar to those of Roux-en-Y gastric bypass (RYGB) (7).

Laparoscopic sleeve gastrectomy has increasingly gained acceptance among bariatric surgeons during the past years. Even high-risk patients underwent a staged procedure with LSG serving as a primary stage before RYGB or biliopancreatic diversion/duodenal switch. Data have shown that LSG is a highly efficient, technically easy and safe bariatric operation that can be used as a stand-alone procedure (8). Although morbidly obese patients are high risk surgical patients, rates of postoperative leaks, bleeding and other complications are low and acceptable (9). Recently LSG is considered the best bariatric surgery in morbidly obese patients (10).

The objective of our study is to evaluate the efficacy of LSG as a mode of surgical management of morbidly obese patients and to investigate the impact of preoperative body mass index (BMI) on the final outcome to determine whether patients with BMI higher than 50 can achieve the same results after LSG as patients with BMI lower than 50 or not.

MATERIAL AND METHODS

In the period from March 2010 to January 2015, 173 morbidly obese patients [22 (12.7%) male patients and 151 (87.3%) females] underwent LSG in the general surgery department at Mansoura University Principal Hospital as well as private hospitals in Mansoura city. The mean age of patients was 37.6±12.4 years. All patients have tried every non-surgical method of weight loss and none of them has undergone any previous bariatric surgery. Patients excluded from this study include those with an extremely high operative risk, major psychologic or endocrinologic conditions, and patients with significant hiatus hernia or Barrett's esophagus.

Preoperative Evaluation

Age, sex and BMI of the patients were recorded. Thorough clinical evaluation including blood pressure, pulmonary and cardiac examinations was done. Laboratory investigations in the form of complete blood count, plasma glucose levels, triglyceride (TG), serum total cholesterol (Tc), and low density lipoprotein (LDL) concentrations were determined as baseline levels. Upper gastrointestinal (GI) endoscopy was routinely performed in all patients in order to exclude significant hiatus hernia and Barrett's esophagus. Informed consent was obtained from all patients included in this study. Patients then were divided according to their preoperative BMI into two groups, group I with BMI <50 and group II with BMI >50.

Surgical Procedure

After induction of general anesthesia, the patient was placed in the supine position. Five port technique was used. The laparoscope was introduced through a supra-umbilical port, two 12 mm ports were placed one on the right and one on the left, 10 cm caudal from the costal margin at midclavicular line, one 5 mm port in the right subcostal margin for the retraction of the liver and 10 mm port in the left subcostal margin. We began de-vascularization of the greater curvature of the stomach with harmonic scalpel (ultrasonic dissector) at about 2 cm proximal to the pylorus and then we proceeded upwards till the angle of His. A linear stapler (Endo GIA) was used with two sequential 4.8/60 mm green load firings from the antrum, followed by two or three sequential 3.5/60 mm blue loads for the remaining gastric body and fundus. After inserting a 36 French calibrating bougie into the stomach, the stapler was applied alongside the bougie. The resected stomach was grasped by a laparoscopic grasper at the tip of the antrum and then retrieved through one of the 12 mm port sites. Any bleeding site was clipped. No supportive materials were added to reinforce the suture line except in case of bleeding suture line, in which overlying sutures were used for hemostatic purpose. An abdominal drain was routinely placed.

Postoperative Course and Follow Up

The nasogastric tube was removed on the first postoperative day. The abdominal drain was removed on the second or the third postoperative day except in cases of gastric leakage, where the drain was kept in place for a longer period as part of conservative management. Patients were discharged on the third postoperative day.

All patients were instructed to take postoperative oral multivitamin supplementation for life and histamine 2 receptor blockers for 6 months. The mean operative time, duration of hospital stay and early postoperative complications were recorded.

Follow up was scheduled at the third, sixth, ninth and twelfth postoperative months in the outpatient clinic in the first year and followed with a visit every year for the next four years. Follow up parameters measured at each visit included body weight, BMI, blood pressure, blood glucose level, hemoglobin A1c (HBA1c), serum TG level, Tc level and LDL.

Statistical Analysis

Data were analyzed using excel and Statistical Package for Social Science (SPSS Inc.; Chicago, IL, USA) programs version 16 under Microsoft Window. Data were summarized using mean and standard deviation (SD). Relative percentage change was calculated to get the actual change in each time measure. Relative percentage change = [(Post measure – Pre measure)] x100. Comparison between groups were done using unpaired Student's t-test for quantitative variables.

RESULTS

One hundred seventy-three patients were included in this study and underwent LSG. Patients were divided according to their preoperative BMI into two subgroups, group I (BMI less than 50) comprised 64 (37%) patients and group II (BMI more than 50) comprised 109 (63%) patients. The preoperative characteristics of the patients are listed in Table 1.

The mean operative time was 120±25.3 minutes (range, 90-180) while the mean postoperative hospital stay was 3.2±1.5 days (range, 3-11days). No intra-operative mortality was reported.

Table 1. Demographic data of the population included in the study

Number of patients	173
Mean age in years±SD (range)	37.6±7.7 (23-58)
Sex (female/male)	151/22
Mean BMI in kg/m^2±SD (range)	53.8±8 (40-75 kg/m^2)
BMI <50 kg/m^2 (%)	64 cases (37%)
BMI >50 kg/m^2 (%)	109 cases (63%)
Mean operative time minutes±SD (range)	120.1±25.3 (90-180)
Mean hospital stay days±SD (range)	3.18±1.5 (3-11)

SD: standard deviation; BMI: Body Mass Index

Table 2. Change in BMI at the first postoperative year

Preoperative	First Postoperative Year	p
53.8±8	47.34±4.4	<0.0001

BMI: Body Mass Index

Table 3. Improvement of co-morbidities after laparoscopic sleeve gastrectomy

Co-morbidities	Improvement assessed at 1 year	Improvement assessed at 3 years	Improvement assessed at 5 years	p
Diabetes (cases)	77% (57 out of 74)	91.8% (68 out of 74)	91.8% (68 out of 74)	0.0217
Hypertension (cases)	78.8% (41 out of 52)	88.5% (46 out of 52)	88.5% (46 out of 52)	0.2888
Dyslipidemia (cases)	86.7% (72 out of 83)	91.5% (76 out of 83)	95.1% (79 out of 83)	0.1017
Musculoskeletal problems (cases)	72.6% (45 out of 62)	87.1% (54 out of 62)	96.8% (60 out of 62)	0.0003
Symptoms of GERD (cases)	39.3% (11 out of 28)	57.1% (16 out of 28)	67.8% (19 out of 28)	0.0598
Sleep apnea (cases)	68.8% (22 out of 32)	84.4% (27 out of 32)	96.9% (31 out of 32)	0.0059
Infertility in females only	44.4% (4 out of 9)	44.4% (4 out of 9)	55.5% (5 out of 9)	1
Urinary incontinence in females only	58.3% (7 out of 12)	75% (9 out of 12)	75% (9 out of 12)	0.6668

GERD: gastroesophageal reflux disease

In terms of postoperative complications, leakage from the site of anastomosis with intra-abdominal collection was noted in six patients, two patients were treated with ultrasound guided drainage, the other two patients were managed conservatively and the last two patients underwent exploratory laparotomy. On the other hand, we did not report other complications such as bleeding or wound- related complications, i.e. infection or herniation.

Gastric dilatation was reported in four patients, two of them were still losing weight and dilatation was not exceeding double the size of remnant, while the other two patients stopped losing weight and even regained weight and eventually re-sleeve was done with good results.

Other complications include postoperative nausea and vomiting in 23 (13.2%) patients who were treated conservatively. Gastro-esophageal reflux disease (GERD) symptoms developed in 17 (9.8%) patients who were treated conservatively. Six (3.4%) patients developed asymptomatic gallbladder stones and were managed conservatively. Two patients developed pulmonary embolism and they were also managed conservatively. There was only one postoperative mortality which occurred at the 8th postoperative day, in a male patient with BMI >50. This mortality was due to massive pulmonary embolism.

Mean preoperative BMI for all patients was 53.8±8 (range, 40-75 kg/m^2) which dropped one year after surgery to 47.34±4.4 (range, 37-56.7 kg/m^2) with a p value less than 0.0001 (Table 2). Mean preoperative HbA1C for all patients was 8.75±1.32 (range, 7.9-11.8%), which declined postoperatively to 6.92±1.7 (range, 6.5-9.4%) ($p<0.05$). Resolution of diabetes was maintained up to five years follow up in 68 (91.8%) patients. Improvement of the obesity associated co-morbidities over the study period is illustrated in Table 3.

Both group I and group II had co-morbidities related to obesity such as diabetes, hypertension, hyperlipidemia, infertility and urinary stress incontinence in females. There was no significant difference between the two groups in terms of operative time(Table 4), yet group I showed significant reduction of BMI at five years postoperatively, significantly shorter hospital stay and significant improvement of laboratory parameters as serum Tc, LDL, TG level and blood glucose level ($p<0.05$).

Table 5 illustrates the overall changes in the laboratory parameters, body weight and BMI in the immediate postoperative period and over 5 years of follow-up. As demonstrated, BMI showed a remarkable drop from 53.8 preoperative to 33.1 five years after surgery. Also, TG, blood glucose, HBA1c, and LDL have declined over five years postoperatively, reflecting an improvement in terms of diabetes and dyslipidemia.

DISCUSSION

Laparoscopic sleeve gastrectomy exerts its weight-losing effect by reducing the capacity of the stomach to less than 100 mL, which induces early satiety sensation during eating. Another mechanism for weight loss is the decrease in serum levels of ghrelin and leptin. Since intestinal bypass is not performed in LSG; anemia, vitamin deficiencies, protein malnutrition or osteoporosis are not encountered. The absence of dumping syndrome is another advantage of LSG.

Laparoscopic sleeve gastrectomy is categorized as a restrictive bariatric procedure; however, LSG is also a metabolic procedure due to the changes in gut hormones induced by the operation in addition to the caloric restriction effect thus leading to an important role in the field of bariatric surgery (11, 12).

Previous studies have shown that bariatric surgery causes significant weight loss and is more effective than non-surgical interventions. Not only does LSG achieve the greatest weight loss in the first few months after the operation, but also this weight loss is sustained for a long time reaching up to 20 years, with far less mortality rate than that obtained with diet regimen, exercise programs, and medications (4).

Table 4. Comparing the two groups regarding BMI and comorbidity improvement

Parameter	Group I BMI <50 (n=64)	Group II BMI >50 (n=109)	p
Mean age	36.98±5.2	37.98±5.4	0.23
Sex			
Male (%)	9 (14%)	13 (11.9%)	
Female (%)	55 (86%)	96 (88.1%)	0.42
Operative time (Minutes)	124.29±35.2	117.66±34.4	0.22
Mean hospital stay (Days)	2.79±1.35	3.41±1.43	0.005
Mean preoperative cholesterol	305.87±40.1	309.22±43.2	0.61
Mean postoperative cholesterol at 5years	217.5±22	210.3±26	0.06
Mean preoperative triglyceride	242.04±98.7	228.32±99.3	0.38
Mean postoperative triglyceride at 5 years	172.73±3.1	171.42±4.8	0.05
Mean preoperative LDL	214.82±62.8	222.44±65.9	0.46
Mean postoperative LDL at 5 years	151.67±34.2	139.94±32.1	0.02
Mean preoperative RBG	198.67±75.8	192.08±71.8	0.57
Mean postoperative RBG at 5 years	108.42±37.9	105.77±36.4	0.64
Mean preoperative body weight	143.48±44.8	167.85±51.6	0.002
Mean postoperative body weight at 5 years	82.15±2.1	81.82±2.5	0.07
Mean preoperative BMI	46.8±8.2	60.8±8.8	<0.0001
Mean postoperative BMI at 5 years	29.7±4.3	36.5±5.1	<0.0001

BMI: Body Mass Index; LDL: low density lipoprotein; RBG: random blood glucose

Table 5. Overall changes in the laboratory parameters, body weight and BMI over the study period

	Preoperative	6 months Postoperative	1 year Postoperative	5 years Postoperative
BMI	53.8±8	43.1±4.9	47.3±4.4	33.1±2.7
Total cholesterol	308±41.8	280.9±37.6	264.3±32.5	213±24.4
Triglyceride	233.4±99.1	203.9±60.3	192.7±22.4	171.9±4.2
LDL	219.6±63.7	150.6±44.2	151.6±44.7	144.2±33.8
Blood glucose (mg %)	194.5±73.7	170.7±54.8	163.3±47.2	106.7±37.3
HBA1c	8.75±3.2	6.92±2.7	6.85±2.5	5.75±1.8
Body weight (kg)	158.8±48.4	120.2±22.6	117.6±18.2	82±2.3

BMI: Body Mass Index; HBA1c: hemoglobin A1c; kg: kilogram; mg: milligram; LDL: low density lipoprotein

A systematic review of 36 studies recently evaluated overall weight loss after sleeve gastrectomy and assessed reduction of weight for both staged and primary patient groups (7). The mean preoperative BMI for all patients included in the systematic review was 51.2 kg/m^2 which decreased to 37.1 kg/m^2 during three years of follow-up. This is comparable to our results, as in our study the mean preoperative BMI for all patients was 53.8±8 (range 40-75 kg/m^2) and decreased to 47.34 ±4.4 range (37-56.7 kg/m^2) at one year after surgery and progressively declined to 33.1±2.8 at 5 years postoperatively. The overall mean excess weight loss (EWL) after sleeve gastrectomy as reported in 24 studies was 55.4% (range, 33%-85%) that was comparable to our findings of EWL of 55.6% (7).

Laparoscopic sleeve gastrectomy is associated with a significant improvement of T2DM and other obesity-associated co-morbidities such as hypertension and hyperlipidemia (13, 14). Postoperative improvement of diabetes starts even before significant weight loss has occurred. The mechanism for this rapid metabolic improvement is not fully understood and it may be independent of weight loss. This implies that bariatric surgery is also a metabolic procedure that improves metabolic conditions even in non-obese patients (15). Varying degrees of diabetes remission has been reported after each current bariatric procedure.

A recent review by Gill et al. (16) evaluated the rate of improvement in diabetes after sleeve gastrectomy, and identified 28 studies that met their inclusion criteria. This systematic review included 673 patients with a mean preoperative BMI of 47.4 kg/m^2, which is less than the mean preoperative BMI in our study (53 kg/m^2). In their review, LSG resulted in diabetes remission in 66.2% of patients. In eleven studies that included HbA1c as a measure of glucose control, the mean HbA1c decreased from 7.9% to 6.2%. In our study, a significant resolution of diabetes mellitus was detected in 77% of patients at one year and reached up to 91% at 5 years postoperatively while HbA1c decreased from 8.75% to 5.75%. The effect is caused by a decrease in insulin resistance due to weight loss and caloric restriction rather than an increased insulin secretion (17).

A decline in the serum levels of Tc, TG and LDL is noted after surgery while high-density lipids increase. However, the improvement in dyslipidemia in our study was not statistically significant. Resolution of dyslipidemia, T2DM and blood pressure would definitely improve the Framingham risk score for cardiac events (18).

Review of the literature revealed improvement of dyslipidemia in 70%, hypertension in 62%, arthralgia in 77%, ischemic heart diseases in 56%, and sleep apnea in 86% of patients. Excellent improvement of infertility and of urinary incontinence in females have also been reported in the literature, which contradicts our results as the improvement of both infertility and incontinence in females was not significant, possibly due to the small number of patients with both conditions (19, 20).

The overall mortality rate through 30 days in the published literature is 0.19% (13). There was only one mortality in our study due to massive pulmonary embolism that occurred on the 8th postoperative day. Nevertheless, our mortality rate was 0.57%, which is apparently high due to the limited number of cases in the study group.

Sleeve gastrectomy is associated with acceptable perioperative morbidity and it offers a rapid and effective treatment for

morbid obese patients (21). The main concern with LSG mentioned by various authors is the possibility of dilatation of the gastric sleeve that occurred in 4 patients (2.3%) in our study with the consequence of weight regain in two of them (1.15%). However, gastric dilatation was not proved to be an etiology for inappropriate weight loss (22), and even if it occurred laparoscopic re-sleeve gastrectomy can be performed easily and safely in the setting of gastric tube dilation or inadequate original gastric volume reduction.

Gastric leak is one of the most serious and dreaded complications of LSG. It occurs in up to 5% of patients following LSG (23). In our study leakage from staple line with intra-abdominal collection was seen in six patients (3.4%), which is within the acceptable range.

Gastro-esophageal reflux disease remains a concern after sleeve gastrectomy and the onset of severe refractory GERD after LSG maybe an indication to revise the procedure to gastric bypass. Often early improvement of GERD symptoms occurs after LSG (24) but late onset of GERD symptoms has also been reported. In the report by Himpens et al. (25), the overall incidence of new-onset GERD (defined as symptoms requiring proton pump inhibitor use) was 26%, which is higher than our incidence rate of 9.8%. A neo-fundus (dilated pouch of fundus at the proximal sleeve) is probably the cause of the new-onset GERD symptoms and it occasionally requires reoperation. GERD symptoms improved in patients who had their dilated fundus resected. Additionally, in the study by Bohdjalian et al. (26), 31% of patients were on chronic therapy for acid suppression for GERD symptom after 5 years of follow-up.

Classifying patients into two groups according to their preoperative BMI, those lower or higher than 50, revealed that while the operative time held no significant difference, the mean hospital stay was significantly shorter in the first group and also the improvement of laboratory parameters, body weight reduction and decline in BMI at 5 years postoperatively were in favor of the first group. This might imply that the lower the preoperative BMI, the better are the results obtained by bariatric surgery and LSG in particular. This finding is concordant with the study by Ochner et al. (27) reporting that the effect of preoperative BMI was apparent, heavier individuals showed lower percentages of initial and excess weight loss, and that this effect was particularly apparent after the initial rapid weight loss phase during the first year, when patients with BMI <50 continued losing weight, while patients with BMI ≥50 regained significant weight. Another cohort study reported significant weight loss and improvement of T2DM, hypertension and dyslipidemia after LSG in 78 patients whose BMI was less than 50 (28).

CONCLUSION

Laparoscopic sleeve gastrectomy provides satisfactory weight loss and reduction of BMI with simultaneous improvement of obesity related co-morbidities. The therapeutic effect of LSG is more significantly observed in patients with BMI less than 50. This observation implies that the preoperative BMI has a strong impact on the final outcome of the procedure, patients with BMI more than 50 may not achieve the same good results as patients with a lower BMI, and thus other alternatives such as mini gastric bypass can be their ultimate solution.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Mansoura University School of Medicine.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – H.E.; Design – H.E.; Supervision – H.E.; Data Collection and/or Processing – H.E., W.G., A.N., T.Y., S.E.; Analysis and/or Interpretation – W.G., A.N., T.Y., S.E.; Literature Search – W.G., A.N., T.Y., S.E.; Writing Manuscript – H.E., W.G., A.N., T.Y., S.E., T.E.M., H.Elafy; Critical Review – H.E., W.G., A.N., T.Y., S.E., T.E.M., H.Elafy.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı Mansoura Üniversitesi Tıp Fakültesi'nden alınmıştır.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – H.E.; Tasarım – H.E.; Denetleme – H.E.; Veri Toplanması ve/veya İşlemesi – H.E., W.G., A.N., T.Y., S.E.; Analiz ve/veya Yorum – W.G., A.N., T.Y., S.E.; Literatür Taraması – W.G., A.N., T.Y., S.E.; Yazıyı Yazan – H.E., W.G., A.N., T.Y., S.E., T.E.M., H.Elafy; Eleştirel İnceleme – H.E., W.G., A.N., T.Y., S.E., T.E.M., H.Elafy.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 244-247
DOI: 10.5152/UCD.2016.3251

Extralevator abdominoperineal excision versus conventional surgery for low rectal cancer: a single surgeon experience

Alt yerleşimli rektal kanserlerde ekstralevator abdominoperineal eksizyon ile klasik cerrahinin karşılaştırılması: Tek cerrah deneyimi

Gürel Neşşar[1], Ali Eba Demirbağ[1], Bahadır Celep[2], Orhan Hayri Elbir[1], Cüneyt Kayaalp[3]

ABSTRACT

Objective: Extralevator abdominoperineal excision (ELAPE) reduces the risk of positive circumferential resection margin (CRM) and of intraoperative perforation (IOP), both of which are associated with high local recurrence rates and poor survival outcomes for rectal cancer. The aim of this study was to compare the results of ELAPE with conventional abdominoperineal excision (APE) for low rectal cancer.

Material and Methods: A total of 25 consecutive patients underwent ELAPE for low rectal cancer between November 2008 and September 2011. Fifty-six patients treated by conventional APE prior to 2008 were selected from our rectal cancer database for comparison as a historical cohort.

Results: The mean follow-up was 44.7 months in the ELAPE group, and 70.6 months in the APE group. Patients undergoing ELAPE had a lower CRM positivity and IOP rate than APE (12% vs. 20%, p=0,531; 4% vs. 8,9%, p=0,826; respectively). The ELAPE group was associated with higher perineal wound complications than the APE group (16.0% vs. 1.8%, p=0.030). Local recurrence rates for patients in both groups did not differ significantly (4.0% vs. 3.6%, p=1.0).

Conclusion: The results of this study suggest that ELAPE technique was associated with less CRM involvement and reduced rates of IOP but markedly higher rates of postoperative perineal complications occurred as compared to conventional surgery. ELAPE must be reserved for advanced low rectal cancers.

Keywords: Extralevator abdominoperineal excision, margin involvement, perforation, rectal cancer

ÖZ

Amaç: Ekstralevator abdominoperineal eksizyon (ELAPE), rektal kanserde yüksek oranda lokal nüks ve kötü sağkalım sonuçlarına yol açan radyal sınır tutulumu (RST) ve intraoperatif perforasyon (İOP) riskini azaltır. Bu çalışmanın amacı rektum kanserinde ELAPE ile klasik abdominoperineal eksizyonu (APE) karşılaştırmaktır.

Gereç ve Yöntemler: Kasım 2008 ile Eylül 2011 arasında rektum kanseri nedeniyle 25 ardışık hastaya ELAPE yapıldı. 2008 yılından önce klasik APE yapılan 56 hastanın kayıtları karşılaştırma amacıyla seçildi.

Bulgular: Ortalama takip süresi ELAPE grubunda 44,7 ay, APE grubunda 70,6 aydı. ELAPE yapılan hastalarda APE yapılan hastalara göre daha az RST ve İOP görüldü (sırasıyla, %12 ve %20, p=0,531; %4 ve %8,9, p=0,826). Perine yara komplikasyonları ELAPE grubunda APE grubuna göre daha yüksekti (%16,0 ve %1,8, p=0,030). Her iki grup arasında lokal nüks yönünden anlamlı fark yoktu (%4 ve %3,6, p=1,0).

Sonuç: Bu çalışmanın sonuçlarına göre ELAPE tekniğinde klasik cerrahiye göre daha az RST ve İOP görülmekte ancak postoperatif perine komplikasyonları belirgin olarak artmaktadır. ELAPE tekniği ileri evre alt rektum kanserlerinde kullanılmalıdır.

Anahtar Kelimeler: Ekstralevator abdominoperineal eksizyon, sınır tutulumu, perforasyon, rektum kanseri

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Received / *Geliş Tarihi*: 19.06.2015
Accepted / *Kabul Tarihi*: 30.08.2015

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

As originally described by Miles (1), abdominoperineal excision (APE) has long been the standard treatment for tumors of the middle and lower rectum. It achieves the greatest possible distal margin of resection by removing the anus in continuity with the rectum. Total mesorectal excision (TME), recommended by Heald et al. (2), has led to a decrease in perineal amputation numbers and has become the oncologic standard in the last 30 years. However, the rates of circumferential resection margin (CRM) positivity and of intraoperative perforation (IOP) is higher in abdominoperineal excision as compared to anterior excision. Recently, Holm's studies have generated a renewed interest on the abdominoperineal excision technique (3). In this operation, the levator muscles are excised from their origins on the pelvic side walls and removed en bloc with the tumor. The aim of this approach is to reduce both the rate of CRM positivity and IOP, which are associated with high rates of local recurrence and poor survival outcomes in patients with rectal cancer (4-8). Although there are many similarities between what Miles has previously described and what Holm recently defined, there are major differences that should be recognized e.g. Miles did not use the prone position and did not undertake a total mesorectal excision. This study was designed to compare the results of extralevator abdominoperineal excision (ELAPE) with the conventional APE approach.

MATERIAL AND METHODS

Patients

Between November 2008 and December 2011, 25 patients with low rectal cancer underwent ELAPE in the prone jack-knife position. Nine patients (36.0%) received neoadjuvant long-term chemoradiotherapy. A consecutive series of 56 patients that were treated by conventional APE in the lithotomy position between 2003 and 2008 were selected from our prospectively collected rectal cancer database for comparison as a historical cohort. Eight of these patients (14.3%) had received neoadjuvant chemoradiotherapy. Chemoradiation indication was defined as T3-4/N+ tumors for both group of patients. Surgeries were performed at 6 to 8 weeks after neoadjuvant therapy. Low rectal cancer was defined as tumors in the lower third of the rectum. Digital rectal examination, plain chest x-ray, colonoscopy, abdominal ultrasonography, and computerized tomography were used for staging both before and after chemoradiotherapy. All operations were performed by the same consultant surgeon who had undergone additional training on the extralevator technique. All patients were followed up prospectively. Patient informed consent was obtained for the operation presented in the study. Our study has been conducted according to World Medical Association (WMA) Declaration of Helsinki Ethical Principals for Medical Research.

Table 1. Patient and tumor characteristics (n=81)

Variable	Type of Resection ELAPE	APE	p
Gender (M/F)	25 (17/8)	56 (37/19)	0.865
Age (yr) Mean+SD	60.3+13.5	56.8+14.1	
Median (Range)	58 (40-85)	57 (27-84)	0.293
BMI Mean+SD	26.7+4.7	26.6+4.9	0.952
Tumor Stage			
I	3 (12.0)	13 (23.2)	0.217
II	12 (48.0)	14 (25.0)	
III	9 (36.0)	26 (46.4)	
IV	1 (4.0)	3 (5.4)	
Differentiation			
Well	6 (24.0)	23 (41.1)	0.114
Moderate	16 (64.0)	19 (33.9)	
Poor	-	3 (5.4)	
Muscinous	3 (12.0)	9 (16.1)	
Missing Data	-	2 (3.6)	
Intraoperative perforation	1 (4.0)	5 (8.9)	0.826
CRM (+)	3 (12.0)	11 (20.0)	0.531
Operation time (minutes, Mean+SD)	**301.5+45.5**	**213.7+63.3**	**<0.001**
Median (Range)	**300 (240-420)**	**210(90-400)**	
EBL (mL) Mean+SD	276.1+156.6	289.1+162.6	0.876
Neoadjuvant CRT	**9 (36.0)**	**6 (14.3)**	**0.012**
Perineal wound complication	**4 (16.0)**	**1 (1.8)**	**0.030**
Local recurrence	4%	3.6%	1.0
Follow-up (months, Mean+SD)	44.7+23.5	70.6+34.3	-
Median (Range)	46(1-74)	78(2-141)	

ELAPE: Extralevator abdominoperineal excision; APE: abdominoperineal excision; BMI: body mass index; CRM: circumferential resection margin; CRT: chemoradiotherapy; EBL: estimated blood loss. Figures in the parentheses depict percentages.

Statistical Analysis

Data was coded and recorded digitally using an IBM Statistical Package for the Social Sciences (IBM SPSS Statistics; Armonk, NY, USA) on Windows version 17.0.0. The chi-square and Fisher's exact tests were used to compare the groups in terms of

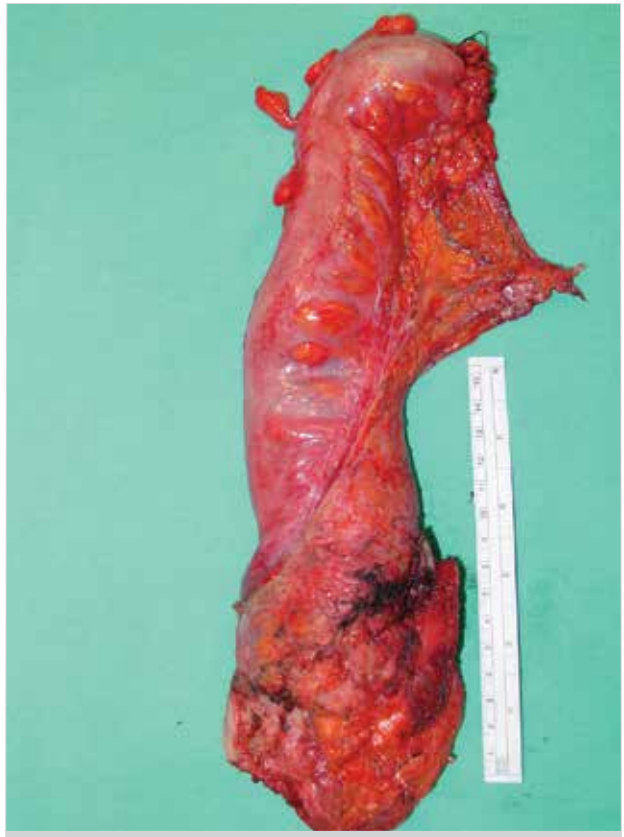

Figure 1. Surgical photograph of an extralevator abdominoperineal excision specimen

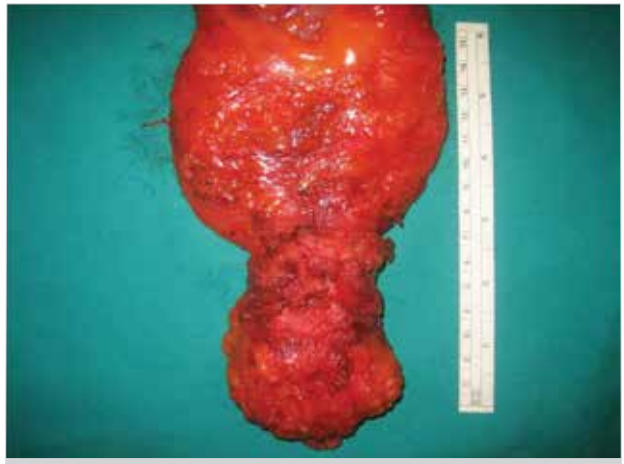

Figure 2. The surgical waist of the conventional abdominoperineal excision specimen

sex, stage, tumor differentiation, perforation, circumferential margin, neoadjuvant therapy, perineal wound complications, and local recurrence rates between the ELAPE and APE groups. Student's t tests and Mann-Whitney U tests were used to compare age, BMI, operation times, and estimated blood loss. p values <0.05 were accepted as statistically significant for each test.

RESULTS

Patient and tumor characteristics are summarized in Table 1 categorized as early and late results. The mean follow-up was 44.7 months in the ELAPE group and 69.8 months in the standard group. There were no significant differences between the two groups in terms of sex, tumor stage and grade, mean age, BMI and follow-up duration. Patients undergoing ELAPE had a lower incidence of CRM involvement and reduced IOP rates compared to those that underwent APE (12% vs. 20%, p=0.531; 4.0% vs. 8.9%, p=0.826). Local recurrence rates in both groups did not differ significantly (4.0% vs. 3.6%, p=1.0).

The ELAPE surgery was associated with an increase in perineal wound complications as compared with the standard approach (16.0% vs. 1.8%, p=0.03). Most of the perineal morbidities were infections and suture breakdowns. Preoperative radiotherapy was used more frequently (36.0% vs. 14.3%, p=0.012), and the operation times were substantially longer for the ELAPE approach than APE (301.5±45.5 minutes vs. 213.7±63.3 minutes, p<0.001). There was no in-hospital mortality in either group.

DISCUSSION

In the group of 25 patients who underwent ELAPE for low rectal cancer, both CRM positivity and IOP rates were lower than patients who underwent APE, although neither result was statistically significant. This trend could be explained by the fact that the levator muscles are excised from their origin on the pelvic side walls, which creates a cylindrically shaped specimen (Figure 1). Therefore, a surgical waist no longer exists on the specimen at the level of the tumor in contrast to the APE technique (Figure 2). A comparison of this technique with APE was published recently (9), which reported that CRM positivity decreased from 40.6% to 14.8%, and the incidence of IOP reduced from 22.8% to 3.7%; both of these results were statistically significant. In another multicenter study, a reduction was found in the ELAPE group as compared to standard surgery for both CRM positivity (49.6% vs. 20.3%; p<0.001) and IOP (28.2% vs. 8.2%; p<0.001) (10). Two meta-analyses revealed that the use of ELAPE produces lower rates of CRM positivity, IOP and local recurrence and that therefore ELAPE demonstrated oncological superiority over APE (11, 12). However, only one randomized, controlled trial has shown improved local recurrence rates with ELAPE (13). The results from this current study reveal that the ELAPE technique has superiority over APE in terms of CRM positivity and IOP rates, but that the differences between the two techniques is not statistically different. This could be explained by the low number of patients in each group.

In our study, local recurrence rates were 4% for ELAPE and 3.6% for APE groups. Although patients in the APE group had lower rates of chemoradiation than those in the ELAPE group, there was no difference between the groups in terms of local recurrence rates. The major advantage with ELAPE, where one might expect to see an improvement in local recurrence and survival, is for advanced low tumors in which staying in the conventional plane will be unsafe and potentially lead to cutting through the tumor. For smaller tumors, ELAPE could cause unnecessary morbidity with no potential oncological gain. Similarly, for tumors that have responded well to neoadjuvant chemoradiation, oncological benefit to ELAPE is unlikely while morbidity will markedly increase.

The prone jack-knife position gives an excellent view for the perineal stage of the ELAPE technique. For the first time, it is possible to view the detailed anatomy of the male reproductive system during the perineal phase of the operation. This gives the opportunity to perform an optimal dissection between the embryological planes, which may decrease inadvertent bowel perforations. West et al. (10) showed that the perforation rate with ELAPE was lower using the prone jack-knife position than the lithotomy position (6% vs. 20%, p=0.027). However, other studies showed that the position of the patient was not important if the surgery is performed by a suitably trained surgeon (14, 15).

All perineal wound defects were closed primarily. Perineal wound complications occurred significantly more frequently in the ELAPE group, which may have been related to the higher rate of neoadjuvant chemoradiotherapy in the ELAPE group (16, 17). Longer operation times may also be an important factor for perineal morbidity in these patients. Pelvic floor reconstruction using various techniques has been advocated to decrease perineal morbidity (10, 18, 19). However, all of these techniques are time consuming and necessitate plastic surgery consultation.

Study Limitations

The study was limited by low number of patients in each group and its non-randomized design. Furthermore, data on APE was collected retrospectively from a historical cohort. However, we believe that it is important to analyze the results of the experience of a single surgeon, as this eliminates surgeon-related variables, such as their training level and the different patient numbers managed by different physicians (20).

CONCLUSION

The results of this study suggest that ELAPE technique was associated with less CRM positivity and reduced rates of IOP, but significantly higher rates of postoperative perineal complications occurred as compared to conventional surgery. ELAPE must be reserved for advanced low rectal cancers.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – G.N.; Design – G.N., A.E.D.; Supervision – C.K.; Resources – G.N., A.E.D.; Materials – G.N., A.E.D., B.C., O.H.E.; Data Collection and/or Processing – G.N., A.E.D., B.C.; Analysis and/or Interpretation – G.N., A.E.D., C.K.; Literature Search – G.N., A.E.D.; Writing Manuscript – G.N., A.E.D.; Critical Review – G.N., A.E.D., B.C., O.H.E., C.K.; Other – G.N.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Yazarlar çalışmanın World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013) prensiplerine uygun olarak yapıldığını beyan etmişlerdir.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – G.N.; Tasarım – G.N., A.E.D.; Denetleme – C.K.; Kaynaklar – G.N., A.E.D.; Malzemeler – G.N., A.E.D., B.C., O.H.E.; Veri Toplanması ve/veya İşlemesi – G.N., A.E.D., B.C.; Analiz ve/veya Yorum – G.N., A.E.D., C.K.; Literatür Taraması – G.N., A.E.D.; Yazıyı Yazan – G.N., A.E.D.; Eleştirel İnceleme – G.N., A.E.D., B.C., O.H.E., C.K.; Diğer – G.N.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 248-251
DOI: 10.5152/UCD.2016.3174

Can isolated pancreaticojejunostomy reduce pancreas fistula after pancreaticoduodenectomy with Roux-en-Y reconstruction?

Roux-en-Y rekonstrüksiyonlu pankreatikoduodenektomi sonrası izole pankreatikojejunostomi pankreas fistülünü azaltabilir mi?

Hasan Erdem[1], Süleyman Çetinkünar[1], Mehmet Aziret[1], Enver Reyhan[2], Alper Sözütek[2], Selim Sözen[3], Oktay İrkorucu[1]

ABSTRACT

Objective: Pancreaticoduodenectomy is a surgical procedure which is commonly accepted in cases of ampulla of Vater, head of pancreas, distal common bile duct neoplasms and severe chronic pancreatitis. Pancreatic fistula is still a serious problem after reconstruction. Yet, there is no consensus on a single reconstruction method.

Material and Methods: The reconstruction methods on patients who had pancreaticoduodenectomy due to pancreatic tumor, and results of these reconstruction methods were retrospectively analyzed. Anastomosis was performed on all patients in the form of Roux-en-Y, but they varied as follows; Type 1: Only pancreatic anastomosis to the Y limb, Type 2: Pancreas and hepatic canal anastomosis together to the Y limb.

Results: 31 patients participated in the study. 21 of them were male, and 10 were female. In our study, postoperative complications included pancreatic fistula, hemorrhage, abscess, wound site infection, and pulmonary infection. Although more complications were observed in group 2 than in group 1, there was no statistically significant difference. There was one mortality in each group.

Conclusion: In our opinion, one of the reasons of leakage is that anastomosis of both the biliary and pancreatic ducts to the same loop increases anastomotic pressure due to the raised output thus leading to fistula formation. A limitation of our study was the low number of patients. Reconstruction of the pancreas and bile secretions through separate anastomosis may reduce the rate of pancreatic fistulas.

Keywords: Fistula, pancreatic cancer, pancreaticoduodenectomy

ÖZ

Amaç: Pankreatikoduodenektomi ampulla Vateri, pankreas başı, distal koledok tümörleri ve bazı kronik pankreatit olgularında yaygın kabul gören cerrahi prosedürdür. Rekonstrüksiyon sonrası pankreatik fistül halen ciddi bir problemdir. Rekonstrüksiyon yöntemleri hususunda üzerinde fikir birliği sağlanmış bir yöntem henüz yoktur.

Gereç ve Yöntemler: Pankreas tümörü nedeniyle pankreatikoduodenektomi uygulanan hastalarda yapılan rekonstrüksiyon yöntemleri ve sonuçları retrospektif olarak araştırılmıştır. Tüm hastalardaki anastomoz Roux-en-Y şeklinde yapılmış olup birbirinden farkları ise şöyledir; Tip 1: Y bacağı ile sadece pankreatik anastomoz, Tip 2: Y bacağı ile pankreas ve hepatik kanal anastomozu birlikte yapılmıştır.

Bulgular: Çalışmaya 31 hasta dahil edilmiştir. Hastaların 21'i erkek, 10'u kadındı. Çalışmamızda pankreatik fistül, kanama, abse, yara yeri enfeksiyonu ve akciğer enfeksiyonu postoperatif dönemde gözlenen komplikasyonlardı. Her ne kadar grup 2'de komplikasyonların sayısı grup 1'e kıyasla daha fazla gözlense de istatistiksel olarak anlamlı fark tespit edilmedi. Mortalite her iki grupta da birer hastada gelişti.

Sonuç: Kaçağın sebeplerinden birinin aynı ans üzerine yapılan pankreas ve safra kanalı anastomozlarının birlikte debiyi yükseltmesi ve anastomoz basıncını arttırarak fistül oluşumuna neden olması olduğunu düşünüyoruz. Çalışmamızın dezavantajı ise hasta sayısının az olmasıdır. Pankreatik sıvı ile safranın ayrı anastomozlarla rekonstüksiyonu kronik pankreatik fistülleri azaltabilir.

Anahtar Kelimeler: Postoperatif fistül, pankreas, pankreatikoduodenektomi

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Received / *Geliş Tarihi*: 26.04.2015
Accepted / *Kabul Tarihi*: 10.07.2015

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Pancreaticoduodenectomy (PD) is a surgical procedure that is commonly accepted in cases of malignant and benign diseases of the pancreas and periampullary region. Due to the developments in perioperative patient care and operative techniques, mortality and morbidity observed in PD cases have decreased gradually in recent years (1, 2). Operative mortality has fallen to 1% in broad series. Postoperative pancreatic fistula (POPF) is definitely the most important complication of PD, being the most important reason of perioperative mortality and morbidity (3, 4). Pancreaticojejunostomy is the weakest point of reconstruction, both due to the consistency of pancreatic tissue and the frequency of fistulas of this anastomosis (1, 5, 6). Conventional reconstructions include performing hepaticojejunostomy and gastrojejunostomy on the same loop together with an end-to-end or end-to-side pancreaticojejunostomy. In cases of pancreatic leakages, dangerous and high-output fistulas can be observed if bile juice and stomach content are included in the pancreatic leakage as a result of the proximity of pancreas and hepatic canal anastomosis (7). It is considered that mixing of the pancreatic enzymes and bile juice and

stomach content delays in methods of Roux-en-Y reconstruction (RYR) and isolated pancreatic drainage, thus pancreatic fistulas and mortality and morbidity based on them may be decreased, therefore these methods have been preferred increasingly in the last years (8).

MATERIAL AND METHODS

In this study, our objective is to provide information on whether isolated pancreaticojejunostomy decreases POPF rates or not in Roux-en-Y reconstructions performed after PD in General Surgery Clinic of Adana Numune Training and Research Hospital, as well as the technical details of the procedure.

The reconstruction methods applied on patients who underwent PD between March 2011 and December 2013 were retrospectively analyzed. In our clinic, all patients with a periampullary tumor are subjected to classic Whipple operation. Reconstruction was performed on all patients in the form of Roux-en-Y anastomosis, but they varied as follows; Type 1: Only pancreatic anastomosis to the Y limb, Type 2: Pancreas and hepatic canal anastomosis together to the Y limb (Figure 1, 2).

Demographic characteristics, preoperative comorbidities, operation and postoperative follow-up findings, complications, and histopathological findings of the patients were recorded.

'International Study Group of Pancreatic Fistula Classification' was used to diagnose postoperative POPF in our clinic. The temporary and asymptomatic fistulas that have been diagnosed only by drain amylase level were regarded as Grade A, whereas symptomatic fistulas with clinically notable fever, stomach ache and peripancreatic fluid were regarded as Grade B. Fistulas that caused relevant symptoms and required aggressive treatment were regarded as Grade C. All treatment strategies were determined based on this classification.

Statistical Analysis

Statistical analysis was conducted by using Statistical Package for the Social Sciences 16 (SPSS Inc.; Chicago, IL, USA). Variables were presented as median (min-max). Continuous variables were evaluated by Student's t test. On the other hand, nonparametric variables were analyzed with chi-square method by applying Fischer's exact test.

RESULTS

Our study group consisted of 31 patients, 21 M/10 F, with a median age of 61. Any statistically significant difference with regard to age and gender distribution was not determined between the groups (p=0.148 and p=0.617, respectively). The most frequent tumor localization was found to be the head of the pancreas in both groups (9 (60%) in Group 1, and 7 (43%) in Group 2). The number of patients with tumors of the ampulla of Vater, duodenum and distal bile duct were 2, 1, and 3 in group 1; and 5, 1, and 3 in group 2, respectively. Any statistically significant difference with regard to tumor localization was not determined between the groups. In addition, there was no statistically significant difference with regard to tumor sizes between the groups. The tumor sizes of group 1 and group 2 were determined as 3 (0.3-4) cm and 3.5 (0.8-4) cm, respectively (p=0.454). Adenocarcinoma was the most frequent histopathologic tumor type for both groups (group 1=10 patients, group 2=14 patients). Other histopathologic type of tumors included neuroendocrine tumors (group 1=3 patients), stromal tumor (group 2=2 patients) and mucinous cystic neoplasm (group 1=2 patients). However, any statistically significant difference with regard to histopathologic analysis was not detected between the groups. Postoperative pancreatic fistula was determined in 4 patients in total including 1 patient from group 1 and 3 patients from group 2. There was no statistically significant difference with regard to postoperative pancreatic fistula development between the groups (p=0.596). In our study; hemorrhage, abscess, wound site infection, and pulmonary infection were the complications observed in the postoperative period. Although the number of the complications in group 2 was higher as compared to group 1, a statistically significant difference was not determined. There was one mortality in each group. Demographic data, tumor localization, tumor size, histopathologic examination, postoperative complications and mortality rates of the patients are summarized in Table 1.

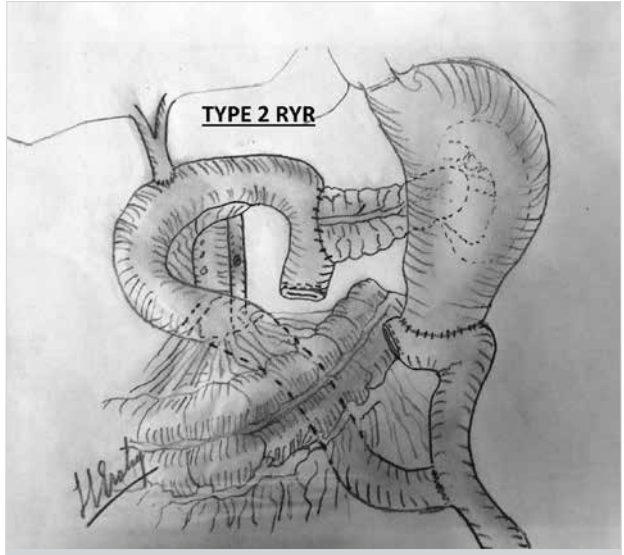

Figure 1. Classical Roux-en-Y reconstruction

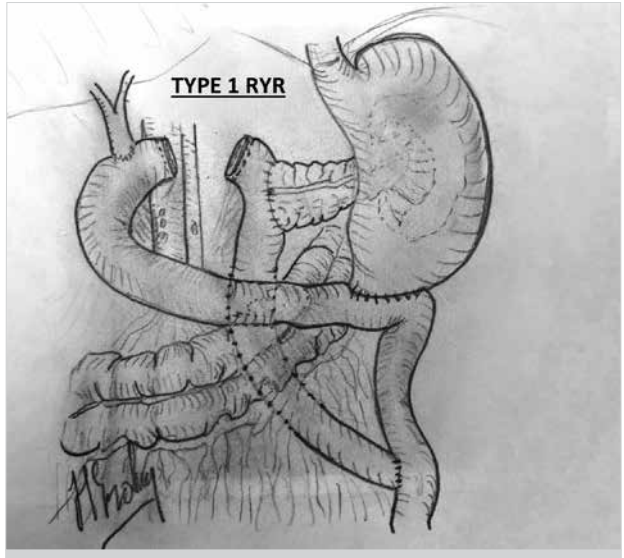

Figure 2. Isolated pancreatic loop reconstruction

DISCUSSION

Even though mortality and morbidity rates have declined significantly since Whipple et al. (7) first described PD technique, the complications after pancreas surgery are still difficult to cope with both for the patients and the surgeons (5, 8-10). Postoperative mortality rate that had exceeded 25% in the 1960's has declined to below 5% nowadays in surgical centers performing specific pancreas surgery (5, 6, 11). The decline in mortality rate after pancreatic resection is attributed to the advancements in operative techniques, developments in perioperative care, and the increasing utility of endoscopic and percutaneous interventions. On the other hand, morbidity rates still correspond to 30-40% in broad series (11, 12). The most frequently observed specific complications after PD are anastomotic leakages, pancreas fistula, hemorrhage and delayed gastric emptying. Particularly, postoperative POPF is one of the major reasons of mortality and morbidity after PD (13-15). The predictive factors for pancreatic leakage and fistula development can be listed as a small sized duct, consistency of the pancreatic tissue, requirement for extended resections, drain localization, quantity of intraoperative blood loss and obesity (14, 16). Perhaps, the most significant ones among these are pancreatic anatomy and operative techniques (11, 17).

Table 1. Demographic and clinical outcomes in two groups

	Group 1 (n=15)	Group 2 (n=16)	p
Age (min-max)/mean	(47-85)/62	(46-82)/60	NS
Gender (M/F)	9/6	12/4	NS
Tumor localization			
Head of pancreas	9 (60%)	7 (43%)	NS
Ampulla of Vater	2 (13%)	5 (31%)	
Duodenum	1 (6%)	1 (6%)	
Distal bile duct	3 (20%)	3 (18%)	
Tumor size	3 (0.3-4)	3,5 (0.8-4)	0.454
Operation time (hour)	6 (4-7)	5 (4-6)	0.376
Histopathological classification			
Adenocarcinoma	10 (66%)	14 (87%)	NS
Neuroendocrine tumor	3 (20%)	0 (0%)	
Stromal tumor	0 (0%)	2 (12%)	
Mucinous cystic neoplasm	2 (13%)	0 (0%)	
Complication			
POPF	1 (6%)	3 (18%)	0.596
Pulmonary infection	3 (20%)	4 (25%)	NS
Hemorrhage	0 (0%)	3 (18%)	0.221
Intra-abdominal abscess	0 (0%)	2 (12%)	0.483
Wound site infection	3 (0%)	8 (50%)	0.135
Mortality	1 (6%)	1 (6%)	NS

F: female; M: male; POPF: postoperative pancreatic fistula; NS: not significant

Numerous reconstruction methods have been applied to reduce POPF risk (13, 18-21). It is stated that RYRs were more effective than conventional loop reconstructions in recent years, and that fistula-related complications were decreased by this method. The objective of RYR is enabling the contents of bile and pancreatic juice to encounter with gastric content later (22-24).

Another modification of RYRs is the one which is performed in the form of isolated pancreatic anastomosis. It was firstly described by Machado et al. (24) in 1976. In this study, fistula developed in 2 out of 15 patients, and both patients did not experience mortality. Kingsnorth et al. (23) mentioned that pancreatic fistula was not seen in a series of 52 cases when isolated Roux loop method was applied (23). Similarly, Funovics et al. (22) compared 4 different reconstruction methods in their study and reported that isolated pancreatic anastomosis technique yielded the optimum result. Another study conducted by Kaman et al. (13) showed that isolated Roux loop method did not reduce POPF rate.

One of the most comprehensive studies about RYR isolated pancreatic anastomosis technique is a multicenter prospective randomized study conducted by Ke et al. (21). In this study, Ke et al. compared conventional loop reconstruction (CLR) technique with RYR-isolated pancreatic anastomosis technique and they determined that isolated pancreatic anastomosis technique decreased fistula-related complications although it did not reduce pancreatic fistula rate (Table 2).

The objective of isolated pancreatic anastomosis is to prevent bile and intestinal content from mixing with the pancreatic content in anastomotic regions, since bile reflux in pancreatic region is one of the main reasons of especially pancreatitis and relevant leakage and sepsis (13, 22, 24).

All reconstructions in our clinical experiment were performed in form of RYR. We think that even the pancreatic anastomosis should be separated from biliary anastomosis in order to reduce pancreatic fistula rate and the relevant complications

Table 2. POPF cases, clinical management

Fistula Patient No	Anastomosis type	Fistula Grade3	Symptom	Treatment	Result
1	RYR-isolated PJ	A	Asymptomatic	Conservative	Recovery
2	RYR	A	Asymptomatic	Conservative	Recovery
3	RYR	B	Intra-abdominal abscess	Percutaneous drainage	Recovery
4	RYR	B	Peritonitis	Re-laparotomy	Postoperative discharged on day 10

RYR: roux-en-Y reconstruction; PJ: pancreaticojejunostomy; POPF: postoperative pancreatic fistula; NS: not significant

by means of RYR. In the literature, it is known that RYR isolated pancreatic anastomosis technique has many advantages. The most important advantage is preventing destruction of the biliary and gastric anastomosis through the isolation of pancreatic anastomosis. Another advantage is that in case of adequate drainage, oral intake is maintained despite the pancreatic fistula.

CONCLUSION

Although the limited number of patients created a disadvantage in our study, no difference was determined between the two groups in terms of complications.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Adana Numune Training and Research Hospital.

Informed Consent: Written informed consent could not be obtained from the patients because it was a retrospective study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – H.E., S.Ç., O.İ.; Design – E.R.; Supervision – O.İ., E.R.; Resources – A.S., S.S.; Materials – H.E.; Data Collection and/or Processing – H.E., M.A.; Analysis and/or Interpretation – H.E., A.S., O.İ.; Literature Search – S.S.; Writing Manuscript – H.E.; Critical Review – S.S., O.İ., H.E.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı Adana Numune Eğitim ve Araştırma Hastanesi'nden alınmıştır.

Hasta Onamı: Retrospektif bir çalışma olması nedeniyle hasta onamı alınamamıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – H.E., S.Ç., O.İ.; Tasarım – E.R.; Denetleme – O.İ., E.R.; Kaynaklar – A.S., S.S.; Malzemeler – H.E.; Veri Toplanması ve/veya İşlemesi – H.E., M.A.; Analiz ve/veya Yorum – H.E., A.S., O.İ.; Literatür Taraması – S.S.; Yazıyı Yazan – H.E.; Eleştirel İnceleme – S.S., O.İ., H.E.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 252-255
DOI: 10.5152/UCD.2016.2797

Estimation of the capacity of emergency surgery in Konya: Nine-year multicenter study

Konya'da acil cerrahi kapasitesinin tahmini: Dokuz yıllık çok merkezli çalışma

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ABSTRACT

Objective: Although the number of surgical emergencies continues to increase, comprehensive data on emergency surgical admissions are scarce. The aim of this multicenter study was to evaluate the causes, management, and outcomes of the general surgical emergencies in the city of Konya, Turkey.

Material and Methods: The relevant details of the cases admitted and considered to be general surgical emergencies in Konya over a nine-year period (January 2003–January 2012) were analyzed. All demographic data were analyzed statistically.

Results: The study group comprised 21954 cases from 4 hospitals in Konya: 7154 from Konya Numune Hospital, 6,654 from Konya Education and Research Hospital, 6,400 from Necmettin Erbakan University Meram Medical Faculty, and 1,390 from Başkent University Konya Education and Research Hospital. Their mean age was 59.6 years, and the average hospitalization time was 3.3 days. The diagnoses of the admitted patients were as follows: acute appendicitis (59.57%), bowel obstruction (11.12%), trauma (7.97%), strangulated inguinal hernia (5.46%), acute cholecystitis (4.87%), peptic ulcer perforation (4.09%), mesenteric ischemia (2.73%), necrotizing fasciitis (2.73%), gastrointestinal system bleeding (1.79%), and others (1.1%).

Conclusion: The findings of the study indicate a steady increase in surgical admissions to emergency units. Nontraumatic acute abdomen was the most common reason for general surgical emergencies. Although the number of elderly patients increased, the hospital stay and mortality rates decreased over the study period.

Keywords: Emergency, hospitalization, surgery

ÖZ

Amaç: Cerrahi acillerin sayısının sürekli artmasına rağmen acil cerrahi yatışları hakkında kısıtlı veri bulunmaktadır. Bu çok merkezli çalışmanın amacı, Konya şehrinde acil genel cerrahi sonuçlarını değerlendirmektir.

Gereç ve Yöntemler: Konya'da tüm genel cerrahi acil başvurularının dokuz yıllık sonuçları incelendi (Ocak 2003-Ocak 2012). Tüm demografik veriler istatistiksel olarak değerlendirildi.

Bulgular: Konya'da yer alan 4 hastaneden 21954 hasta çalışmaya alınmıştır. Konya Numune Hastanesi (7154), Konya Eğitim ve Araştırma Hastanesi (6654), Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi (6400) ve Başkent Üniversitesi Konya Eğitim ve Araştırma Hastanesi (1390) verileri toplandı. Hastaların yaş ortalaması 59,6 ve ortalama hastanede kalış süresi 3,3 gündü. Hastaneye kabul edilen hastaların tanıları; akut apandisit (%59,57), bağırsak tıkanıklığı (%11,12), travma (%7,97), boğulmuş kasık fıtığı (%5,46), akut kolesistit (%4,87), peptik ülser perforasyonu (%4,09), mezenterik iskemi (%2,73), nekrotizan fasiit (%2,73), gastrointestinal sistem kanaması (%1,79) ve diğerleriydi (%1,1).

Sonuç: Bu çalışma ile cerrahi kabullerin sürekli arttığı görülmüştür. Non-travmatik akut karın, genel cerrahi acillerinin en sık nedeniydi. Yaşlı hastaların sayısında artış olmasına rağmen, hastanede kalış süresi ve mortalite oranları azalmıştır.

Anahtar Kelimeler: Acil, hastaneye yatış, cerrahi

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Received / *Geliş Tarihi*: 23.02.2015
Accepted / *Kabul Tarihi*: 20.06.2015
Available Online Date / *Çevrimiçi Yayın Tarihi*: 27.10.2016

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Emergencies requiring surgical intervention are increasing steadily worldwide; yet, comprehensive data on emergency surgical admissions are scarce. Despite the fact that such emergencies have similar patterns throughout the world, they may differ from one hospital to another (1). A statistical analysis of the clinical workload has gained impetus for reasons such as widespread medical audits, the need to assess the causes, management, and outcomes of general surgical emergencies, and the need to understand patient demographic and population-based profiles. Although surgical emergencies are an essential part of a hospital's workload, reports regarding the increase in emergency unit admissions (2) are either related to overall or medical admissions (3, 4).

The study by Chezian et al. (5) also reported an increase in emergency admissions between 1992 and 1999; however, the cases referred to surgery were beyond the scope of their study. Likewise, to the best of our knowledge, such cases have not been the subject of any report or have been documented after a long-term study. Increases in the aging population, social deprivation, and awareness are associated with the increase in emergency admission rates (2-4).

The aim of the present multicenter study was to assess the general surgical emergency causes, their management, and outcomes in the city of Konya, Turkey.

MATERIAL AND METHODS

Surgical emergency admissions covering a nine-year period (January 2003-January 2012) were analyzed retrospectively. Hereby, the data obtained from the four participating hospitals- Konya Numune Hospital, Konya Training and Research Hospital, Necmettin Erbakan University Meram School of Medicine, and Başkent University Konya Training and Research Hospital-were analyzed.

All patients included in this study presented to the emergency service and were hospitalized in a general surgery clinic in Konya. Information on the work carried out was obtained from records of the monthly meetings held in Konya that have been regularly carried out for 15 years to discuss emergency cases. Data regarding patient evaluation, number of hospitalized patients, as well as age, diagnosis, and length of hospital stay were included in the study. The information was collected in accordance with the Declaration of Helsinki.

Statistical Analysis

Statistical analyses were performed using the Statistical Package for the Social Sciences 22.0 (IBM Corp.; Armonk, NY, USA) software package.

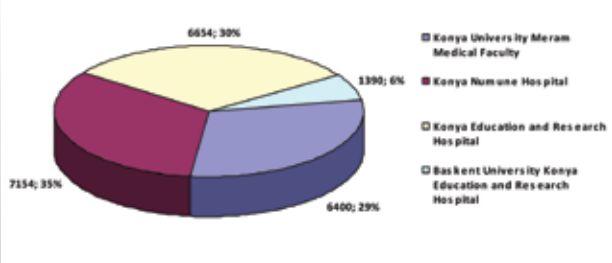

Figure 1. Patient demographic data

RESULTS

In total, 21,954 patients were included from the 4 participating hospitals in Konya: 7,154 from Konya Numune Hospital, 6,654 from Konya Training and Research Hospital, 6,400 from Necmettin Erbakan University Meram School of Medicine, and 1,390 from Başkent University Konya Training and Research Hospital (Figure 1).

Admission rates were higher among the elderly at Necmettin Erbakan University Meram School of Medicine as compared to other centers. The majority of the patients admitted were male, and were residents of Konya (77.7%). The participants' mean age was 59.6 years, with a mean hospital length of stay of 3.3 days. The mean delay from the beginning of the symptoms until presentation to the emergency service was 2.1 days. The diagnoses of the admitted patients were as follows: acute appendicitis (59.57%), bowel obstruction (11.12%), trauma (7.97%), strangulated inguinal hernia (5.46%), acute cholecystitis (4.87%), peptic ulcer perforation (4.09%), mesenteric ischemia (2.73%), necrotizing fasciitis (2.73%), gastrointestinal system (GIS) bleeding (1.79%), and others (1.1%) (Figure 2a-d).

The mean age of the patients admitted to the university hospital emergency clinics was higher than in the other hospitals. Most patients admitted to all four hospitals were diagnosed as having appendicitis, but in the university hospitals, the ratio of appendicitis was lower than that of other hospitals. In contrast, most of the complicated cases (75%) were admitted to the university hospitals.

While the number of open cholecystectomies for acute cholecystitis was higher in the first few years of this study, with the increase in the laparoscopic cholecystectomy rate and surgeon experience, this rate dropped in the latter few years. Likewise, for gastrointestinal bleeding requiring surgical intervention, with advancements in medical treatment, the need for surgery significantly decreased. According to this data, patients with diseases that have high morbidity and mortality rates and re-

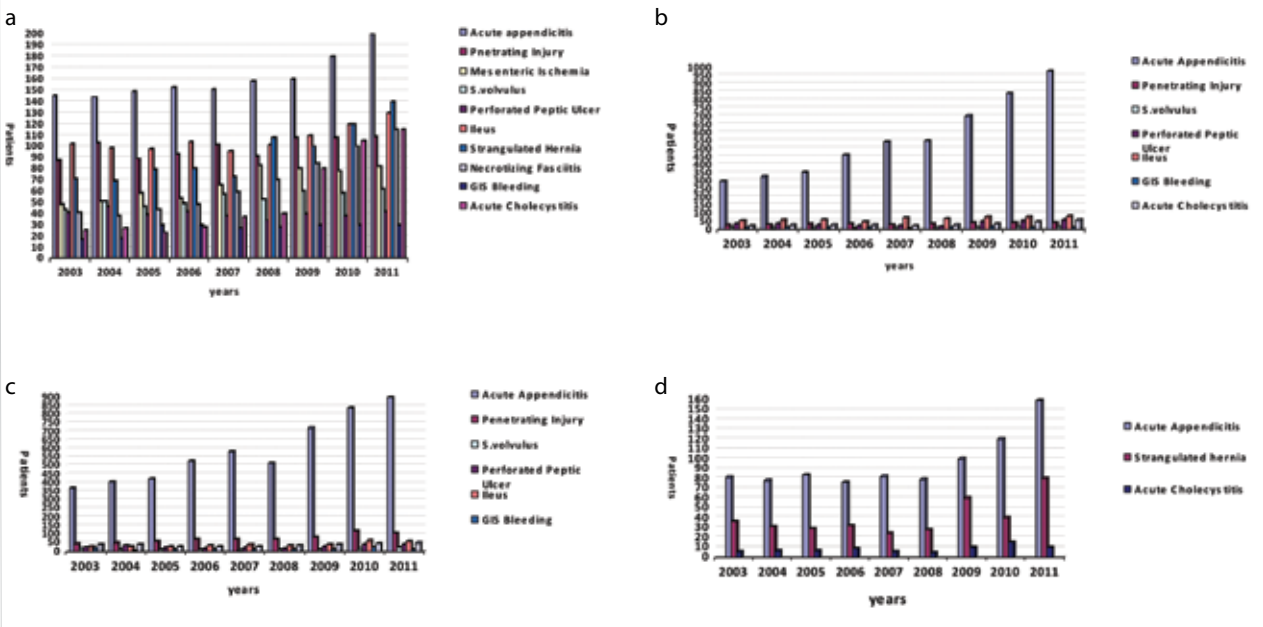

Figure 2. a-d. (a) Emergency Surgical admissions in Necmettin Erbakan University Meram Medical Faculty. (b) Emergency Surgical admissions in Konya Education and Research Hospital. (c) Emergency Surgical Admissions in Konya Numune Hospital. (d) Emergency Surgical Admissions in Baskent University Konya Training and Research Hospital

quire longer hospital care and follow-up, such as necrotizing fasciitis and mesenteric ischemia, were only accepted to university hospitals. While the average age of the patients admitted to the university hospitals increased, the average hospital stay decreased as a result of advancements in postoperative care, equipment, and medication.

DISCUSSION

The progressive increase in the number of emergency surgical admissions and decreasing length of hospital stay shown in this study were in line with other recent reports on the overall tendencies in emergency units (2). These might be attributed partially to the increasing population and partially to the rapid increase in the elderly population specifically (6, 7). However, these are not the only reasons for the increase. Currently, people are presenting to emergency units more. This might be the underlying reason for the steady increase in the high number of abdominal pain and constipation cases in the emergency units. Moreover, to some extent, a particular number of emergency admissions are re-admissions (perhaps due to early discharge from the hospital). However, these cases are outside the scope of this study. The increasing number of emergency unit admissions did not result in an apparent need for more surgical beds, contrary to the observations made by Chezian et al. (5). Nevertheless, the increased workload in the emergency wards has brought about increased nursing, medical, and auxiliary staff needs. Bagust et al. (8) highlighted the extra empty-bed capacity needed for effective emergency unit admission management. The roots of the perceived crises within the health care system are attributed to these important considerations.

In a recent study, acute appendicitis was the most common surgical emergency (1, 9). This finding is in concordance with reports from different parts of the world with different patient series, including pregnant women. However, Anyanwu et al. (10) reported in their 1999 study conducted at the University of Ilorin Teaching Hospital, Nigeria, that superficial skin trauma was the most frequent reason for emergency surgery, followed by intestinal obstruction and appendicitis. In the present study, while appendicitis was the most frequent surgical emergency in non-university hospitals, more complicated cases, such as ileus, penetrating injuries, mesenteric ischemia, and necrotizing fasciitis were mostly admitted to the university hospitals.

Furthermore, a patient's age was an important determinant of the frequency and outcome of abdominal surgical emergencies. In the elderly with severe systemic disorders, abdominal emergency surgery can be a life-threatening condition, and hence requires a more careful evaluation as compared to younger patients. Although the number of elderly patients admitted increased between 2003 and 2012, the total number of beds occupied by elderly patients actually decreased due to shorter hospital stay. However, it would be difficult to shorten the average hospital stay any further. In this study, the mean hospital stay was 3.3 days, while it was 5.5 days in the elderly (i.e., over 70 years of age).

In our experience, the mortality rate increase in elderly patients can be attributed to perioperative risks, delay in surgical treatment, conditions that only permit palliative surgery, comorbidities, higher American Society of Anesthesiologists (ASA) grading, age above 80 years, colorectal surgery, malignant diseases, and the severity of the surgical condition.

As reported above, strangulated hernia ranked high among surgical emergencies, with a rate of 10-25% (11-14). In the present study, its frequency was 15% in university hospitals. Most of the patients were aware of the presence of an external hernia long before they became aware of the strangulation. Elective surgical management of abdominal hernia at a convenient time could prevent development of emergencies in most hernia cases. In the present study, the rate of bowel necrosis was low.

Furthermore, advanced age is an important factor contributing to the frequency of intricate malignant neoplasm. Advanced age contributes to the high mortality in free perforations into the peritoneal cavity and abdominal sepsis (6, 15). Mechanical obstructions had a significant part in this study. According to a recent report, the frequency of intestinal obstruction ranged from 15-20% of total surgical emergencies, most of them due to postoperative adhesions. In line with the findings of the present study, obstructive malignancies were reported as an age-related pathology.

In addition, geographical location had a significant effect on large bowel obstruction in this study. Compared to the elderly Western population, volvulus is the leading cause of large bowel obstruction in Turkey. In particular, cardiovascular disorders may lead to mesenteric vascular occlusion that may lead to a surgical emergency (16). The frequency of acute mesenteric ischemia was less than 10% in the present study, similar to other recent reports. Its clinical course and outcomes are more destructive than any other abdominal emergency.

In the present study, vascular occlusion related bowel necrosis ranked the highest among surgical emergencies. The surgical intervention for mesenteric vascular occlusion related bowel necrosis is limited and rarely successful. The findings of Mamode et al. (17) were in line with ours reporting 81% mortality.

Acute gastrointestinal hemorrhage necessitating a surgical intervention has severe consequences, depending on concomitant diseases. Although its frequency is rare, the mortality rate in surgically treated gastrointestinal hemorrhage is the highest as compared to other surgical emergencies. The prognosis of upper gastrointestinal hemorrhage was less evident pronounced in patients with serious comorbidities, with a mortality rate reaching up to 22.4% (6). An increase in operations for biliary and diverticular disease was reported in several studies related to emergency wards (18, 19). Regardless of age, acute calculous cholecystitis is the most common surgery in relation to biliary diseases. In line with the current literature, the present study determined that peptic ulcer complications are now fewer, due to the presence of more effective medical therapies.

CONCLUSION

- The present study documented a steady increase in emergency unit surgical admissions.
- Non-traumatic acute abdomen was the most common reason for general surgery admissions.
- Appendectomy was the most frequent operation in state hospitals.
- Mesenteric ischemia was the most fatal emergency.

Ethics Committee Approval: Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - A.T.; Design - M.Ç.; Supervision - A.K.; Resources - T.K.; Materials - B.E.; Data Collection and/or Processing - E.T.; Analysis and/or Interpretation - M.B.; Literature Search - M.B.; Writing Manuscript - M.Ç.; Critical Review - M.Ç.

Acknowledgements: We would like to express Dr Adnan Kaynak for his contributions and Dr. Harun Şimşek for his English review.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Yazarlar çalışmanın World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013) prensiplerine uygun olarak yapıldığını beyan etmişlerdir.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - A.T.; Tasarım - M.Ç.; Denetleme - A.K.; Kaynaklar - T.K.; Malzemeler - B.E.; Veri Toplanması ve/veya İşlemesi - E.T.; Analiz ve/veya Yorum - M.B.; Literatür Taraması - M.B.; Yazıyı Yazan - M.Ç.; Eleştirel İnceleme - M.Ç.

Teşekkür: Uzman katkılarından dolayı Dr. Adnan Kaynak ve İngilizce düzeltmelerden dolayı Dr. Harun Şimşek'e teşekkür etmek istiyoruz.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 256-260
DOI: 10.5152/UCD.2016.3196

Why scientists perform animal experiments, scientific or personal aim?

Neden hayvan deneyi yapılıyor, bilimsel amaçlarla mı kişisel amaçlarla mı?

Burhan Mayir, Uğur Doğan, Tuna Bilecik, Erdem Can Yardımcı, Tuğrul Çakır, Arif Aslaner, Yeliz Akpınar Mayir, Mehmet Tahir Oruç

ABSTRACT

Objective: Although all animal studies are conducted in line with a specific purpose, we think that not all animal studies are performed for a scientific purpose but for personal curiosity or to fulfill a requirement. The aim of the present study is to reveal the purposes of experimental studies conducted on animals.

Matherial and Methods: We searched for experimental studies performed on rats in general surgery clinics via PubMed, and obtained the e-mail addresses of the corresponding authors for each study. Afterwards, we sent a 7-item questionnaire to the authors and awaited their responses.

Results: Seventy-three (22.2%) of 329 authors responded to the questionnaire. Within these studies, 31 (42.5%) were conducted as part of a dissertation, while the remaining 19 (26.0%) were conducted to meet the academic promotion criteria. Only 23 (31.5%) were conducted for scientific purposes. The cost of 41% of those studies was higher than 2500 $.

Conclusion: As shown in this study, the main objective of carrying out animal studies in Turkey is usually to prepare a dissertation or to be entitled to academic promotion. Animal experiments must be planned and performed as scientific studies to support related clinical studies. Additionally, animal studies must have well-defined objectives and be carried out in line with scientific purposes that may lead to useful developments in medicine, rather than personal interests.

Keywords: Animal experiment, experimental study, ethics, general surgery

ÖZ

Amaç: Hayvan üzerinde yapılan deneysel çalışmalar belli bir amaç için yapılmakla birlikte, bu çalışmaların hepsinin bilimsel bir amaçla değil, kişisel amaçlarla yapıldığını düşünüyoruz. Bu çalışmanın amacı hayvan üzerinde yapılan deneysel çalışmaların hangi amaçla yapıldığını ortaya koymaktır.

Gereç ve Yöntemler: PubMed üzerinden genel cerrahi alanında ratlar üzerinde yapılmış çalışmalar bulundu. Çalışmaların sorumlu yazarlarına 7 soruluk bir anket göndererek sonuçlarını değerlendirdik.

Bulgular: Üç yüz yirmi dokuz yazarın 73'ü (%22,2) anketi cevapladı. Tüm çalışmaların 31'i (%42,5) tez yapma amacıyla, 19'u (%26,0) ise akademik yükselme kriterlerini sağlamak için yapıldı. Sadece 23 (%31,5) çalışma bilimsel amaçlarla yapılmıştı. Çalışmaların %41'inde maliyet 2500 $ üzerinde idi.

Sonuç: Çalışma sonuçlarına göre Türkiye'de hayvan üzerinde yapılan çalışmaların çoğu tez yapımı ya da akademik yükselme kriterlerini sağlamak için kişisel sebeplerle yapılmaktadır. Hayvan üzerinde yapılan çalışmalar bilimsel bir çalışma olarak planlanmalı ve klinik çalışmalarla desteklenmelidir. Hayvan üzerinde yapılan çalışmalar kişisel amaçlarla değil, bilimsel amaçlarla yapılmalıdır.

Anahtar Kelimeler: Hayvan çalışmaları, deneysel çalışma, etik, genel cerrahi

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Received / *Geliş Tarihi*: 09.05.2015
Accepted / *Kabul Tarihi*: 10.06.2015
Available Online Date / *Çevrimiçi Yayın Tarihi*: 27.10.2016

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INTRODUCTION

It has long been known that the very first animal experiments were conducted 2500 years ago. Galen, who used live goats and dogs for his researches in the second century, became known as the 'Father of Vivisection'. Animal testing has played an important role in the development of Medicine: Insulin, some anti-cancer drugs, modern anesthetics, tetanus vaccine and other vaccines are some of the medications that have been discovered thanks to direct and indirect outcomes of animal testing (1). Some surgical procedures including transplantation, and even space research, have been conducted with animals for the first time. Furthermore, scientists have benefited from animal experimentation in the development of specific imaging methods, such as computed tomography and magnetic resonance imaging. However, while animal studies are becoming increasingly popular, there are some ethical concerns associated with the use of animals in experiments. In 1959, Russell and Burch introduced a principle regarding animal experimentation, which is known as the 3R principle (replacement, reduction and refinement) (2). This principle suggested Replacement: using non-animal methods such as tissue cultures, tissue slices, perfused organs, and computer simulations for experiments, Reduction: using methods that can reduce the number of the animals used, and Refinement: using methods that may improve animal welfare, being sensitive about analgesia, anesthesia and other significant issues, and minimizing invasive procedures. In addition to the 3R principles, many other regulatory and restrictive laws were suggested to

regulate animal testing. Recently, People for the Ethical Treatment of Animals (PETA) and many other similar organizations have started questioning the necessity of animal studies (3, 4).

Despite attitudes towards animal testing and advances in technology for development of alternative methods instead of animal testing, animal studies are still frequently performed. It is estimated that approximately 100 million animals are used for experimentations each year all over the world (5, 6). A total of about 12.1 million animals have been used in Europe in the year 2005, according to report of the European Commission (7). One of the earlier studies concerning this issue reported that 1286 animal studies were carried out in Turkey in 2006 and 455692 animals were used in those studies (5). According to the search we conducted via PubMed, almost 1000 animal studies conducted just on rats were published in Turkey in 2013.

Although all animal studies are conducted in line with a specific purpose, all animal studies had not been published, and not all animal studies were done for a scientific purpose but for personal curiosity or because of necessity. The aim of the present study is to reveal the purposes of experimental studies conducted on animals.

MATERIAL AND METHODS

Using the keywords "Turkey", "rat", and "general surgery", we searched for and found experimental studies performed on rats in general surgery clinics. By analyzing the studies published between March 2006 and March 2014, we obtained the e-mail addresses of the corresponding authors for each study. Afterwards, we sent a 7-item questionnaire to the authors and waited for their responses (Appendix-1).

Statistical Analysis

The questionnaire-based data were recorded and then analyzed with the Statistical Package for Social Sciences (SPSS Inc.; Chicago, IL, USA) for windows 16.0 program. The chi-square test was employed for analyzing. $P<0.05$ was considered statistically significant.

RESULTS

The number of published studies between 2006 and 2014, and complying with the aforementioned criteria was 340 in total. However, only 329 corresponding authors could be reached via e-mail. 73 (22.2%) of those authors responded to the questionnaire. While 54 (74%) of the analyzed studies were conducted in university hospitals, 19 (26%) took place in training and research hospitals. Figure 1 shows the academic titles of the researchers who participated in these studies.

Of all those studies, 31 (42.5%) were conducted as part of a dissertation, while the remaining 19 (26.0%) were conducted to meet the academic promotion criteria. The rate of published dissertation studies was higher in training and research hospitals in comparison to university hospitals; however, the difference was not significant (p=0.260). Objectives of the studies are indicated in Table 1.

Nineteen (61.3%) of those 31 dissertation studies did not have any purpose other than completing specialization in medicine. Similarly, 7 (36.8%) of those 19 dissertation studies that were carried out to satisfy the academic promotion criteria just pursued the goal of getting a promotion.

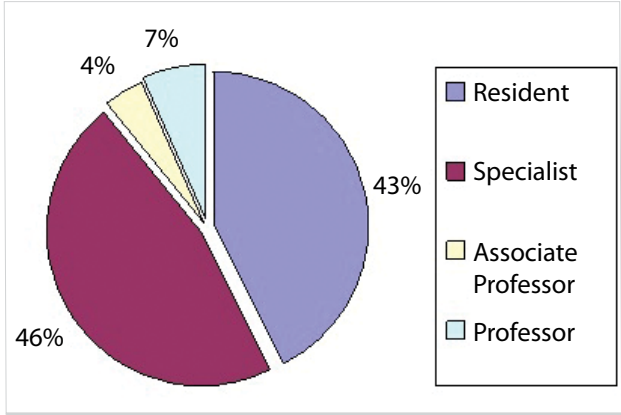

Figure 1. Academic titles of the researchers

Table 1. The objectives of animal studies

Purposes	n	%
To write a dissertation	31	42.5
To provide a sufficient number of publications required for promotion to associate professorship/professorship	19	26.0
To carry out further experiments related to my/our former studies	23	31.5
To carry out new studies in my field of interest	28	38.4
To have information on a field that I have not researched before	8	11.0

Table 2. The factors taken into consideration when planning a scientific research

Factors	n	%
Ease of conducting	21	28.8
Whether it would be the first study or not	46	63.0
Whether it could yield significant results or not	38	52.1
Presence of several similar studies	2	2.7
Whether it could contribute to former relevant international studies	27	37.0
Whether it could contribute to author's further studies on her/his field of interest or to her/his earlier studies	21	28.8
Publication potential	32	43.8

The cost was more than 2500 $ in 41% of studies. The rate of studies that cost more than 2500 $ was higher for the studies carried out at university hospitals (p=0.009). However, when the cost was compared between studies grouped according to their objectives, it was similar for all studies regardless whether they were conducted for dissertation, academic promotion or other purposes (p=0.548).

The factors considered while identifying the study subject can be listed as follows: The significance of the study-whether it would be the first study on the matter, the success potential-whether it could yield a favorable result or not, and the potential for publication (Table 2). When those factors were considered, there was no statistically significant difference between

the studies, which were carried out respectively for dissertations, academic promotion and for other specific purposes.

While 59 (80.8%) of all studies were submitted for publication by the person who conducted the study, 8 (11.0%) of them were submitted by secondary parties participating in the study, and 6 (8.2%) were submitted by thesis advisors. 18 (58.1%) of dissertation studies, 18 (94.7%) of those which were performed to fulfill academic promotion criteria, and all the other theses were published by the researchers conducting the studies. The rate of publication by the physician who conducted the study showed a significant difference between the three groups (p=0.001).

DISCUSSION

Experimental studies conducted on animals are mainly used for the following types of research (in order of frequency): Pharmaceutical research, vaccines, biological research, cancer studies, and toxicology studies (2). Besides those areas, animal experimentation may be also conducted while analyzing physiological mechanisms and with the aim of training and education. Animal studies offer some advantages. They can be performed with a smaller number of subjects and lower budgets as compared to clinical studies. The required subject number can be easily reached. Study design is easier. Agents whose efficacy or side effects are not clearly known can be administered on animals. There are fewer ethical restrictions as compared to human studies. Animal studies allow room for experiments which cannot be practiced on humans such as genetic and morphological analyses, and facilitate the analysis of the natural history of diseases such as cancer (8).

As animal studies may be conducted on living creatures and cost significant amounts of money, there is an ethical concern regarding their necessity. Animal studies should be applied primarily for scientific purposes and in cases where it is not possible to conduct the required experimental study on human beings (9). Furthermore, such studies should be planned in line with relevant clinical studies (8).

In Turkey, it is obligatory to prepare a dissertation at the end of residency programs in medicine. Because of a lack of time for clinical studies due to the heavy work-load of specialization training, and the desire to do a unique or uncomplicated study, researchers prefer animal studies for their dissertations.

It is also shown in this study that another significant reason for animal studies is to achieve the number of published dissertations required for academic promotion. In Turkey, specialized physicians must have specific number of papers published in SCIE journals to be promoted to associate professorship. Animal studies are likely to be published because carrying out new and unique studies in this field is not so difficult. Animal studies may be completed and submitted for publication within a shorter period as compared to clinical studies. As a result of those advantages, researchers aiming to increase their number of publications prefer animal studies over clinical studies.

As shown in this study, the main objective of carrying out animal studies in Turkey is usually to prepare a dissertation or to be entitled to academic promotion. In other words, there is a malpractice of animal testing in Turkey. Using large budgets and numerous experimental animals for personal goals is unethical. It has also been indicated in our former study that only 23% of animal experiments conducted for dissertation studies had been published. Additionally, Riet has reported that only 50% of animal studies may be published (10). It is understood from the low publication rate that a significant portion of animal studies fail to reach the scientific community. Furthermore, the fact that merely 58% of thesis-oriented animal studies were submitted for publication by the real owner indicates that the study did not have any scientific goal. It can be inferred from all those findings that even if conducting experimental tests on animals just for completing a dissertation is unethical, many researchers do so.

Questionnaires have indicated that the cost of 41% of animal studies was higher than 2500 $. Considering that more than 1000 animal studies are performed in Turkey per year, a large amount of money is spent not for scientific purposes but only for personal interests, such as promotion and dissertation.

In our study, it was determined that animal experiments have been performed for personal aims. This does not mean that animal experiments do not contribute to science, but we believe that the aim of performing these studies were not appropriate. Clinical studies should also be undertaken to make a contribution to science. There is no such information about the purpose of the clinical trials carried out. This can be demonstrated by further new studies.

There are some limitations of this study: Firstly, the study was designed as a questionnaire study, so the analyses performed within the scope of the study were based on participants' answers. However, participants may have given wrong or biased answers to the questions; therefore, the results obtained from the analyses may be incompetent or inaccurate. Secondly, rats and mice are the most commonly used animals in animal experiments (8). However, when we used only the keyword "rat" while searching the studies in PubMed, the results included merely the studies depending on rat experiments. As studies performed using other animals were left out of the scope of the study, the results may have been affected. Thirdly, the study analyzed only the animal studies conducted in Turkey, thus it may be incorrect to adapt these results for all animal studies world-wide. Because there may be differences between countries which have advanced research laboratories and those which do not. Nevertheless, it may be anticipated that the study results may be similar in countries whose development level is similar to that of Turkey.

CONCLUSION

This is the first study reporting the objectives of researchers who conduct animal studies. The present study has indicated that, in Turkey, animal studies are often performed to prepare a dissertation or get promotion as part of an academic career. Animal studies performed for personal requirements must be terminated. Furthermore, ethics committees approving animal researches should thoroughly analyze the authors' objectives prior to their approval.

Ethics Committee Approval: Ethics committee approval was not required because our study is a questionnaire study.

Informed Consent: Patient approval was not required because the study did not include patients.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - B.M.; Design - B.M.; Supervision - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.; Resources - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.; Materials - B.M.; Data Collection and/or Processing - B.M., E.C.Y.; Analysis and/or Interpretation - B.M.; Literature Search - B.M.; Writing Manuscript - B.M.; Critical Review - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Çalışma anket çalışması olduğu için etik kurul onayı alınmamıştır.

Hasta Onamı: Çalışma hastalarla ilgili bir çalışma olmadığı için hasta onayı alınmam**ıştır**.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - B.M.; Tasarım - B.M.; Denetleme - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.; Kaynaklar - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.; Malzemeler - B.M.; Veri Toplanması ve/veya İşlemesi - B.M., E.C.Y.; Analiz ve/veya Yorum - B.M.; Literatür Taraması - B.M.; Yazıyı Yazan - B.M.; Eleştirel İnceleme - B.M., U.D., T.B., E.C.Y., T.Ç., A.A., Y.A.M., M.T.O.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Appendix-1

1. What was the academic title of the researcher when she/he conducted the study?
a) Resident
b) Specialist
c) Associate Professor
d) Professor

2. Where was the study conducted?
a) University Hospital
b) Training and Research Hospital
c) State Hospital

3. Was the study planned as a dissertation study?
a) Yes
b) No

4. What was the budget of the study (approximately)?
a) <500 $
b) 500-1000 $
c) 1000-2500 $
d) 2500-5000 $
e) >5000 $

5. What was the aim of the study?
a) To write a dissertation
b) To provide a sufficient number of publications required for promotion to associate professorship/ professorship
c) To carry out further experiments related to my/our former studies
d) To carry out new studies in my field of interest
e) To have information on a field that I have not researched before

6. Which factors were taken into consideration in the planning phase?
a) Ease of conducting
b) Whether it would be the first study or not
c) Whether it could yield significant results or not
d) Presence of several similar studies
e) Publication potential
f) Whether it could contribute to former relevant international studies
g) Whether it could contribute to author's further studies on her/his field of interest or to her/his earlier studies

7. Who did submit the study for publication?
a) The owner/author of the study
b) Second parties contributing to the study
c) Thesis advisor (if it is a dissertation)
d) Unrelated parties who were present in the same working environment

Ulus Cerrahi Derg 2016; 32: 261-266
DOI: 10.5152/UCD.2015.3006

Experience and knowledge level of female health care professionals in Samsun province regarding puerperal mastitis

Samsun ilinde kadın sağlık profesyonellerinin puerperal mastit hakkındaki deneyim ve güncel bilgi düzeyleri

Recep Aktimur[1], Dilek Kıymaz[1], Kübra Gümüş[2], Kadir Yıldırım[1], Süleyman Çetinkünar[3], Nuraydın Özlem[1]

ABSTRACT

Objective: Inappropriate or insufficient knowledge of health care professionals about puerperal mastitis can lead mothers to premature weaning, as well as the lack of education on proper breastfeeding. However, the importance of education regarding puerperal mastitis seems to be underestimated.

Material and Methods: From July to August 2014, 317 female health care professionals were surveyed in Samsun, Turkey. Participants were classified into three groups; nurses, maternity care nurses (obstetrics and gynecology nurses and pediatrics clinic nurses), and midwives. A specifically prepared questionnaire was used to collect data.

Results: 69.1% (n=219) of female health care professionals had one or more child/ren. The median length of breastfeeding duration was 11 months (0-36) while the overall puerperal mastitis rate was 13.3% (n=29). Puerperal mastitis related cessation of breastfeeding was similar between the groups, with an overall rate of 3.1%. 61.1% of the participants stated that they had one or more hours of education regarding puerperal mastitis while 5.4% indicated that they learned about the pathology from their experiences. Midwives and maternity care nurses were found to be more knowledgeable than nurses regarding the reasons, risk factors, prevention, symptoms, and treatment of puerperal mastitis.

Conclusion: As a result, the current level of education regarding breastfeeding and puerperal mastitis and daily practice in female health care professionals in Turkey is far from desired levels. The breastfeeding education of health care professionals must be adapted to an effective program, such as UNICEF/WHO 20-hour breastfeeding training course, and puerperal mastitis should be accepted as a public health care issue.

Keywords: Breastfeeding health, education, health care professional, knowledge, puerperal mastitis

ÖZ

Amaç: Sağlık profesyonellerinin puerperal mastit hakkında yanlış ve yetersiz bilgiye sahip olması, uygunsuz emzirme eğitimine benzer şekilde annelerin emzirmeyi erken kesmesine sebep olabilir. Buna rağmen, puerperal mastit hakkındaki bilgi düzeyi ve eğitime gerekli önem verilmemektedir.

Gereç ve Yöntemler: Temmuz-Ağustos 2014 arasında Samsun ilinde yaşayan 317 bayan sağlık çalışanına anket uygulandı. Katılımcılar üç grupta sınıflandırıldı; hemşireler, anne bakım hemşireleri (obstetrik ve jinekoloji hemşireleri ve pediatri klinik hemşireleri) ve ebeler. Özel olarak hazırlanmış anket sorularına verilen cevaplar değerlendirildi.

Bulgular: Katılımcıların %69,1'i (n=219) bir ya da daha fazla çocuk sahibiydi. Ortanca emzirme süresi 11 ay (0-36), puerperal mastit oranı %13,3 (n=29) idi. Puerperal mastit ile ilişkili emzirmeyi kesme oranı %3,1 bulunur iken gruplar arasında oranlar benzerdi. Bayan sağlık profesyonellerinden %61,1'i puerperal mastit hakkında bir saat ya da daha uzun süre eğitim aldığını belirtirken, %5,4'ü kendi deneyimleriyle öğrendiğini belirtti. Ebeler ve anne bakım hemşireleri, puerperal mastit sebep, risk faktörleri, önleme yöntemleri, semptomları ve tedavisi hakkında hemşirelere göre daha bilgili idi.

Sonuç: Türkiye'deki bayan sağlık profesyonellerinin emzirme ve puerperal mastit hakkındaki eğitim seviyesi ve günlük uygulamaları istenilen seviyenin çok altındadır. Sağlık profesyonellerinin emzirme eğitimi, UNICEF/WHO 20-saat emzirme eğitim kursu gibi efektif bir programa adapte edilmeli ve puerperal mastit bir sağlık sorunu olarak kabul edilmelidir.

Anahtar Kelimeler: Emzirme sağlığı, eğitim, sağlık profesyoneli, bilgi, puerperal mastit

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Received / *Geliş Tarihi*: 23.11.2014
Accepted / *Kabul Tarihi*: 18.01.2015
Available Online Date / *Çevrimiçi Yayın Tarihi*: 06.04.2016

INTRODUCTION

Mastitis is an inflammatory condition of the breast, which may or may not be accompanied by infection and is usually associated with lactation (1). As it commonly occurs in lactating women, it is called lactational or puerperal mastitis, with a reported incidence varying from 2.9% to 33% of lactating women, mainly because of the absence of a reliable diagnostic test (2-5). It has been shown that only acute cases with local and systemic symptoms are being reported while subacute cases are systematically underreported (6).

Mainly, two conditions cause mastitis, milk stasis and infection (7). Stagnation of milk is caused by inappropriate breastfeeding attitudes including mother-infant positioning and attachment problems by the infants (8-10). With early recognition of the condition, the overall success rate of treatment can be as high as 96% in puerperal mastitis (11). After the initiation of antibiotic therapy and proper breast emptying, inflammatory symptoms of the affected breast are improved within two weeks (12). Delayed diagnosis or treatment may result in recurrent mastitis, breast abscess, and even mortality, in some circumstances (13).

Table 1. The descriptive questionnaire on puerperal mastitis and interpretation of the answers

1) What is the definition of mastitis? a) The inflammation of breast tissue b) The inflammation or infection of breast tissue c) I don't know	a or c; lack of knowledge about the definition of mastitis b; sufficient knowledge about the definition of mastitis
2) What is the reason/s of puerperal mastitis? a) There are no well-known reasons b) Milk stasis in the breast c) Cracked nipple d) Poor breastfeeding behavior e) I don't know	a or e; lack of knowledge about the reason of puerperal mastitis b, c, d; 2 of the 3 were accepted as sufficient knowledge about the reasons of puerperal mastitis
3) Are there risk factors for the development of puerperal mastitis? a) No b) Mastitis in previous lactation/s c) Cracked nipple d) Cream on nipples e) Poor breastfeeding behavior f) Oral antibiotics during breastfeeding g) I don't know	a or g; lack of knowledge about the risk factors of puerperal mastitis b, c, d, e, f; 3 of the 5 were accepted as sufficient knowledge about the risk factors of puerperal mastitis
4) Is the development of puerperal mastitis preventable? a) No b) Yes, with good breastfeeding habits c) Yes, with avoiding cracked nipple d) I don't know	a or d; lack of knowledge about the prevention of puerperal mastitis b or c; was accepted as moderate knowledge about the prevention of puerperal mastitis b and c; were accepted as sufficient knowledge about the prevention of puerperal mastitis
5) What are the symptoms of puerperal mastitis? a) Tenderness of the breast b) Breast pain c) Redness of the breast d) Breast lump e) Fever f) Flu-like symptoms (hot sweats or aches) g) It has no specific symptom h) The diagnosis can be only made with sonography i) I don't know	g or h or i; lack of knowledge about the symptoms of puerperal mastitis a, b, c, d; (2 of 4) and e, f; (1 of 2) were accepted as sufficient knowledge about the symptoms of puerperal mastitis
6) Is there any treatment for puerperal mastitis? a) No b) Removal of milk with pump c) Antibiotics d) Removal of milk with pump and antibiotics e) Probiotics f) I don't know	a or f; lack of knowledge about the treatment of puerperal mastitis b, c, d, e; 2 of the 4 were accepted as sufficient knowledge about the treatment of puerperal mastitis
7) Did you ever get an education on puerperal mastitis? a) Received, while I was studying b) Received, while I was working c) I did not d) I have informal knowledge e) I have learned from my own mastitis experience during previous lactation/s	a or b; were accepted as educated about puerperal mastitis c or d; lack of education about puerperal mastitis e; education from personal experiences

In addition to the positive correlation between proper breastfeeding attitudes and prevention of mastitis, it has been shown that puerperal mastitis is the third most common reason for premature weaning (14). Nearly one in four breastfeeding women indicated mastitis as the reason for premature weaning due to pain and discomfort (15). In addition, it was shown that a mother's education about proper breastfeeding attitudes during the first days of delivery and practices in the hospital could significantly influence future breastfeeding success and decrease postpartum problems (16, 17). So far, researchers have mostly focused on breastfeeding education (18-23). However, the importance of knowledge regarding puerperal mastitis is underestimated.

The present status of the knowledge level on puerperal mastitis in Turkey is unknown. In this descriptive survey, we aimed to evaluate the current experience and knowledge level of a group of female health care professionals in Samsun regarding puerperal mastitis.

MATERIAL AND METHODS

Participants

The study was approved by Ondokuz Mayıs University Ethics Committee and informed consents were obtained from all participants. Over a 4-week period from July to August 2014, female health care professionals were surveyed at one university hospital, one education and research hospital, and five local state hospitals (100 or more bed capacity) in Samsun, Turkey. Following a short overview, 317 of the 550 female health care professionals accepted to participate in the survey (response rate was 57.6%).

Participants were classified into three groups; nurses, maternity care nurses (obstetrics and gynecology nurses and pediatrics clinic nurses), and midwives. A specifically prepared questionnaire was used to collect data.

Survey Item

The survey consisted of questions related to the demographic characteristics of the participants, history of previous birth/s, previous breastfeeding attitudes, mastitis or breast abscess experience, and the reason for cessation of breastfeeding. In addition, education on breastfeeding during previous birth/s, training on mastitis during their training or employment, and their knowledge regarding the definition, reasons, risk factors, symptoms, prevention methods and treatment of puerperal mastitis were addressed.

As there is no standard definition, the presence of at least two symptoms including pain, hyperemia and lump along with at least one symptom including fever or flu-like symptoms was accepted as puerperal mastitis (23). When a participant answered "yes" to the experience of self-puerperal mastitis, she was questioned about her symptoms and the final answer was revised (if required) according to the aforementioned definition criteria of puerperal mastitis.

A participant who has taken one hour or more education about puerperal mastitis during their training or employment period was accepted as educated.

Statistical Analysis

Continuous data were presented as mean±standard deviation (SD) or median and range. Dichotomous and categorical data were presented as numbers with percentages. Normally dis-

Table 2. Experience about breastfeeding and mastitis in the participants with children

	Nurses (n=158)	Maternity care nurses (n=31)	Midwives (n=30)	Total (n=219)	p
Number of children (median and range)	1 (1-4)	2 (1-4)	2 (1-3)	2 (1-4)	0.915
The length of breastfeeding education (min) (median and range)	12.5 (0-180)	30 (0-60)	60 (60-120)	15 (0-180)	0.001
Maximum breastfeeding period (month) (median and range)	11 (0-36)	6 (2-36)	11.5 (2-24)	11 (0-36)	0.732
Mastitis, n (%)	22 (14)	2 (6.5)	5 (16.7)	29 (13.3)	0.207
Breast abscess, n (%)	9 (5.7)	1 (3.2)	1 (3.3)	11 (5)	0.999
Mastitis treatment, n (%)					
Removal of milk	10 (45.6)	-	2 (40)	12 (41.6)	0.002
Antibiotics	5 (22.7)	-	-	5 (17.2)	
Removal of milk and antibiotics	5 (22.7)	2 (100)	3 (60)	10 (34.4)	
Probiotics and others	2 (9)	-	-	2 (6.8)	
Post-mastitis breastfeeding period (month) (median and range)	1 (0-10)	-	2 (0-8)	1 (0-10)	0.203
The reason for cessation of breastfeeding, n (%)					
No breastfeeding	6 (4)	-	-	6 (2.9)	0.214
Voluntarily or beginning to work	101 (63.9)	23 (74.2)	21 (70)	145 (66.2)	
Insufficient milk or nipple problems	48 (30.3)	6 (19.3)	7 (23.3)	61 (27.8)	
Mastitis related	3 (1.8)	2 (6.5)	2 (6.7)	7 (3.1)	

tributed continuous data were assessed with one-way ANOVA test. If the data were not normally distributed, continuous data were evaluated with Kruskal-Wallis test. The Chi-square test and Fisher's exact tests were used to compare categorical variables. A two-tailed p-value <0.05 was considered to be statistically significant. Statistical analyses were performed with the Statistical Package for the Social Sciences, version 16.00 (SPSS Inc.; Chicago, IL, USA).

RESULTS

The mean age of the study group was 32.7±6.8 (18-51). Of the participants; 241 (%76) were nurses, 38 (12%) maternity care nurses, and 38 (12%) were midwives. The descriptive questionnaire about puerperal mastitis and interpretation of the answers are presented in Table 1.

69.1% (219) of female health care professionals had one or more child/ren. The median length of breastfeeding duration was 11 months (0-36) while the overall puerperal mastitis rate was 13.3% (n=29). In the presence of puerperal mastitis, milk emptying and antibiotics treatments were used at a higher proportion of maternity care nurses and midwives as compared to nurses (p=0.002). Puerperal mastitis related cessation of breastfeeding was similar between the groups, with an overall rate of 3.1%. Experience with breastfeeding and mastitis in the participants with child/ren are presented in Table 2.

143 (59.6%) of nurses, 27 (73%) of maternity care nurses, and 24 (64.9%) of midwives stated that they have taken one hour or more education regarding puerperal mastitis (p=0.426), with an overall rate of 61.1% (n=194). Only 5.4% (n=17) of the participants stated that they obtained knowledge regarding puerperal mastitis from their experiences.

Midwives and maternity care nurses were found to be more knowledgeable than nurses regarding the reasons, risk factors, prevention methods, symptoms, and treatment of puerperal mastitis. Having a child increased the knowledge level on the cause of puerperal mastitis in nurses and midwives (p<0.001, p=0.024), and increased the knowledge level in the treatment of puerperal mastitis in nurses (p<0.001). Knowledge levels regarding puerperal mastitis according to groups are presented in Table 3.

DISCUSSION

The consequences of avoiding breastfeeding for mothers and babies have led many governments to develop supportive health care policies (24, 25). In addition to these efforts, increasing awareness on the importance of proper breastfeeding education in the early post-delivery period as well as continued communication with a health care professional is essential to prevent breastfeeding-related problems (26). However, inappropriate or insufficient knowledge of health care professionals about the definition, prevention methods, and treatment of puerperal mastitis can lead mothers to premature weaning, as well as the lack of education on proper breastfeeding (27). Education regarding puerperal mastitis seems to be underestimated. In this descriptive survey, we aimed to uncover the knowledge level regarding puerperal mastitis among a group of female health care professionals.

Table 3. Knowledge levels regarding puerperal mastitis according to groups

	Nurses (n=241)			Maternity care nurses (n=38)			Midwives (n=38)			Total (n=317)
Knowledge about, n (%)	With child/ren (n=158)	Without child/ren (n=83)	p	With child/ren (n=31)	Without child/ren (n=7)	p	With child/ren (n=30)	Without child/ren (n=8)	p	Overall p
Definition of mastitis										
Sufficient	136 (86.1)	73 (88)	0.683	26 (83.9)	4 (57.2)	0.117	26 (86.6)	6 (75)	0.587	0.437
Insufficient	22 (13.9)	10 (12)		5 (16.1)	3 (42.8)		4 (13.4)	2 (25)		
Reason of mastitis										
Sufficient	74 (46.8)	19 (22.9)	<0.001	24 (77.5)	3 (42.8)	0.161	26 (86.6)	4 (50)	0.024	<0.001
Insufficient	84 (53.2)	64 (77.1)		7 (22.5)	4 (57.2)		4 (13.4)	4 (50)		
Mastitis risk factors										
Sufficient	56 (35.4)	22 (26.5)	0.159	16 (51.6)	3 (42.8)	0.999	24 (80)	4 (50)	0.087	<0.001
Insufficient	102 (64.6)	61 (73.5)		15 (48.4)	4 (57.2)		6 (20)	4 (50)		
Prevention of mastitis										
Sufficient or moderate	134 (84.9)	71 (85.5)	0.124	30 (96.8)	7 (100)	0.712	28 (93.3)	7 (87.5)	0.196	0.001
Insufficient	24 (15.1)	12 (14.5)		1 (3.2)	-		2 (6.7)	1 (12.5)		
Symptoms of mastitis										
Sufficient	129 (81.6)	60 (72.3)	0.093	31 (100)	7 (100)	0.999	30 (100)	7 (87.5)	0.211	<0.001
Insufficient	29 (18.4)	23 (27.7)		-	-		-	1 (12.5)		
Treatment of mastitis										
Sufficient	87 (55.1)	26 (31.3)	<0.001	20 (64.5)	4 (57.2)	0.999	27 (90)	6 (75)	0.363	<0.001
Insufficient	71 (44.9)	57 (68.7)		11 (35.5)	3 (42.8)		3 (30)	2 (25)		

It was stated that education on proper breastfeeding decreases the rate of puerperal mastitis (16, 17). The UNICEF/WHO 20-hour breastfeeding training course was reported to significantly improve management of mastitis among health care professionals (18). In our study, the length of post-delivery breastfeeding education time in the participants was found to be far below the desired levels with just about 15 minutes. de Oliveira et al. (19) have shown that a 30-minute counseling session on breastfeeding techniques in the maternity ward was not sufficient to reduce the incidence of mastitis during the first month.

The incidence of puerperal mastitis was reported as 2.9-33% in the literature (2-5). However, the actual incidence of puerperal mastitis in Turkey is unknown. A recent study (28) reported the puerperal mastitis rate as 9.2% while another study (29) with a broad definition of breast problems stated that 71.4% of the study group had postpartum breast problems (breast engorgement, tenderness, and pain). In the present study, we found the puerperal mastitis rate in 219 female health care professionals as 13.3%, with a 5% rate of breast abscess. Although there is no data on the frequency of breast abscess in Turkey, the rates detected in our study was similar to the previously reported rates of 3-11% (30).

Habibe Şahin et al. (28) demonstrated that the mean of maximum breastfeeding duration was 17.7±8.0 months in mothers who presented to public health care centers in Kayseri, Turkey. In the present study, the median of maximum breastfeeding period was found to be 11 months (0-36) among female health care professionals. It seems that health care professionals are breastfeeding for shorter periods and they experience puerperal mastitis more frequently. This difference may be associated with the socio-cultural environment of study groups as well as insufficient education of health care professionals in our study. In addition, the requirements for and the need to early return to work may have affected proper breastfeeding attitudes in health care professionals. In our study, the main reasons for cessation of breastfeeding were voluntary discontinuance and beginning to work (68.1%), which were similar between the groups. The overall puerperal mastitis related cessation rate was determined as 3.1% that is consistent with previously published series (23).

As we have no data on the sufficient time for puerperal mastitis-specific education, we have accepted one-hour as a cut-off. 194 (61.1%) of the female health care professionals stated that they had approximately one hour or more education on puerperal mastitis. Although, the education time was similar between the groups, recommended treatment of breast emptying and antibiotics usage was significantly higher in maternity care nurses and midwives, thus it may reflect the importance of experience rather than education.

In all knowledge level measurement questions, except the definition of puerperal mastitis, midwives, and maternity care nurses were more knowledgeable than the nurses. However, the recommended treatment was significantly different only in participants with an experience of puerperal mastitis.

Study Limitations

This study has some limitations. Although the total number of participants seems to be adequate, the distribution was not homogeneous. Additionally, some features of study participants may affect the results; 1) the relatively small sample size of maternity care nurses and midwives, 2) the differences in college training and current working status among participants. Most of our participants have one or more child/ren. Although only a small percentage of female health care professionals reported obtaining knowledge on puerperal mastitis from their experiences, we must note that the discrimination between education and experience related knowledge is difficult. To assess this issue independently, choosing the study population from recently graduated female health care professionals without children may be beneficial.

CONCLUSION

The results of our study imply that the current level of education regarding breastfeeding and puerperal mastitis, and the daily practice among female health care professionals in Turkey are far from the desired levels. In addition, the similarity in mastitis rates among housewives and health care professionals is noteworthy. It seems that socio-cultural environment may be an important factor. The breastfeeding education of health care professionals must be adapted to an effective program, such as the UNICEF/WHO 20-hour breastfeeding training course, and puerperal mastitis should be accepted as a public health care issue.

Ethics Committee Approval: Ethics committee approval was obtained for this study from the ethics committee of Ondokuz Mayıs University.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - R.A.; Design - R.A., D.K., K.G.; Supervision - R.A., N.Ö.; Resources - R.A., D.K., K.G.; Materials - K.Y.; Data Collection and/or Processing - R.A., D.K., K.G.; Analysis and/or Interpretation - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.; Literature Search - R.A.; Writing Manuscript - R.A.; Critical Review - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.; Other - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı Ondokuz Mayıs Üniversitesi Etik Kurulu'ndan alınmıştır.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - R.A.; Tasarım - R.A., D.K., K.G.; Denetleme - R.A., N.Ö.; Kaynaklar - R.A., D.K., K.G.; Malzemeler - K.Y.; Veri Toplanması ve/veya İşlemesi - R.A., D.K., K.G.; Analiz ve/veya Yorum - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.; Literatür Taraması - R.A.; Yazıyı Yazan - R.A.; Eleştirel İnceleme - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.; Diğer - R.A., D.K., K.G., K.Y., S.Ç., N.Ö.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 267-274
DOI: 10.5152/UCD.2016.3195

Özgün Araştırma / *Original Investigation*

19. Ulusal Cerrahi Kongresi gözlemsel çalışma sözel bildiri raporlama kalitesinin analizi: Türkçe temelli bir ulusal değerlendirme sistemi önerisi

Analysis of reporting quality for oral presentations of observational studies at 19th National Surgical Congress: Proposal for a national evaluation system

Mustafa Hasbahçeci[1], Fatih Başak[2], Aylin Acar[2], Abdullah Şişik[2]

ÖZ

Amaç: 19. Ulusal Cerrahi Kongresi sözel bildiri özetlerinin mevcut uluslararası değerlendirme sistemleri yanında Türkçe olarak geliştirilen ulusal bir değerlendirme sistemi ile karşılaştırmalı analizi, sistemlerin hakemler tarafından uygulanabilme kolaylığı, hakemler ve sistemler arası uyum özelliklerinin belirlenmesi amaçlanmıştır.

Gereç ve Yöntemler: Kongre bildiri özetleri kitapçığındaki sözel bildirilerden rastgele seçilen 50 gözlemsel çalışma STROBE (Strengthening the Reporting of Observational Studies) değerlendirme sistemi, Timmer aracı ve Ulusal Değerlendirme Sistemi kullanılarak iki farklı hakem tarafından, çalışmayı gerçekleştiren yazar ve kurum bilgileri kör olacak şekilde değerlendirildi. Bildiri skorları ve değerlendirme süreleri hesaplandı. Üç farklı değerlendirme sistemi ile elde edilen bildiri skoru esas değişken olarak kabul edildi. Her bir değerlendirme sistemi için hakemlerin verdiği skorlar, değerlendirme süreleri ve kendi aralarındaki uyum karşılaştırıldı. Hakemler arası bildiri skoru ve süre karşılaştırması için Wilcoxon eşleştirilmiş çiftler işaret sıralama ve Friedman testleri, hakemler arası uyum için kappa uyum analizi, hakemlerin ikişerli sistem değerlendirmesi korelasyonunda Spearman korelasyon analizi kullanıldı. %95'lik güven aralığında, 0,05'ten küçük p değeri anlamlı kabul edildi.

Bulgular: Her bir değerlendirme sistemi için hakemlerin verdiği skorlar arasında anlamlı bir fark yoktu ($p>0,05$). İki hakem arasında değerlendirme süresi açısından, her bir sistem için geçerli olmak üzere, anlamlı bir fark tespit edildi ($p<0,05$). Hakemler arası uyum en fazla Timmer aracında idi (orta, $\varkappa=0,523$). STROBE ve ulusal değerlendirme sistemi için uyum kabul edilebilir düzeyde (sırasıyla $\varkappa=0,394$ ve $\varkappa=0,354$) idi. Hakemlerin ikişerli sistem değerlendirmesinde, bildiri skorlarının birbirleri ile anlamlı bir şekilde aynı yönde artış gösterdiği görüldü ($p<0,05$).

Sonuç: Uluslararası kullanılan sistemlerle benzer şekilde hakemler arası uyumlu sonuçlar vermesi ve süre açısından uygulanabilirlik kolaylığına sahip olması açısından ulusal değerlendirme sistemi, kongre bildiri özetlerinin değerlendirilmesi için uygun bir yöntemdir.

Anahtar kelimeler: Bildiri özeti, kongre, raporlama kalitesi

ABSTRACT

Objective: To compare the quality of oral presentations presented at the 19th National Surgical Congress with a national evaluation system with respect to the applicability of systems, and consistency between systems and reviewers.

Material and Methods: Fifty randomly selected observational studies, which were blinded for author and institute information, were evaluated by using the Strengthening the Reporting of Observational Studies (STROBE), Timmer Score, and National Evaluation System by two reviewers. Abstract scores, evaluation periods, and compatibility between reviewers were compared for each evaluation system. Abstract scores by three different evaluation systems were regarded as the main outcome. Wilcoxon matched-pairs signed rank and Friedman tests for comparison of scores and times, kappa analysis for compatibility between reviewers, and Spearman correlation for analysis of reviewers based on pairs of evaluation systems were used.

Results: There was no significant difference between abstract scores for each system ($p>0.05$). A significant difference for evaluation period of reviewers was detected for each system ($p<0.05$). Compatibility between reviewers was the highest for the Timmer Score (medium, $\varkappa=0.523$), and the compatibility for STROBE and National Evaluation System was regarded as acceptable ($\varkappa=0.394$ and $\varkappa=0.354$, respectively). Assessment of reviewers for pairs of evaluation systems revealed that scores increased in the same direction with each other significantly ($p<0.05$).

Conclusion: The National Evaluation System is an appropriate method for evaluation of conference abstracts due to the consistent results between the referees similarly with the current international evaluation systems and ease of applicability with regard to evaluation period.

Keywords: Abstract, congress, reporting quality

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Geliş Tarihi / *Received*: 11.05.2015
Kabul Tarihi / *Accepted*: 19.08.2015

GİRİŞ

Bilimsel çalışmaların ve kongre bildiri özetlerinin kalite ve literatür değerlerinin artırılması için çeşitli raporlama kriterleri oluşturulmuştur (1-4). Bu kriterler kongre bildiri özetlerinin özellikle sunum standardizasyonunun sağlanması ve raporlama kalitesinin artırılması için kullanılmaktadır (5). Çalışmaların kongrelere bildiri olarak kabul edilme ve yayımlanma süreçlerindeki değerlendirmelerde, bahsedilen sistemlerin uygulanabilme kolaylığı ile ilgili karşılaştırmalı çalışmalar söz konusudur (5-8). Aynı şekilde, bu sistemlerin randomize kontrollü, gözlemsel ve deneysel her bir çalışma tipine uygulanma zorluğu, değerlendirme sürecinin zaman alıcı bir işlem olması ve sistemleri oluşturan parametrelerin subjektif özellikler içermesi herhangi bir değerlendirme sisteminin yaygınlık bulmasındaki engeller olarak ortaya çıkmaktadır (1, 8). Bu sebeplerden dolayı, "en iyi sistem" yerine "en uygun sistem" arayışı devam etmektedir (9).

Bu değerlendirme sistemlerinin orijinal dilinden farklı dillere çevirilerinde anlamsal ve kavramsal sorunlar yaşanabilmektedir. Bu durumun uygulama zorluğu nedeniyle yaygın kullanıma engel olduğu düşünülmüştür (3, 10). Sorunun giderilmesi amacıyla, Türkçe dili kullanılan ulusal temelli bir kongre bildiri özeti değerlendirme sistemi geliştirilmesi için yapılmış çalışmalar bulunmaktadır (11). Türkçe olarak geliştirilen yeni değerlendirme sisteminin, yaygın kullanım alanı bulunan uluslararası diğer sistemler ile uyumluluk açısından karşılaştırmalı çalışmalara ihtiyacı bulunmaktadır.

Bu çalışmada, 2014 yılında gerçekleştirilen 19. Ulusal Cerrahi Kongresi'nde (UCK-2014) kabul edilen sözel bildiri özetlerinin, Türkçe kongre bildiri özeti değerlendirme sistemi ve mevcut uluslararası değerlendirme sistemleri ile karşılaştırmalı olarak analizi, sistemlerin hakemler tarafından uygulanabilme kolaylığı, hakemler ve sistemler arası uyum özelliklerinin belirlenmesi amaçlanmıştır.

GEREÇ VE YÖNTEMLER

Ulusal Cerrahi Kongresi-2014 kapsamında kabul edilen ve dijital olarak basılı hale getirilen bildiri özetlerinden sözel bildiriler elektronik ortamda tarandı. Çalışma tipine göre bildiriler "randomize kontrollü", "gözlemsel" ve "deneysel" çalışmalar olarak gruplandı. Katılımcıların rastgele olarak tedavi ya da kontrol gruplarına dağıtıldığı belirtilen prospektif çalışmalar randomize kontrollü çalışma olarak tanımlandı. Prospektif tanımlayıcı (kohort), retrospektif vaka-kontrol ve kesitsel çalışmalarla, tanımlayıcı vaka serileri gözlemsel çalışma; laboratuvar ortamında herhangi bir hayvan üzerinde ya da insanlardan alınan doku ve hücreler üzerinde gerçekleştirilen bütün çalışmalar ise deneysel çalışma olarak değerlendirildi. Bu gruplara yerleştirilemeyen maliyet analizi, anket çalışması özelliğindeki bildiriler ile vaka sunumları "diğer" olarak sınıflandırıldı. UCK-2014'te kabul edilen sözel bildirilerin dağılımı Tablo 1'de verildi.

Randomize kontrollü çalışmalar, deneysel çalışmalar ve diğer kategorisindeki çalışmalar analiz dışı tutuldu. Gözlemsel çalışmalar için örneklem grubu UCK-2014'deki 404 gözlemsel çalışma arasından, %10-15 arası farklılığın tespit edilebilmesini %90 doğrulukta öngörmek üzere, bilgisayar yardımlı rastgele numaralar kullanılarak 50 bildiri olacak şekilde seçildi. Bildiri yazarlarına ve kliniklerine körlüğü oluşturmak için örneklem gruplarındaki bildirilerin ilgili kısımları dijital olarak görünmez hale getirilip resim dosyası olarak oluşturulan sisteme aktarıldı. Gözlemsel çalışma değerlendirmesi için STROBE (Strengthening the Reporting of Observational Studies) ve Timmer araçlarının Türkçe versiyonları ile birlikte daha önce önerilen ulusal değerlendirme sistemi (UDS) web ortamında oluşturulan bildiri değerlendirme sistemine yüklendi ve hakemlerin kullanımına sunuldu (http://ulusaldegerlendirmesistemi.blogspot.com.tr/). Sistem üzerinde kişisel değerlendirme yetkisi verildikten sonra, bir eğitim ve araştırma hastanesinde genel cerrahi uzmanı olarak görev yapan iki araştırmacı (AS, AA) birbirinden bağımsız şekilde değerlendirmelerini gerçekleştirdi. Sistem ayrıca her değerlendirme tipine göre ayrı olmak üzere değerlendiricinin harcadığı toplam süreyi kaydetti. Örneklem grubundaki bildiriler STROBE, Timmer ve UDS araçlarına göre sistem üzerinden kullanıcılar tarafından skorlandı.

Geliştirilen sistem üzerinde her bir parametre, bildirinin STROBE, Timmer ve UDS kriterlerindeki o özelliği içerip içermediğine göre "0" ya da "1" olarak değerlendirilip elde edilen toplam puan, bildirinin skoru olarak kaydedildi. Toplam 16 parametre bulunan UDS aracındaki üç parametre ve toplam 19 parametre bulunan Timmer aracındaki dört parametre, gözlemsel çalışmalar için uygulanamaz olduğundan değerlendirmede devre dışı bırakıldı. Dolayısıyla, değerlendirme araçlarının değer aralıkları STROBE için 0-11 (Ek dosya 1), Timmer (Ek dosya 2) için 0-15 ve UDS (Ek dosya 3) için 0-13 olarak belirlendi.

İstatistiksel Analiz

Çalışma verileri değerlendirilirken tanımlayıcı istatistiksel metodlar (Ortalama, standart sapma, oran, değer aralığı) kullanıldı. Her bir değerlendirme sistemine hakemlerin verdiği skorların ve değerlendirme sürelerinin karşılaştırması için Wilcoxon eşleştirilmiş çiftler işaret sıralama testi ve Friedman testi kullanıldı. Her bir hakemin ikişerli olarak değerlendirme sistemleri arasındaki korelasyon değerlendirmesinde Spearman korelasyon analizi kullanıldı. Her bir değerlendirme sistemi sonuçlarının hakemler arası olan uyumlarının belirlenmesi için kappa uyum analizi testi yapıldı. Uyum derecesinin belirlenmesinde kappa katsayısının (κ) <0,20 olması zayıf, 0,21-0,40 olması kabul edilebilir, 0,41-0,60 olması orta, 0,61-0,80 iyi ve >0,80 çok iyi olarak kabul edildi. Sonuçlar %95'lik güven aralığında, anlamlılık p<0,05 düzeyinde değerlendirildi.

BULGULAR

Ulusal Cerrahi Kongresi-2014 Kongre'si için her bir araştırıcının çalışma tipine göre verdiği puanların toplam skorları ve değerlendirme için harcanan süreler Tablo 2 ve Tablo 3'te verildi. Her

Tablo 1. 19. Ulusal Cerrahi Kongresi'nde kabul edilen sözel bildirilerin çalışma tipi açısından dağılımı

Çalışma tipi	n (%)
Randomize kontrollü	9 (1,9)
Gözlemsel	404 (85,4)
Deneysel	34 (7,2)
Diğer	26 (5,5)
Toplam	473

Tablo 2. 19. Ulusal Cerrahi Kongresi'nin değerlendirme sistemi ve hakemlere göre toplam skorları

Sistem	Maksimum skor	Hakem 1 skoru¶	Hakem 1 değer aralığı	Hakem 2 skoru¶	Hakem 2 değer aralığı	pμ
STROBE	11	5,5±1,4 (5)	2-8	5,4±1,9 (5)	1-9	0,708
Timmer	15	7,1±2,8 (7)	0-14	7,5±2,2 (7)	3-13	0,206
UDS	13	7,6±1,8 (8)	1-12	7,4±2,1 (8)	2-11	0,386

¶:ortalama±standart sapma (ortanca); μ: Wilcoxon eşleştirilmiş çiftler işaret sıralama testi; STROBE: Strengthening the Reporting of Observational Studies; UDS: Ulusal Değerlendirme Sistemi

Tablo 3. 19. Ulusal Cerrahi Kongresi'nin değerlendirme sistemi ve hakemlere göre toplam değerlendirme süreleri

Sistem	Maksimum skor	Hakem 1 toplam süre (sn)¶	Hakem 1 değer aralığı (sn)	Hakem 2 toplam süre (sn)¶	Hakem 2 değer aralığı (sn)	pμ
STROBE	11	54,5±17,6	31-107	111,3±48,2	28-272	0,001
Timmer	15	75,8±20,7	44-133	123,0±44,2	39-257	0,001
UDS	13	82,8±33,8	40-225	103,2±38,4	38-201	0,009
pβ		0,001		0,019		

¶:ortalama±standart sapma; μ:Wilcoxon eşleştirilmiş çiftler işaret sıralama testi; β: Friedman testi; STROBE: Strengthening the Reporting of Observational Studies; UDS: Ulusal Değerlendirme Sistemi

Tablo 4. Hakemler arasında her bir değerlendirme sistemine göre uyum analizi

	Kappa değeri	p
STROBE	0,393	0,001
Timmer	0,523	0,001
UDS	0,354	0,001

STROBE: Strengthening the Reporting of Observational Studies; UDS: Ulusal Değerlendirme Sistemi

Tablo 5. Hakemlerin sistemler arası korelasyon analizi

	STROBE x Timmer p (korelasyon katsayısı)μ	STROBE x UDS p (korelasyon katsayısı)μ	Timmer x UDS p (korelasyon katsayısı)μ
Hakem 1	0,003 (0,408)	0,001 (0,503)	0,001 (0,599)
Hakem 2	0,014 (0,346)	0,001 (0,501)	0,001 (0,444)

μ:Spearman korelasyon; STROBE: Strengthening the Reporting of Observational Studies; UDS: Ulusal Değerlendirme Sistemi

iki hakem n-beraber değerlendirildiğinde, elde edilen en yüksek skor STROBE aracı ile 9 (maksimum skor 11), Timmer aracı ile 14 (maksimum skor 15) ve UDS ile 12 (maksimum skor 13) oldu.

Her bir değerlendirme sistemi için hakemlerin verdiği skorlar karşılaştırıldığında, anlamlı fark tespit edilmedi (Tablo 2).

Hakemlerin değerlendirme için sistemde kalma süreleri karşılaştırıldığında, iki hakem arasında her bir sistem için anlamlı bir fark tespit edildi (Tablo 3). Hakem 1'in değerlendirme süresi hakem 2'den anlamlı bir şekilde daha kısa idi. Değerlendirme sistemlerinin hakemlere göre karşılaştırmasında, STROBE sisteminin hakem 1 (p=0,001) ve UDS sisteminin hakem 2 (p=0,019) tarafından, diğer iki sisteme göre anlamlı bir şekilde daha kısa sürede değerlendirildiği saptandı (Tablo 3).

Kappa uyum analizi, hakemler arasında uyumun her bir değerlendirme sisteminde olduğunu gösterdi. Ancak uyumun en fazla Timmer değerlendirme sisteminde (orta, κ=0,523) olduğu tespit edildi (Tablo 4). Kappa değeri STROBE ve UDS için sırasıyla κ=0,394 (kabul edilebilir) ve κ=0,354 (kabul edilebilir) olarak bulundu. Her bir hakemin sistemler arası (Strobe-Timmer, Strobe-UDS, Timmer-UDS) korelasyon analizinde tüm değerlendirmeler, skorların birlikte arttığı yönünde olmak üzere anlamlı sonuçlandı (Hakem 1 için sırasıyla p=0,003, 0,001, 0,001, Hakem 2 için sırasıyla p=0,014, 0,001, 0,001) (Tablo 5).

TARTIŞMA

Kongre bildiri özetlerinin herhangi bir değerlendirme sistemi ile incelenmesi ve skorlanmasının yazım kalitesine ve standardizasyona olan katkısı bilinen bir husustur. Bu amaç için dünyada genel kabul görmüş değerlendirme sistemleri kullanılabileceği gibi, ulusal bazlı bir sistemin geliştirilmesi ve yaygınlaştırılmasının da faydalı olacağı düşünülmektedir. Ayrıca raporlama kalitesi yanında, araştırma metod kalitesine yönelik parametrelerin eklenmesi de mümkündür (8). Fakat hakemlik değerlendirme sürecinde altın standartların olmadığı da akılda tutulmalıdır (9).

Bilimsel kongreler kapsamında sunumu yapılan sözlü ve poster bildiriler çalışma tipleri açısından incelendiğinde, büyük bir çoğunluğunun gözlemsel çalışma olduğu ve randomize kontrollü çalışmalar ile deneysel çalışmaların çok daha az oranda yer aldığı görülmektedir (1, 5, 6). Bu veri ile uyumlu bir şekilde, UCK-2014 Kongresi'nde sunumu yapılan sözlü bildirilerin %85,4'ü gözlemsel çalışmalardan oluşmakta idi. Buna ek olarak, kongrelere gönderilen poster bildirilerin büyük bir kısmının kabul edilme eğilimi de söz konusudur (12). Bu yüzden, çalışma kapsamında sadece sözel bildirilerin olduğu gözlemsel çalışmalar analiz edildi.

Bilimsel alanda yaygın kullanım alanı bulunan CONSORT (Consolidated Standards of Reporting Trials) ve STROBE değerlendirme sistemlerinin sırasıyla, randomize kontrollü ve gözlemsel çalışmalar için ayrı ayrı kullanılması gibi, her bir çalışma tipi için ayrı kriterlerin belirlenmesi daha uygun bir yaklaşım olarak gözükmektedir (3, 4, 10, 13). Buna karşın, Timmer ve arkadaşlarının geliştirdiği değerlendirme aracı ise, deneysel çalışmaların da yer aldığı daha fazla çeşitlilikteki çalışmalar için uygulanabilir özelliktedir (8). Fakat çalışma tipine göre bazı değişiklikler yapılmasına sıklıkla rastlanılmaktadır (5, 8, 11). Her ne kadar UDS, gözlemsel ve randomize kontrollü çalışmalara ait bildiri özetlerinin değerlendirilmesi amacıyla geliştirilmeye çalışılmakla birlikte, bazı parametrelerin çalışma tipine göre ayrıştırılması gerekmiştir (11). Bu yüzden, randomize kontrollü ve gözlemsel çalışmalar için iki farklı değerlendirme sistemi uygulamasının daha uygun bir yöntem olacağı düşünülmektedir.

Timmer'in geliştirdiği değerlendirme aracında her bir bildiri özeti için ortalama 225 saniye süre harcandığı ve hakemlere parametreler ile ilgili hazırlanan bir el kitapçığının önceden verildiği bildirilmiştir (8). Sadece kendi çalışmaları için geliştirilen beş parametrelik bir değerlendirme sisteminin kullanıldığı Bydder'in çalışmasında, 63 özet için ortalama 3 saatin harcandığı dikkate alındığında, her bir bildiri için yaklaşık 180 saniye gerekli olduğu sonucuna ulaşılmıştır (7). Bu çalışmada ise, Timmer değerlendirme aracı için hakemlerin değerlendirme

süresi ortalama 75,8-123,0 saniye olarak daha kısa sürede gerçekleşmiştir. STROBE ve UDS için değerlendirme süresi aralığı 54,5-111,3 ve 82,8-103,2 saniye olarak farklılık göstermiştir. Hakemlerin daha fazla süre harcamasının değerlendirmeye olan etkisinin belirlenmesi zor bir konudur. Dolayısıyla, bu ilişkinin etkisi hakkında herhangi bir değerlendirme yapılmamıştır. Ancak yeni geliştirilen UDS'nin diğer sistemlerle kabul edilebilir sürelerde değerlendirildiği sonucuna ulaşılabilir.

Kongre bildirilerinin değerlendirilmesi ile ilişkili bir diğer önemli sorun, hakemler arası uyumdur (7). Değerlendirme sisteminde yer alan konunun önemi, orijinallik, akademik katkı ve bilimsel bir tartışmayı tetikleme gibi subjektif parametrelerin daha fazla olması halinde, uyumsuzluk daha da belirginleşmektedir (9, 14). Hakemlerin farklı merkezden olmasının da buna etki ettiği düşünülmektedir (14). Ayrıca bilimsel bir yayının ya da kongre bildiri özetinin kabul ya da reddedilme sürecinde, birden fazla hakemin yaptığı değerlendirmelerin kendi aralarındaki uyumunun kappa analizi ile değerlendirmelerinde, katsayısı ile şans faktörünün birbirine yakın olduğunu gösteren çalışmalar da vardır (12). Değerlendirmelerde hakemler arası uyum incelemesi ile ilişkili olarak kappa katsayısı 0,11 ile 0,60 arası değişen değerler bildirilmekte, 0,40'tan daha yüksek değerlere çoğunlukla rastlanmamaktadır (9, 12). Bunlar göz önüne alındığında, hakemler arası en fazla orta derecede bir uyumdan bahsetmek mümkün olmaktadır. Bu çalışmada hakemler arası uyumu gösteren kappa değerleri STROBE, Timmer ve UDS için sırası ile 0,393, 0,523 ve 0,354 olarak tespit edilmiştir. Bu değerler, literatürdeki benzer çalışmalar ile kıyaslandığında kabul edilebilir olarak yorumlanmıştır. Hakemler arası uyumun yüksek olması her ne kadar güvenilir bir sisteme işaret etse de, bir gruptaki özetlerin tamamının sistematik bir şekilde pozitif ya da negatif olarak etkilendiği bir yanlılık durumunu da gösterebilir (9). Bu faktörler göz önüne alındığında orta derecede bir uyumun en geçerli seviye olduğu sonucuna varılabilir.

İyi bir bilimsel hakemlik için 40 yaşından daha genç ve epidemiyoloji ya da istatistik eğitimi almış olmanın önemli olduğu vurgulanmaktadır (14). Bu çalışmada hakem olarak görev alan araştırmacılar, 40 yaşından daha genç olmakla birlikte, epidemiyoloji ya da istatistik alanlarında özel eğitimli kişiler değildi. Uyumun sağlanması için bir kullanma kılavuzu şeklinde el kitapçığının hazırlanması, her bir parametrenin örneklerle detaylı açıklandığı makalelerin yayınlanması ve subjektif özellikteki parametrelere mümkün olduğunca daha az yer verilmesi gibi yaklaşımlar bulunmaktadır (8, 10, 13, 14). Buna karşın, kongrelere kabul edilen ve reddedilen bildirilerin değerlendirme skorları arasında da anlamlı farklar tespit edilebilmektedir (7, 9, 12). Dolayısıyla, kullanılmakta olan değerlendirme sistemleri, hakemler arası uyumsuzluğa rağmen bildirilerin incelenmesinde etkin bir yaklaşım olarak öne çıkmaktadır (7, 14).

Makale ya da bildiri özeti değerlendirilmesi için bir kontrol listesi hazırlanması sürecinde, mevcut araçlarda bulunan kalite ile ilgili parametreler belirlenmekte, özel yöntemler kullanılarak geniş katılımlı uyum toplantıları yapılmaktadır (2, 4, 9). Üzerinde anlaşılan parametreler, belirli aralıklarla gözden geçirilmektedir. Ayrıca STROBE gözlemsel çalışmalar için kullanılan değerlendirme sisteminin başka bir dile tercüme edilmesi sürecinde, kendi merkezleri ile önceden koordinasyona geçilmesi önerilmektedir. Yapılan karşılıklı uyum çalışmaları neticesinde STROBE ve CONSORT kriterlerinin Türkçe tercümeleri yayımlanmıştır (15, 16). Bunun yanında, internet sayfası üzerinden herkese açık eleştiri ve katkıların alındığı bir sistem haline getirilmiştir (3, 10). Dolayısıyla, ulusal bazlı bir kongre bildiri değerlendirme sisteminin yaygın kullanıma girmesi için geniş katılımlı gözden geçirme ve geliştirme uyum toplantılarına ihtiyaç duyulmaktadır.

Literatürde CONSORT ve STROBE gibi tanımlanmış ve oluşumunda özel işlemlerin uygulandığı değerlendirme sistemleri olduğu gibi, sadece kongrelere özel olarak uygulanmış değerlendirme araçlarında da rastlanmaktadır (7, 14). Hangi sistem ile gerçekleştiğinden daha çok herhangi bir sistem ile kongre bildiri özetlerinin değerlendirilmesinin önemli bir konu olduğu düşünülmektedir.

CONSORT ve STROBE değerlendirme sistemleri ile ilgili kriterlerin tarif ve ayrıntılı açıklamasını içeren makalelerin de olduğu bilinmektedir (10, 13). Değerlendirme sistemlerinin açıklayıcı makalelerle birlikte kullanımı önerilmektedir (4). Bu yaklaşım, elde edilen skorun daha yol gösterici olmasına katkısı olduğu gibi, hakemler arası uyumun artmasında da etkili olabilir.

Çalışma Kısıtlamaları

Randomize klinik çalışmalara yönelik bildiri sayısının az olmasından dolayı değerlendirmeye sadece gözlemsel çalışmaların alınması, bildiri özetlerinin değerlendirmesini yapan hakemlerin istatistik ve epidemiyoloji alanında özel bir eğitim almamış olmaları, sistemlerin farklı maksimum skorları olması nedeniyle, sistemler arası korelasyon analizinin etkin şekilde değerlendirilememesi ve yorumlama sıkıntısı çalışmanın genel kısıtlamaları olarak değerlendirilmiştir.

SONUÇ

Geliştirilmeye ve ulusal temelli kullanıma girmesi beklenen UDS'nin kongre bildiri özetlerinin değerlendirilmesi için uygun bir yöntem olduğu düşünülmektedir. Önerilen sisteme eleştiri ve katkıların alınabilmesi açısından, geniş katılımlı değerlendirme toplantılarına ve sistemi değerlendiren çalışmalara ihtiyaç duyulmaktadır. Hakemler arası uyumun artırılması ve uygulama kolaylığı açısından bir kullanma kılavuzu yayınlanmalıdır. Çalışma tipine göre farklı çeşitlerinin düzenlenmesinin, uygulamada kolaylığa yol açacağı düşünülmektedir.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – M.H., F.B.; Tasarım – M.H., F.B.; Denetleme – M.H., F.B.; Kaynaklar – A.A., A.Ş.; Malzemeler – A.Ş., A.A.; Veri Toplanması ve/veya İşlemesi – M.H., F.B., A.A., A.Ş.; Analiz ve/veya Yorum – M.H., F.B.; Literatür Taraması – M.H., F.B., A.Ş., A.A.; Yazıyı Yazan – M.H., F.B.; Eleştirel İnceleme – M.H., F.B., A.A., A.Ş.; Diğer – A.A., A.Ş.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – M.H., F.B.; Design – M.H., F.B.; Supervision – M.H., F.B.; Resources – A.A., A.Ş.; Materials – A.Ş., A.A.; Data Collection and/or Processing – M.H., F.B., A.A., A.Ş.; Analysis and/or Interpretation – M.H., F.B.; Literature Search – M.H., F.B., A.Ş., A.A.; Writing Manuscript – M.H., F.B.; Critical Review – M.H., F.B., A.A., A.Ş.; Other – A.A., A.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Ek 1. STROBE özet değerlendirme sistemi

No	Parametre	Açıklama
1	Başlık	Başlıkta yaygın olarak kullanılan terimlerle (örnek olarak kohort, vaka-kontrol, kesitsel) çalışma tasarımının belirtilmesi
2	Yazarlar	Sorumlu yazar için iletişim detayları
3	Çalışma tasarımı	Çalışma tasarımının tanımlanması (örnek olarak kohort, vaka-kontrol, kesitsel)
4	Amaç	Özel amaçlar ya da hipotez.
5	Ayarlama	Ayarlamanın, takip sürelerinin ya da sonuçların oluştuğu ya da olduğu zamanların, bunlara ek olarak sonuçlar için diğer zaman dilimlerinde her bir nokta ya da aralıkların (örnek olarak 18 yaştaki prevalans, 1998-2007) açıklanması.
6	Katılımcılar	*Kohort çalışma*-en önemli uygunluk kriterlerinin, ve en önemli katılımcı seçimi kaynak ve yöntemlerinin verilmesi. Takip yöntemlerinin kısaca açıklanması. Vaka-kontrol çalışması-esas uygunluk kriterlerinin verilmesi, vaka tespiti ve kontrol seçim yöntemleri ve esas kaynaklarının verilmesi *Kesitsel çalışma*-uygunluk kriterlerinin verilmesi ve katılımcıların seçim yöntemleri ve esas kaynaklarının verilmesi *Kohort çalışma*-eşli çalışmalar için, maruz kalan ve kalmayanların sayı ve eşleşmelerinin verilmesi Vaka-kontrol çalışması-eşli çalışmalar için, eşleşme kriterleri ve vaka başı kontrollerin sayılarının verilmesi
7	Değişkenler	Bu yazı için primer sonucun açık bir şekilde tanımlanması.
8	İstatistiksel yöntemler	Şaşırtıcılar için kontrol için kullanılanlar dahil istatistiksel yöntemlerin açıklanması.
9	Katılımcılar	Çalışmanın başlangıcında ve bitimindeki katılımcı sayılarının rapor edilmesi.
10	Ana bulgular	İlişkilerin bağlantılarının rapor edilmesi. Uygun ise, anlamlı bir zaman dilimi içerisinde göreceli (rölatif) risk tahminlerinin kesin riske çevrilebilmesinin dikkate alınması. Belirsizlik ve değişkenlik uygun ölçümlerinin (örnek olarak güven aralığı ile birlikte odds oranı)
11	Sonuçlar	Çalışma sonuçlarının genel yorumu.

Ek 2. Timmer özet değerlendirme aracı

No	Parametre
1	Soru/amaç yeterince tanımlanmış mı?
2	Çalışma sorusunun cevaplanması için tasarım apaçık ve uygun mu?
3	Katılımcı karakteristik özellikleri yeterince tanımlanmış mı?
4	Katılımcılar çalışma sorusu için uygun mu?
5	Katılımcı seçim yöntemi tanımlanmış ve uygun mu?
6	Sonuç ölçümü iyi tanımlanmış ve ölçüm önyargısına (bias) dayanıklı mı? Ölçme ve değerlendirme araçları bildirilmiş mi?
7	Şaşırtıcıların sebebi açıklanmış mı?
8	Örneklem büyüklüğü yeterli mi?
9	İstatistiksel olarak anlamsız sonuçlar için post hoc güç hesaplamaları ya da güven aralıkları rapor edilmiş mi?
10	İstatistiksel analizler uygun mu?
11	İstatistiksel testler belirtilmiş mi?
12	Kesin p değerleri ve güven aralığı belirtilmiş mi?
13	Katılımcıların kaybı ve kayıp gerekçesi rapor edilmiş mi?
14	Bulgular yeterli detayda rapor edilmiş mi?
15	Bulgular sonuçları destekliyor mu?
	Randomize kontrollü çalışmalar için değerlendirmeye alınan ilave parametreler:
16	Kontrol kullanılmış mı ve uygun mu? (Kontrol yok ise hayır işaretlenmeli).
17	Tedavi gruplarına rastgele dağıtım imkan dahilinde ise, bu tanımlanmış mı? (İmkan dahilinde değilse uygulanamaz seçeneğini işaretleyin).
18	Araştırmacıların girişimlere körlüğü imkan dahilinde ise, bu durum tanımlanmış mı? (İmkan dahilinde değilse uygulanamaz seçeneğini işaretleyin).
19	Katılımcıların girişimlere körlüğü imkan dahilinde ise, bu durum tanımlanmış mı? (İmkan dahilinde değilse uygulanamaz seçeneğini işaretleyin).

Ek 3. Ulusal değerlendirme sistemi

No	Grup	Parametre
1	Başlık	Başlık içerisinde yaygın olarak kullanılan terimlerle (örnek olarak randomize kontrollü, kohort, vaka-kontrol, kesitsel, vaka serisi, vaka sunumu) çalışma tasarımının belirtilmesi
2	Yazar	Sorumlu yazar için e-posta adresi dahil iletişim detaylarının olması ve çalışmayı gerçekleştiren Kurum/Hastane/Klinik adının bildiri özeti içerisinde yer almaması
3	Amaç	Soru/amaç/hipotezin tanımlanması
4	Yöntem	Çalışma tipi ve tasarımının çalışma sorusu/amaç/hipotezin cevaplanmasına uygun olması
5		Katılımcı uygunluk kriterleri, seçimi, kaynak ve yöntemlerinin tanımlanması
6		Tedavi gruplarına planlanan müdahaleler
7		Takip sürelerinin ya da sonuçların oluştuğu zaman dilimlerinin verilmesi
8		Değişkenlerin ve esas sonucun tanımlanması
9		Çalışmanın başlangıcında ve bitimindeki katılımcı sayılarının ve kayıp gerekçelerinin verilmesi
10	İstatistik	İstatistiksel yöntemler, kesin p değerleri veya güven aralığı belirtilmesi
11	Bulgular	Bulguların detaylı ve amaç/hipoteze yönelik şekilde rapor edilmesi
12	Sonuç	Sonuçların amaç/hipotezi destekleyecek şekilde yorumlanması
13		Sonuçların elde edilen bulgularla uyumlu olması Randomize kontrollü çalışmalar için değerlendirmeye alınan ilave parametreler:
14	Yöntem	Kontrol grubunun –imkan dahilinde ise- kullanımı, tanımlanması
15	Yöntem	Tedavi gruplarına randomize dağıtımın ve yönteminin -imkan dahilinde ise- tanımlanması
16	Yöntem	Araştırmacıların, katılımcıların ve sonuçları değerlendirenlerin girişimlere körlüğünün -imkan dahilinde ise- tanımlanması

Ulus Cerrahi Derg 2016; 32: 275-280
DOI: 10.5152/UCD.2016.3122

Endoscopic stenting for laparoscopic sleeve gastrectomy leaks

Laparoskopik sleeve gastrektomi sonrası gelişen kaçakların tedavisinde endoskopik stent

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ABSTRACT

Objective: Laparoscopic sleeve gastrectomy is a widely accepted and effective bariatric surgery method. The rate of leakage at the staple-line has been reported to be between 1.5 and 5%. Aside from the use of percutaneous drainage, re-laparoscopy, or abdominal sepsis control by laparotomy, endoscopic esophagogastric stent placement is increasingly preferred as a treatment method. Because laparoscopic sleeve gastrectomy is a widely used modality in our hospital, we aimed to evaluate the rate of leaks and the results of stent placements in our patients.

Material and Methods: Between January 1st 2010 and August 31st 2014, laparoscopic sleeve gastrectomy was performed on 236 patients by three surgeons. The demographic information and postoperative discharge summaries were collected and analyzed with the permission of the hospital ethics committee. Information about leak treatment management was also collected.

Results: Leaks after laparoscopic sleeve gastrectomy in four patients were stented in the first postoperative month. Short (12 cm) Hanora® (M.I.Tech, Gyeonggi-do, Korea) self-expandable coated stents were placed in two patients, and long (24 cm) Hanora® self-expandable coated stents were placed in the other two. The stents were removed after one month in two patients, two and a half months later in one, and five months later in another patient. The leaks were demonstrated to be healed in all patients after stent removal. Endoscopic stent revision was performed in one patient due to migration of the stent and in another for stent breakage.

Conclusion: The success rate of treatment of leaks after laparoscopic sleeve gastrectomy by stent placement has been variable in the literature. The success in early stent placement has been shown to be related to physician expertise. According to the results of our patients, we suggest that endoscopic stent placement in the early stage after controlling sepsis is an effective method in the management of leaks.

Keywords: Complications, endoscopic, fistula, laparoscopic sleeve gastrectomy, leak, management, stent

ÖZ

Amaç: Laparoskopik sleeve gastrektomi kısa ve orta vadeli sonuçları başarılı olan ve teknik olarak kolay olduğu kabul edilen popüler bir bariatrik cerrahi yöntemidir. Laparoskopik sleeve gastrektomi sırasında oluşturulan uzun stapler hattından gelişen kaçakların oranı, artık yerleşen teknik tecrübeye rağmen, %1,5-5 arasında devam etmektedir. Bu kaçaklar sonucu oluşan abdominal sepsisin kontrolünde perkütan drenaj, re-laparoskopi veya laparotominin yanısıra endoskopik olarak yerleştirilen silikon ile kaplı stent uygulaması da kullanılabilecek bir yöntem olarak dikkat çekmektedir. Laparoskopik sleeve gastrektomi hastanemizde bariatrik cerrahi için tercih edilen yöntem olup oluşan kaçak oranımız ve bunların yönetimi sunulmaktadır.

Gereç ve Yöntemler: 1 Ocak 2010-31 Ağustos 2014 tarihleri arasında morbid obezite nedeniyle üç cerrahi uzmanı tarafından opere edilen 236 hastanın kayıtları retrospektif olarak tarandı, demografik bilgileri ve postoperatif taburculuk özelliklerine ulaşıldı. Kaçak oluşmuş olan hastalarda kaçakların yönetimi ortaya kondu.

Bulgular: Abdominal sepsis kontrolünü takiben dört hastaya post-operatif 1. ayda endoskopik Hanora® stent (M.I.Tech, Gyeonggi-do, Kore) uygulanmıştır.İki hastaya 12 cm' lik (kısa) kaplı kendi açılabilen stent uygulanırken , iki hastaya da 24 cm'lik (uzun) kaplı, kendi açılabilen stent takılmıştır. İki hastada bir aylık stent uygulaması sonrası kaçak kapanması sağlanabilirken, diğer hastalardan birinde stent migrasyonu nedeniyle, diğerinde ise stantin kırılması nedeniyle endoskopik stentleme revizyonu gerekmiştir.

Sonuç: Endoskopik stent uygulamaları ile laparoskopik sleeve gastrektomi sonrası kaçakların kontrolünde elde edilen sonuçlar değişkenlik göstermektedir. Erken dönemde stent kullanılması ile başarı sağlanması hekim tecrübesi ile ilişkili görülmektedir. Sonuçlarımıza göre, sepsisin kontrol altına alınmasını takiben erken dönemde stent takılması kaçak yönetiminde başarılı bir metottur.

Anahtar Kelimeler: Komplikasyon, endoskopi, fistül, laparoskopik sleeve gastrektomi, kaçak, yönetim, stent

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Received / *Geliş Tarihi*: 22.02.2015
Accepted / *Kabul Tarihi*: 19.05.2015
Available Online Date / *Çevrimiçi Yayın Tarihi*: 27.10.2016

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Laparoscopic sleeve gastrectomy (LSG) is accepted as a successful stand-alone surgical treatment for obesity (1, 2). Surgery is an effective method to decrease excessive weight and improve survival against obesity-related morbidity and mortality (3). LSG provides continuity of the gastrointestinal system and maintains the antrum, thus preventing dumping syndrome. It also does not leave foreign material within the patient, such as with gastric banding (4). Due to these advantages and the relative simplicity of the procedure, surgeons use LSG more frequently than the other methods. However, the procedure is not free of complications. Bleeding, strictures, and staple-line leaks may occur. The rate of staple-line leaks

varies between 1.5 -5.3% of all patients who undergo the LSG procedure, and if the leak is not detected quickly and managed properly, the patient may experience abdominal sepsis or even death (2).

Stents have been used in the gastrointestinal system for a long time. Covered self-expandable metallic stents (CSEMS), designed for bariatric surgery, are the new armamentarium of the endoscopist in the management of staple-line leaks (5-7).

Because LSG is a widely used modality in our hospital, we aimed to evaluate the efficiency of self-expandable coated stents in the treatment of leaks.

MATERIAL AND METHODS

Between January 1st 2010 and August 31st 2014, LSG was performed on 236 patients by three surgeons in a single surgery unit. Written informed consent was obtained from each patient. Data regarding demographic and anthropometric characteristics, operation discharge summaries, and leak treatment management were extracted and analyzed with the permission of the Fatih Sultan Mehmet Training and Research Hospital Ethics Committee, Istanbul.

Surgical Procedure

A 5-trocar technique was employed for LSG. A midline epigastric 12 mm optical trocar was inserted 25 cm from the xiphoid process. Next, under laparoscopic view, 2 working trocars were inserted (5 mm on the left and 12 mm on the right) on each mid-clavicular line just above the optic trocar level. A sub-xiphoid 5 mm trocar was used to elevate the left lobe of the liver, and a 5 mm anterior axillary subcostal trocar was used to retract the stomach. The omentum was liberated from the greater curvature with the help of a vessel sealing device. Starting 5 cm proximally from the antrum towards 1 cm lateral to the gastro-oesophageal junction, the stomach was divided by a multiple-firing endoscopic linear stapler device. A standard leak test was performed in all LSG patients by instillation of 50 mL standard 0.9% NaCl solution with methylene blue (10 mL methylene blue in 500 mL 0.9% NaCl), and then 50 mL air was given through an oro-gastric tube. A drain was placed in the left lateral quadrant. All the patients in this case series tested negative for leaks. On postoperative (p.o.) day 1, all patients were given an oral methylene blue test and were then placed on a clear liquid diet. They were discharged on postoperative day 3 under normal circumstances.

Endoscopic Stenting

All endoscopic procedures were performed under deep sedation provided by the anesthesiologist. Endoscopy and stenting were performed using a single channel gastroscope (EG-450 gastroscope; Fujinon, Japan). A stiff but flexible guide wire was placed under direct vision further from the duodenal bulb and was used to introduce the stent. Two different sized stents were used. Either a Hanora® (M.I.Tech; Gyeonggi-do, Korea) CSEMS measuring 24 cm in length and 22 to 30 mm in diameter, which is specially designed for the sleeved stomach, or a 12 cm in length and 22 mm in diameter oesophageal stent was placed. The stents were positioned starting 5 to 10 cm proximal from the point of the detected leak onwards into the stomach if an oesophageal stent was used or into the duodenal bulb if the bariatric stent was used. The final position of the stent was checked as the endoscope passed through.

RESULTS

Staple line leaks were detected in 8 out of 236 patients (3.3%). Leaks were initially managed either by re-laparoscopy aiming to control abdominal sepsis and suture repair of the defect if possible, or by percutaneous drainage and fistula management with total parenteral nutrition (TPN). Primary repair attempts failed in all but one patient whose leak was obvious on p.o. day two. Percutaneous drainage and TPN was required for fifty-five days for the leak to close completely in one patient, while another patient died due to fungal sepsis after two months. Endoscopic self coated stents were applied to the remaining four patients. Characteristics of the patients, symptoms, time until the leak was discovered, management, and stent duration are shown in Table 1.

Case 1

A 34-year-old female was operated on for morbid obesity. Her body mass index (BMI) was 43 kg/m^2. A 1 cm defect that developed in the staple-line near the fundus due to stapler misfiring-misclosure was corrected by re-stapling and incorporating the defect within the removed area of the stomach. The patient complained about difficulty in breathing on p.o. day 1 that worsened with persistent tachypnea and left shoulder discomfort. A computed tomography (CT) scan of the thorax revealed a left pleural effusion and a left basal atelectasis, but no collections were observed in the abdomen. On p.o. day 6, she had to be intubated for respiratory stress and was admitted to the intensive care unit. A second CT

Table 1. Characteristics of the patient with symptoms and time of the leak discovered

Age/Gender	BMI	Symptoms	Time to leak discovered	Management	Stent duration
34/Female	43	Tachypnea, Tachycardia, Left shoulder pain	6 days	Percutaneous drainage, Stent (12 cm)	10 weeks
29/Female	41	Abdominal pain, Nausea-vomiting, Tachycardia	9 days	Re-laparoscopy, Sewing the leak (failed), Stent (12 cm)	28 days
27/Female	43	Abdominal pain, Nausea-vomiting, Tachycardia	10 days	Relaparoscopy, Sewing the leak (failed), Stent (24 cm)	32 days
23/Male	46	Tachypnea, Tachycardia, Left shoulder pain	2 days	Relaparoscopy, Sewing the leak (failed), Stent (24 cm and 12 cm)	50 days

BMI: body mass index

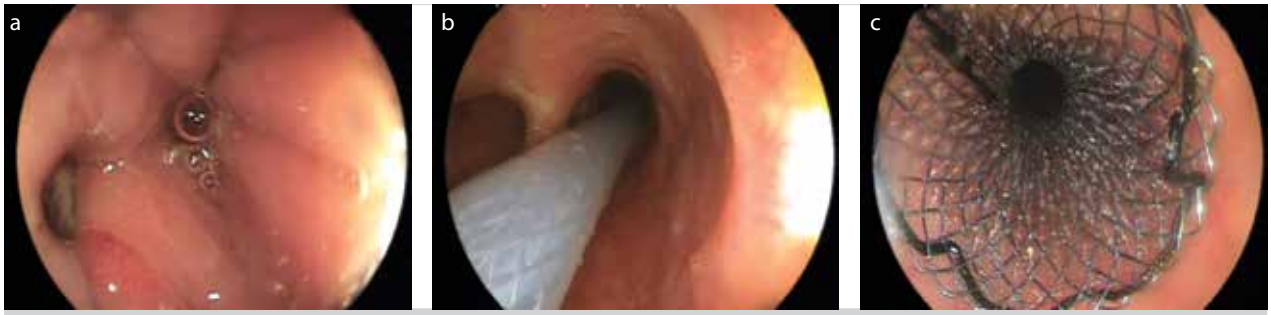

Figure 1. a-c. A staple-line leak near the gastroesophageal junction (a). The stent was introduced over a guide wire placed under direct vision (b). Then, the stent was opened to cover the leak (c)

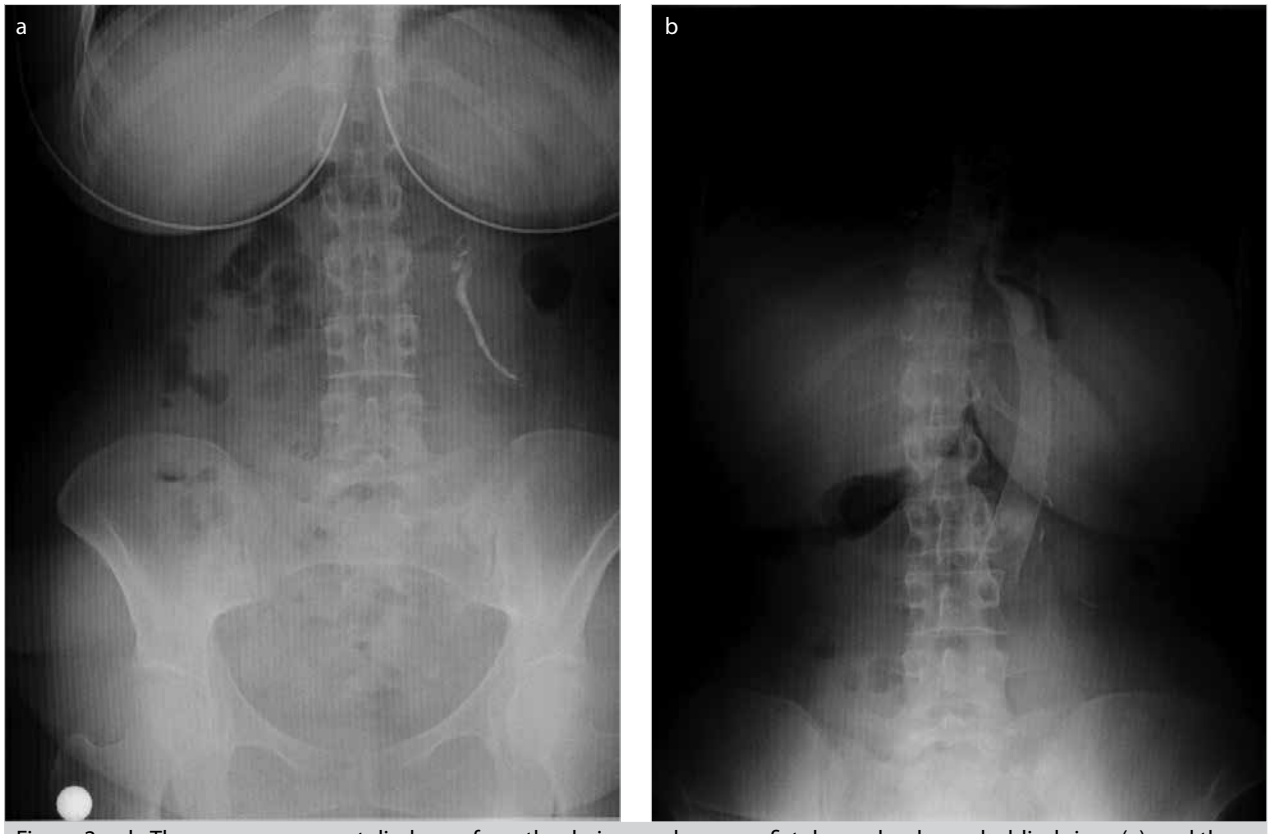

Figure 2. a, b. There was a recurrent discharge from the drain area; however, fistulography showed a blind sinus (a), and the stent was in proper position (b)

showed contrast extravasation and collections around the stomach that were drained percutaneously. Gastroscopy was planned on p.o. day 28 and showed a leak at 38 cm. A 12 cm Hanora® (M.I.Tech; Gyeonggi-do, Korea) oesophageal stent was placed. Two days later, a control endoscopy revealed distal migration of the stent. After repositioning, a second stent was inserted through the first one and was opened just overlying its distal end so that they were overlapping by 2-3 cm. The distal tip of the second stent rested on the antrum. Stents were left in place for 2.5 months and then removed once the leak had healed.

Case 2

A 29-year-old female patient with a BMI of 41.1 kg/m^2 underwent LSG to treat morbid obesity. The patient was discharged three days after the procedure and was placed on a clear liquid diet. She had no complaints at the first week appointment, but two days later, she was admitted to the emergency department with abdominal pain, nausea, tachycardia, and tachypnea. An abdominal CT scan showed contrast extravasation antero-inferiorly around the sleeved stomach near the splenic upper pole. The patient was taken to the operating room for laparoscopic exploration, and a proximal gastric leak was detected near the resected fundus. The opening was sutured, and the abdomen was drained. Due to continuous drainage on p.o day 15, an oesophageal stent was placed to cover a leak at the gastro-oesophageal junction (Figure 1a-c). The stent was removed on the 28th day because of worsening retrosternal pain and odynophagia, and the leak was found to be closed. A serous discharge recurred occasionally at the drain area, but a fistulography showed a dead-end sinus (Figure 2).

Case 3

A 27-year-old female patient underwent LSG to treat morbid obesity (BMI: 43.2 kg/m^2). The surgery was uneventful, and leakage tests were negative. The postoperative period was normal, and she was discharged on p.o. day 3. After a one-week oral intake of the prescribed liquid diet, she complained

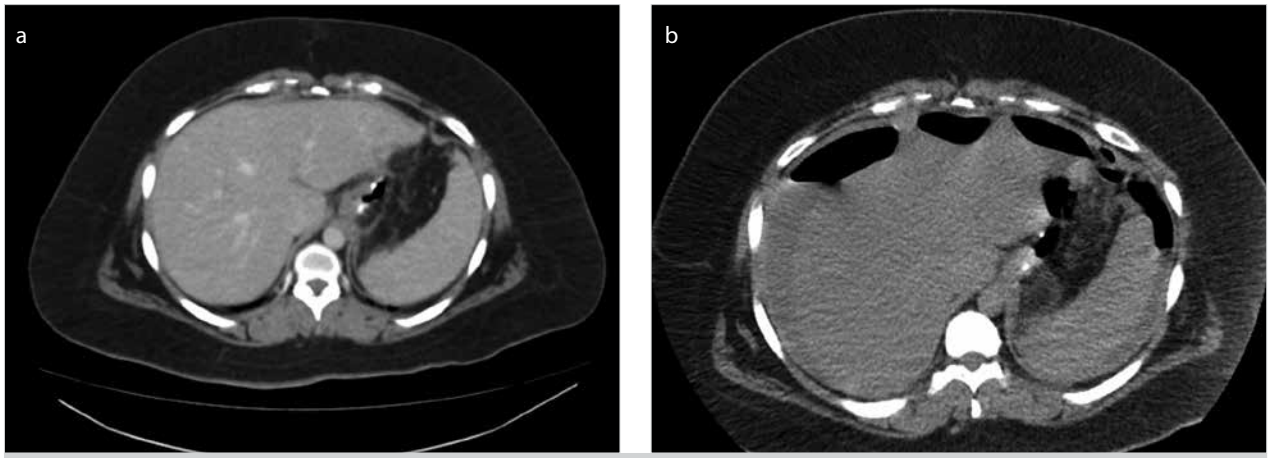

Figure 3. a, b. Initial CT scan showed normal findings (a), but 2 days later, the CT scan detected wide areas of free fluid in the abdomen (b)

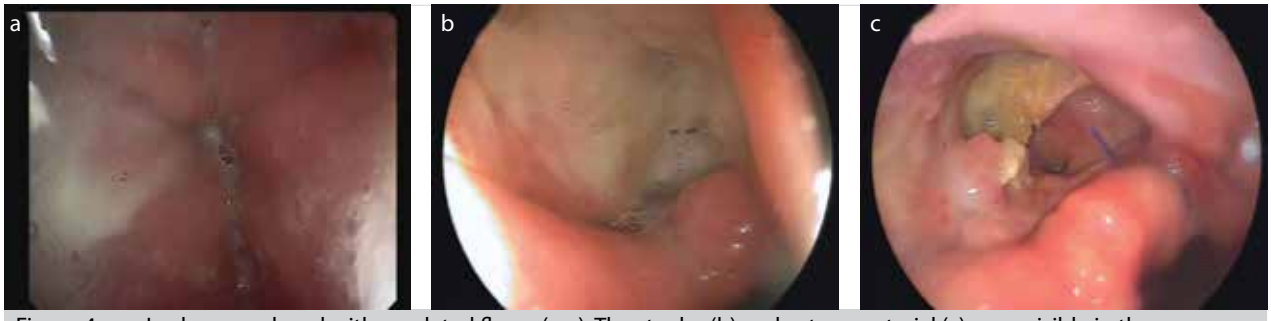

Figure 4. a-c. Leaks were closed with exudated floors (a-c). The stapler (b) and suture material (c) were visible in the oesophageal lumen

of nausea and vomiting and was readmitted to the surgery ward with abdominal pain, low grade fever, and tachycardia. An abdominal CT scan revealed three closed collections, the largest measuring 2 cm in diameter, between the anterior surface of the sleeved stomach and the left lobe of the liver. She was put on broad-spectrum antibiotics and total parenteral nutrition. However, three days later, she deteriorated, and a second abdominal CT revealed widespread fluid in the abdominal cavity (Figure 3). She was taken to the operating room for laparoscopic exploration, and the abdominal cavity was irrigated. Methylene blue tests showed a leak near the proximal stomach close to the gastro-oesophageal area. The omentum was approximated, and an omentoplasty was performed with three interrupted sutures onto the leak. However, suturing failed, and endoscopy revealed a leak at 40 cm. A 24 cm Hanora® (M.I.Tech, Gyeonggi-do, Korea) stent designed for sleeve gastrectomy was introduced under direct vision over a guide-wire to cover the leak from the distal oesophagus to the duodenal bulb. Due to increasing retrosternal discomfort, she was taken back to the gastroenterology unit 15 days later, and the stent was found to have lodged distally even though it was hung by its nasal route wires. It was repositioned, and after one month, the stent was removed to check the leak, which was closed (Figure 4).

Case 4

A 23-year-old male patient underwent an operation to treat morbid obesity (BMI: 46 kg/m^2). The calibrating oro-gastric tube was incidentally compressed between the stapler jaws and cut unintentionally, while applying the stapler to the antrum. The opening was closed by applying another row of staples, and a leakage test showed no extravasation of the dye. The patient was in distress the next day with tachypnea, tachycardia, and upper left shoulder pain. An abdominal CT scan was ordered and revealed widespread abdominal fluid with contrast extravasation. The patient was taken back to the operating room for irrigation and an oesophago-gastric perioperative contrast study, which revealed a dilated oesophagus and a thin contrast passage into the stomach without extravasation. Four days later, he was still under respiratory distress and was febrile with turbid abdominal drainage. Another operation was performed. The methylene blue test found a fundic leak that was sewn up with interrupted 2/0 absorbable sutures. However, suturing did not reduce the drainage. Twenty-five days after the initial LSG operation, he was found to have a leak at 45 cm, just 3 cm beyond the gastro-oesophageal function. A Hanora® (M.I.Tech, Gyeonggi-do, Korea) stent designed for sleeve gastrectomy was placed that decreased the drain output effectively. Although the stent was secured through nasal slings around the auricle as a spectacle, it was found to migrate distally and was repositioned after 10 days. However, the drain output continued to increase, and we decided to remove the 'non-functioning' stent after 20 days. The stent was found to be kinked in the incisura angularis, and the silicon coating in the kinked part was defective. Due to the migration problem, this error could not be properly prevented even with the slings and probable kinking. We chose to recover the leak with a shorter 12 cm long, 22 mm diameter coated stent. The patient tolerated feeding without increased leak output, and 30 days after the second stenting, we removed the stent and found the leak to be healed.

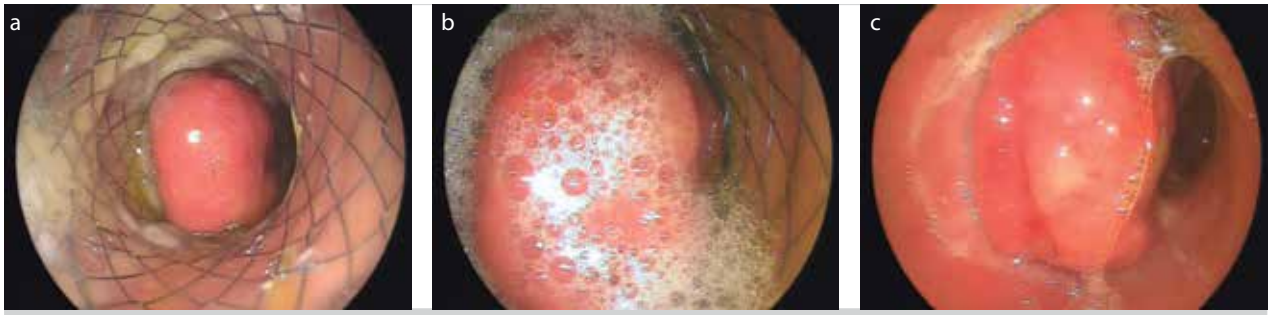

Figure 5. a-c. Mucosal ingrowth through the distal portion of the stent

DISCUSSION

Despite the technical simplicity of the procedure, staple-line leaks are life-threatening complications that occur in approximately 5% of LSG cases (8-10). Symptoms may be gradual or sudden. Different methods of management have been used to treat the leaks. Patients need to be put on broad-spectrum antibiotics and total parental nutrition, and their collections should be drained either percutaneously or surgically. Leaks can be defined as early (1-3 days p.o.), intermediate (4-7 days p.o.), or late (after 8 days p.o.), and suturing of the leaks did not provide success in case series in either early or intermediate term (9, 11).

Covered self-expandable metallic stents have gained popularity in the management of leaks with variable results (5-10, 12). In our study, we obtained complete closure of the leaks by using variable length SECS. Serra et al. (13) used CSEMS in 5 patients and reported leak closure in four of them. They also used a wall stent in another patient, but due to the mucosal enlargement through the stent and resulting obstruction, they had to perform a total gastrectomy. In another small case series by Casella et al. (14), complete healing occurred in 3 patients with staple-line leaks by using CSEMS. Additionally, in the largest case series, Tan et al. (7) reported a 50% closure rate.

Different sizes and lengths of CSEMS are available. There are also custom tailored stents for bariatric surgery. Galloro et al. (5) reported a mega stent in four patients and closure of the leaks within a shorter period of time and with less intolerance. Additionally, they did not report any stent migration. We also used tailored-to-fit sleeved stomach stents in 2 patients. These new stents were placed from the distal oesophagus above the leak to the duodenal bulb where they were seated. The proximal diameter of the stents in the oesophageal part was 22 mm, and the distal stomach part had a diameter of 30 mm so that the leak area was bypassed and the stent would have difficulty to migrate distally. Unfortunately, larger stents did not prevent migration. Although the long stents we used had additional anchoring wires, they migrated as the short stents did. Stent migration has been reported frequently in the literature and is a complication that requires re-interventions (8, 15). In our patients who encountered stent migration, we either had to change or reposition them.

Kinking was another significant problem with long stents. Kinking was diagnosed when we noticed increased drainage and we had to change the stent. Mucosal ingrowth through the distal portion of the stent was observed in both patients treated with long stents (Figure 5). Patients who remained asymptomatic raise the question of whether ingrowth has any clinical implication or not. The clinical importance of this problem should be assessed in larger case series.

CONCLUSION

This case series showed that staple-line leaks after LSG can be successfully managed by using CSEMS following the timely control of abdominal sepsis. Further prospective studies including larger number of patients are needed in order to explore the benefits and complications of stents in staple-line leaks after LSG.

Limitations of our study include the retrospective design and small patient population. There were not enough patients to adequately compare short and long stents in terms of complications and effectiveness. Such comparisons need to be assessed in larger case series.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Fatih Sultan Mehmet Training and Research Hospital.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - M.T.A., Y.Ö.A., O.A.; Design - M.T.A., Y.Ö.A.; Supervision - M.T.A., Y.Ö.A.; Resources - O.A., B.K., Y.İ.; Data Collection and/or Processing - M.T.A., O.A.; Analysis and/or Interpretation - M.T.A., Y.Ö.A., O.A.; Literature Search - M.T.A., O.A.; Writing Manuscript - M.T.A.; Critical Review - Y.Ö.A., K.M., E.O.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Komite Onayı: Bu çalışma için etik komite onayı İstanbul Fatih Sultan Mehmet Eğitim ve Araştırma Hastanesi'nden alınmıştır.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastalardan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - M.T.A., Y.Ö.A., O.A.; Tasarım - M.T.A., Y.Ö.A.; Denetleme - M.T.A., Y.Ö.A.; Kaynaklar - O.A., B.K., Y.İ.; Veri Toplanması ve/veya İşlemesi - M.T.A., O.A.; Analiz ve/veya Yorum - M.T.A., Y.Ö.A., O.A.; Literatür Taraması - M.T.A., O.A.; Yazıyı Yazan - M.T.A.; Eleştirel İnceleme - Y.Ö.A., K.M., E.O.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 281-284
DOI: 10.5152/UCD.2016.3232

Esophageal transection
Özofagus transeksiyonu

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ABSTRACT

Herein, a case of intramural esophageal dissection is reported and the literature is reviewed. Intramural esophageal dissection is a rare but well described condition that is characterized by a laceration between the esophageal mucosa and submucosa but without perforation. A female patient aged 86 years was hospitalized with a diagnosis of abdominal aortic aneurysm. After placement of an aortic stent, she was started on intravenous heparin. After the procedure, the patient had retching and vomiting due to sedative drugs. On the first day after the procedure, the patient experienced sudden-onset chest pain, hematemesis, back pain and odynophagia. A hematoma was detected in the thoracic esophagus, which was opened during endoscopy and began to bleed suddenly owing to air insufflation. A false lumen was visualized within the esophagus. There was no perforation. The patient was followed up conservatively and discharged from the hospital uneventfully. In conclusion, we propose that esophageal transection, a condition that is widely regarded as relatively benign in the literature, has the potential to lead to perforation. It would be expected that most cases of esophageal transection would be managed conservatively.

Keywords: Esophagus, esophagus transection, transection

ÖZ

İntramural özofagus diseksiyonu, özofagus mukoza ve submukoza arasında perforasyon olmadan görülen ve nadir saptanan bir laserasyon varlığıdır. Bu makalede 86 yaşında abdominal aort anevrizması tanısı ile hastaneye yatırılan ve aorta stent takılan bir kadın hastadan bahsedilmektedir. Hastaya aort stenti sonrası intravenöz heparin infüzyonu başlanmıştır. Ameliyat sonrası hastada öğürme ve sedatif ilaçlara bağlı kusma görülmüş ve ameliyat sonrası ilk günde şiddetli göğüs ağrısı, hematemez, sırt ağrısı ve yutma güçlüğü gelişmiştir. Endoskopi sırasında özofagusta hematom saptanmış ve işlem sırasında hematom açılarak kanamaya başlamıştır ve özofagusta yalancı bir lümen gelişmiştir. Herhangi bir perforasyon bulgusu saptanmamıştır. Hasta konservatif takip edilmiş ve sorunsuz taburcu edilmiştir. Özofagus transeksiyonu, özofagusta perforasyona neden olabilecek çoğunlukla benign bir durumdur. Bu olgular perforasyon bulgusu yok ise, konservatif olarak takip ve tedavi edilebilirler.

Anahtar Kelimeler: Özofagus, özofagus transeksiyonu, transeksiyon

INTRODUCTION

Esophageal transection (ET) refers to the disintegration of the esophageal mucosa and submucosa layers. This disease affects a long segment and is not accompanied by perforation. Esophageal transection is a rare disease (1). Generally, it is seen in the 7th and 8th decades and commonly observed in women. The most common symptoms are sudden retrosternal pain, hematemesis, odynophagia, dysphagia and back pain. Esophageal transection diagnosis is made by imaging techniques such as upper gastrointestinal tract endoscopy and computed tomography (CT). Marks and Keet (1) first described ET in 1968. Another name for ET is intramural dissection of the esophagus. The etiology of ET is unclear. To date, it has been reported in patients with coagulopathy, who have undergone a visceral injection for sclerotherapy, during endoscopic instrumentation, after ingestion of a hard foreign body, due to eosinophilic esophagitis, as well as spontaneous occurrence (2). Conservative treatment is thought to be sufficient for the management of ET (1).

In this article, we present a patient who developed an ET while heparinized after undergoing stenting for an abdominal aortic aneurysm.

CASE PRESENTATION

A female patient aged 86 years was hospitalized after being diagnosed with abdominal aortic aneurysm. During follow-up the aneurysm increased in size and an angiography-stenting was performed while the patient was sedated. After placement of a stent to the aorta, intravenous heparin was started. After the operation the patient had retching and vomiting due to sedative drugs. On the first day after procedure, the patient experienced sudden-onset chest pain, hematemesis, back pain and odynophagia. The patient was hemodynamically stable and her hemoglobin and hematocrit levels were within normal range. The heparin infusion was discontinued and an upper-gastrointestinal tract endoscopy was performed. A hematoma was detected in the thoracic esophagus. When the hematoma was opened during the procedure it began to bleed suddenly owing to air insufflation. A false

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Received / *Geliş Tarihi*: 22.07.2015
Accepted / *Kabul Tarihi*: 29.08.2015

Available online at
www.ulusalcerrahidergisi.org

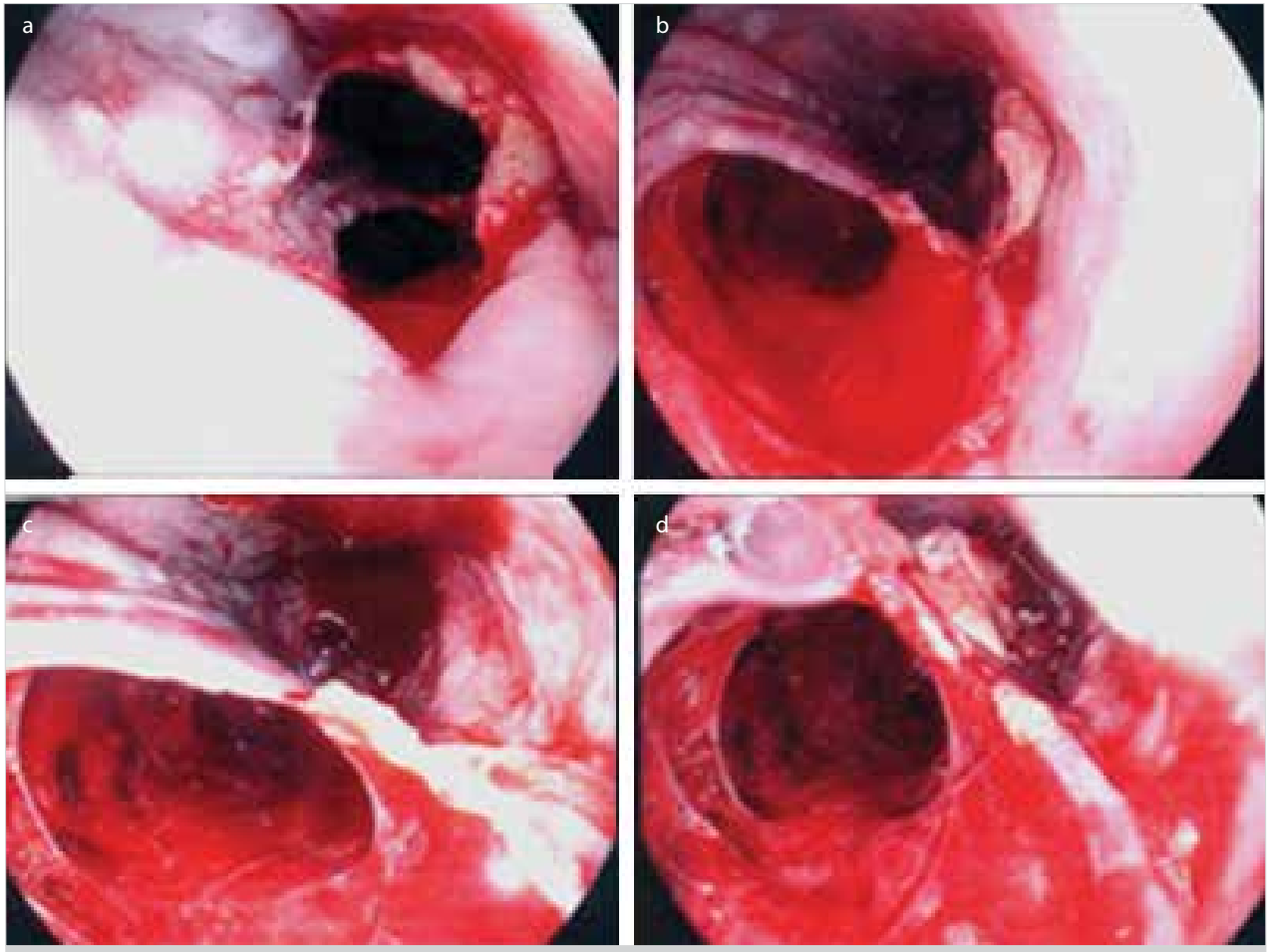

Figure 1. a-d. The double-lumen appearance of the esophagus

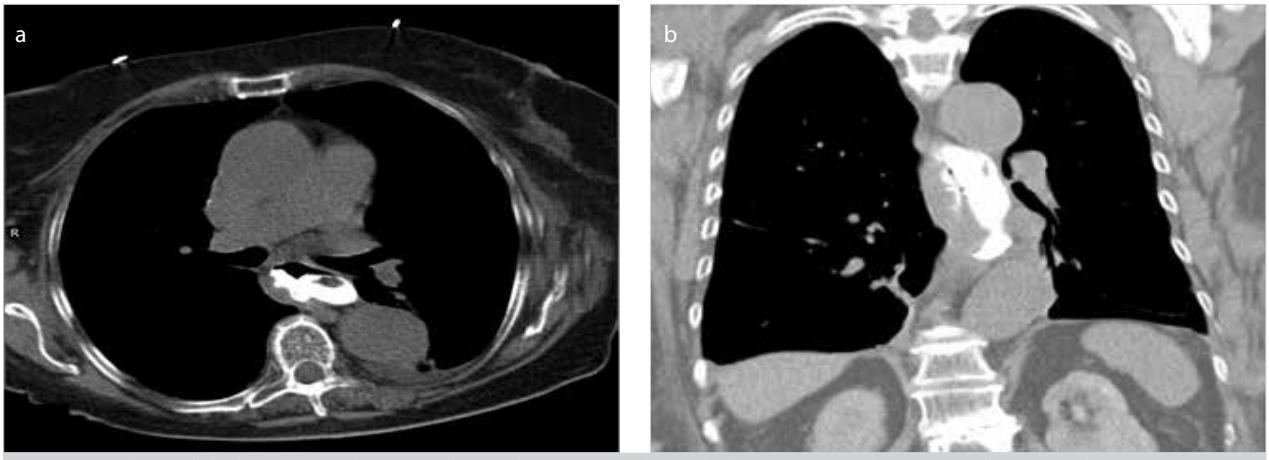

Figure 2. a, b. Double-lumen esophagus at the oral contrast-enhanced chest computed tomography scan. There was no mediastinal free air and contrast extravasation

lumen had occurred in the esophagus. The distal esophagus was ecchymotic. Contrast-enhanced chest CT was performed first due to the suspicion of esophageal perforation. There was no mediastinal free air or contrast extravasation seen in the CT scan. A double-lumen was detected in the esophagus (Figure 1a-d). Subcutaneous emphysema did not occur in the patient. Esophageal perforation was ruled out clinically and the patient's oral nutritional intake was stopped and total parenteral nutrition therapy was started. After this, low-molecular-weight heparin was started.

In the early days, the patient was monitored using oral contrast-enhanced chest CT scan (Figure 2a, b) and with daily chest X-rays. There was no mediastinal free air and contrast extravasation detected and a double-lumen of esophagus was seen on CT scan (Figure 2a, b). The patient's oral intake was stopped on the tenth day and a control oral contrast-enhanced chest CT scan was performed. The double-lumen appearance of the esophagus lumen had disappeared on both the CT scan (Figure 3) and control upper-gastrointestinal tract endoscopy (Figure 4a-d). On the next day, the pa-

tient was started on oral liquid followed by soft food intake. No complaint was observed with fluid intake and oral solid food was started. Total parenteral nutrition was stopped. The patient was discharged uneventfully on the 14th day. An informed consent was obtained from the patient before discharge from the hospital.

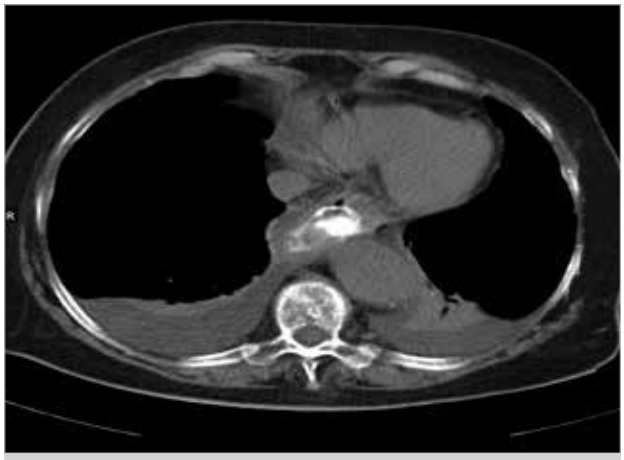

Figure 3. Control chest computed tomography scan, with normal esophageal lumen appearance

DISCUSSION

Two hypotheses have been proposed for the mechanism of esophageal transections. The first of these is that esophageal transections or dissections develop after mucosal bleeds or hematoma (3). The second hypothesis suggests that bleeding of the esophageal mucosa develops into an esophageal transection or dissection. In both, a double lumen appearance of the esophagus eventually occurs (4).

The common consensus is not to use a barium enema for the initial diagnosis; however, orally ingested contrast medium can also be used for magnetic resonance imaging or CT scans, which is helpful both to verify the diagnosis and to exclude other pathologies (5). We believe that upper-gastrointestinal tract endoscopy should be the first diagnostic method conducted to patients who have upper gastrointestinal tract bleeding, bearing in mind the possibility of an esophageal dissection. This is because endoscopy is used both for the treatment and diagnosis of upper gastrointestinal tract bleeding.

Once the diagnosis of esophageal transection is confirmed, conservative management of the condition with reversal of anticoagulation, parenteral nutrition and analgesia should be undertaken (6, 7). Spontaneous complete recovery of the mucosal tear and absorption of hematoma usually takes 1-3 weeks. In the literature the complete healing time has been reported as three weeks (5).

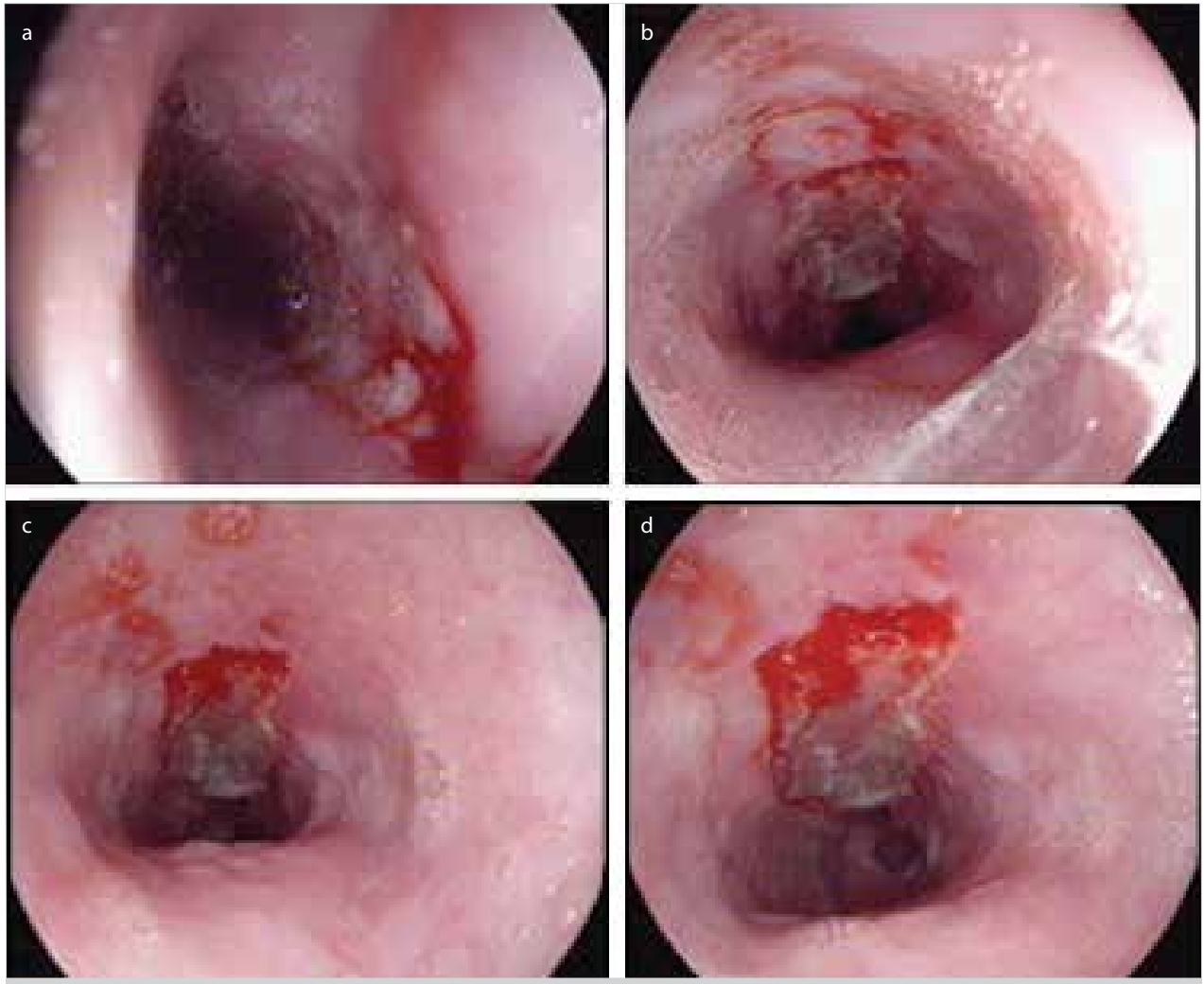

Figure 4. a-d. Double-lumen esophagus image disappeared in the control upper gastrointestinal tract endoscopy on the 10th day

Endoscopic therapies have been used to treat intramural esophageal dissection if it is resistant to conservative treatment, including incision of the septum between the true and false lumens, balloon dilatation, transection of the true esophageal wall, and metallic stent insertion (8). Surgery should be reserved for cases that do not resolve with conservative management or that have complications, such as esophageal perforation or ongoing hemorrhage (9). Although esophageal transection does not carry any long-term sequel, repeat imaging should be considered to confirm the resolution of esophageal transection and exclude any underlying malignant pathology**.** Healing was observed during the control endoscopy that we performed on the 10th day, consequently the patient was allowed to start soft food intake on the same day.

CONCLUSION

We propose that esophageal transection, a condition that is widely regarded as relatively benign in the literature, has the potential to lead to perforation. It would be expected that most cases of esophageal transection would be managed conservatively.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – B.Ö.; Design – B.Ö.; Supervision – A.İ.; Resources – K.T.; Materials – S.D.; Data Collection and/or Processing – F.Y.; Analysis and/or Interpretation – K.D.P., H.Ş.; Literature Search – K.D.P.; Writing Manuscript – B.Ö.; Critical Review – B.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir – B.Ö.; Tasarım – B.Ö.; Denetleme – A.İ.; Kaynaklar – K.T.; Malzemeler – S.D.; Veri Toplanması ve/veya İşlemesi – F.Y.; Analiz ve/veya Yorum – K.D.P., H.Ş.; Literatür Taraması – K.D.P.; Yazıyı Yazan – B.Ö.; Eleştirel İnceleme – B.Ö.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 285-286
DOI: 10.5152/UCD.2015.2861

İdiyopatik çekal ülser ve insidental apendiks karsinoid tümörü birlikteliği

Co-existence of idiopathic cecal ulcer and incidental appendix carcinoid tumor

Volkan İnce, Bora Barut, Serdar Karakaş

ÖZET

İdiyopatik çekal ülser (İÇÜ) ya da soliter çekal ülser, oldukça nadir karşılaşılan ve kesin tanısı histopatolojik olarak konulan bir klinik durumdur. Çoğu zaman alt gastrointestinal sistem kanaması araştırılırken kolonoskopik biyopsi ile tanı konurken, nadir olarak da akut karın nedeniyle ya da çekumda kitle görüntüsüyle maligniteyi taklit etmesi nedeniyle cerrahi rezeksiyon sonrası tanı konur. Çekal karsinoid tümör, hastalığın nadir sebeplerinden biridir, ancak apendiks karsinoid tümör birlikteliği daha önce bildirilmemiştir. Bu çalışmada, akut apandisit kliniği ile başvuran ve çekumda duvar kalınlaşması saptanan 73 yaşındaki kadın hastaya sağ hemikolektomi yapılıp patoloji sonucu izole çekal ülser ve serozal apse ve eşlik eden apendiks karsinoid tümörü olan olgu sunulmaktadır.

Anahtar Kelimeler: Apse, apandisit, karsinoid tümör, idiyopatik çekal ülser

ABSTRACT

Idiopathic cecal ulcer or solitary cecal ulcer is a rare entity that can only be diagnosed by histopathological evaluation. Generally, it is diagnosed by histolopathological evaluation of biopsy specimens obtained by colonoscopy that is performed for lower gastrointestinal bleeding. It can also be diagnosed after surgical resection performed for acute abdomen or cecal mass mimicking malignancy. Cecal carcinoid tumor is a rare cause of this condition; however, coexistence of cecal ulcer and appendix carcinoid tumor has not been previously reported. In this case, we present a 73-year-old woman who clinically presented as acute appendicitis with cecal wall thickening, underwent right hemicolectomy and was subsequently diagnosed with cecal ulcer, serosal abscess and coexisting appendix carcinoid tumor.

Keywords: Abscess, appendicitis, carcinoid tumor, idiopathic cecal ulcer

GİRİŞ

İdiyopatik çekal ülserler (İÇÜ) ilk olarak Cruveilhier tarafından 1832 yılında tanımlanmıştır (1). Günümüzde soliter çekal ülser olarak da adlandırılmakta olan bu hastalık olgu sunumları ya da az sayıda olgu serileri şeklinde sunulduğu için sağ alt kadran ağrısı ya da akut apandisit ayırıcı tanısında çoğu zaman akılda kalmaz. Perforasyon, masif alt gastrointestinal sistem kanaması, malignite şüphesi şeklinde bir klinik seyir olduğunda cerrahi kaçınılmaz olur (2, 3). Ülsere alanın rezeksizyonu (wedge rezeksiyon) tedavide yeterli olmasına karşın, maligniteyi atlamamak için çoğu cerrah sağ hemikolektomi yapmaktadır (4).

Bu çalışmada akut apandisit kliniği ile seyreden ve subserozal apse formasyonuyla çekum duvarında kitle görüntüsü vererek maligniteyi taklit eden, idiyopatik çekal ülser ve insidental apendiks karsinoid tümör birlikteliği sunulmaktadır.

OLGU SUNUMU

Üç günden beri devam eden sağ alt kadran ağrısı şikayeti ile başvuran 73 yaşındaki kadın hastanın öz geçmişinde özellik yoktu. Fizik muayenesinde genel durumu iyi, koopere ve oryante olan hastanın tansiyon arteryal: 110/65 mm-Hg, nabız: 85 atım/dk, ateş: 37,3°C idi. Karın muayenesinde sağ alt kadranda hassasiyet defans ve rebaund mevcuttu. Laboratuvar değerleri ise lökosit: 15,4 x10^3/mL, Hb: 10,9 gr/dL, rutin biyokimyada özellik yoktu, C reaktif protein: 8,8 mg/dL (0-0,35) idi. Karın ultrasonografide çekumda duvar kalınlığı artmış ve çekumdan mediale uzanan 9 mm çapında aperistaltik barsak ansı izlenen apendikolit olarak raporlanan hastaya karın tomografisi çekildi. Tomografide de ultrasonografi ile aynı bulgular saptandı. Çekumda duvar kalınlaşması, apendiks çapı 9 mm ve periçekal yağlı doku kirli görünümde olup minimal serbest mayi izlenen plastrone apandisit veya malignite olarak raporlandı (Resim 1). Çekal duvar kalınlaşması nedeniyle kolonoskopi yapılan hastanın kolon temizliği yeterli olmadığı için sonuç alınamadı. Karsinoembriyonik antijen ve diğer tümör belirteçleri normal saptandı. Hastanın akut karın kliniği gerilemediği için kolonoskopinin ardından ameliyata alındı. Göbek altı orta hat kesiyle karına girildi, apendiksin normal olduğu görüldü ancak çekumda anti-mezenterik kısımda 3 x 3 cm'lik ele gelen kitle palpe edilmesi nedeniyle sağ hemikolektomi ve yan yana ileotransversostomi yapılmasına karar verildi. Rezeksiyon ve anastomoz sorunsuz tamamlandı, sağ parakolik alana tek dren konuldu ve ameliyat sonlandırıldı. Rezeksiyon materyali kesildiğinde mukozanın inflame görünümde, kitlenin ise çekum duvarında serozal kaynaklı olduğu görüldü (Resim 2). Hasta ameliyat sonrası cerrahi yoğun bakımda takibe alındı. Ameliyatın 3. günü rejim 1 başlandı ve servise alındı, 4. gün rejim 2'ye geçildi ve dreni çekildi, 6. gün taburcu edildi. Ana rezeksiyon materyalinin patoloji sonucunda; çekumda apendiks orifisine 1,5 cm uzaklıkta 0,5 cm'lik ülserasyon ve serozada 2,5 x 2,5 x 1,5 cm apse formasyonu gösteren inflamasyon saptandı, *citomegalovirus* (CMV) bulgusu saptanmadı. Apendiks; distal uçta yerleşmiş, 0,3 cm'lik, seroza invazyonu olmayan, ayrıca perinöral ve vasküler invazyon saptanmayan, grad 1 (WHO, 2010) nöroendokrin tümör (karsinoid) olarak raporlandı. Ameliyat sonrası 6. ayında olan hasta sorunsuz olarak takip edilmektedir.

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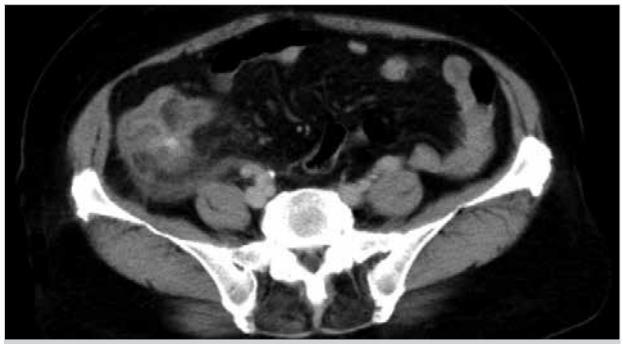
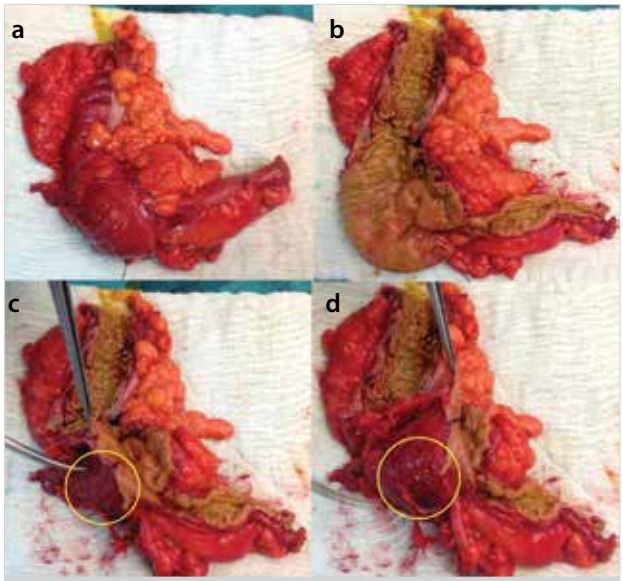
Geliş Tarihi / *Received*: 14.08.2014
Kabul Tarihi / *Accepted*: 16.11.2014
Çevrimiçi Yayın Tarihi / *Available Online Date*: 02.07.2015



Resim 1. Karın tomografisinde çekumda duvar kalınlaşması



Resim 2. a-d. Sağ hemikolektomi materyalinin görüntüsü. (a) Rezeksiyon materyali. (b) Mukozal görüntü. (c, d) Anti-mezenterik, subserozal kitle

TARTIŞMA

Benign kolonik ülserler sıklıkla çekumda görülür ve görülme sıklığı kolonoskopinin klinik kullanımının yaygınlaşmasına paralel olarak artmaktadır. Elli yaşın üzerinde ve cinsiyet ayrımı gözetmeksizin, hemodiyaliz ya da böbrek nakilli hastalarda daha sık görüldüğü bildirilmektedir (5). Etiyolojisi tam olarak bilinmemekle birlikte infeksiyon (CMV), ilaçlar (non-steroid anti-inflamatuvarlar, oral kontraseptif ilaçlar), malignite (adenokarsinom, çekal karsinoid), iskemi, çekal divertikül suçlanmaktadır (2, 6). Lezyonlar sıklıkla ileoçekal valve 2 cm uzaklıkta ve anti-mezenterik olarak yerleşir (5, 6). Olgumuzda ülser yerleşimi apendiks orifisinden 1,5 cm uzaklıkta ve anti-mezenterikti, ayrıca apendikste saptanan karsinoid tümör 0,3 cm boyutunda ve distal yerleşimliydi. Bu yüzden çekal ülser oluşumundan apendiks karsinoid tümörünün sorumlu olmadığını rastlantısal saptandığını düşünmekteyiz.

Olgumuzda olduğu gibi çoğu hastada klinik seyir, sağ alt kadran ağrısı ile akut apandisiti taklit etmektedir (2, 6, 7). Subserozal apse formasyonu ise ülserin bir komplikasyonudur ve olgumuzda olduğu gibi çekumda duvar kalınlaşması yaparak maligniteyi taklit edebilir.

Kesin tanı kolonoskopik biyopsi ya da rezeksiyon materyalinin histopatolojik incelemesinde, lenfosit, fibroblast, plazma hücreleri eozinofil gibi akut ya da kronik inflamasyonun göstergesi olan inflamatuar hücreleri içeren fibrotik nekrotik granülasyon dokusunun gösterilmesi ile konur. Mukoza ve submukozal damarlarda fibrin trombüs saptanması lokalize iskemi hipotezini destekler (2).

İdiyopatik çekal ülserlerin tedavisinde cerrahinin yeri klinik duruma göre belirlenir. Akut karın, peritonit, kontrol edilemeyen kanama, perforasyon ve malignite şüphesi durumlarında cerrahi kaçınılmazdır. Ülserin malign mi yoksa benign mi olduğunu ayırt etme zorluğu nedeniyle çoğu cerrah sağ hemikolektomi yapmaktadır. Sınırlı rezeksiyon ile frozen çalışılarak tanı konulması diğer bir seçenektir (2, 5). Olgumuzun klinik seyri akut karın şeklinde olduğu için cerrahi tedavi kaçınılmazdı ve cerrahi bulgumuz çekum duvarında ele gelen kitle lezyon olduğu için ve frozen çalışılmayacak bir zamanda olduğumuz için sağ hemikolektomi uyguladık. Akut apandisit ön tanısı ile de izlediğimiz hastamızda, ameliyatta apendiksin makroskopik olarak görünümü masumdu. Ancak rezeksiyon materyalinin patolojik incelemesi sonucunda apendiks distal uçta yerleşmiş 0,3 cm boyutunda karsinoid tümör rastlantısal olarak saptandı. Sağ hemikolektomi ile bu iki patoloji tedavi edilmiştir.

SONUÇ

Çekumda duvar kalınlığı saptanan hastalarda, idiyopatik çekal ülser ve ülsere bağlı serozal apse formasyonu gelişebileceği ve çekal maligniteyi taklit edebileceği akılda tutulmalıdır. İdiyopatik çekal ülser olgularında, apendiks karsinoid tümörü birlikte seyredebilir.

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - V.İ.; Veri toplanması ve/veya işlemesi - S.K.; Analiz ve/veya yorum - B.B.; Literatür taraması - S.K.; Yazıyı yazan - V.İ.; Eleştirel İnceleme - B.B.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Peer-review: Externally peer-reviewed.

Author Contributions: Concept - V.İ.; Data Collection and/or Processing - S.K.; Analysis and/or Interpretation - B.B.; Literature Review - S.K.; Writer - V.İ.; Critical Review - B.B.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Ulus Cerrahi Derg 2016; 32: 287-288
DOI: 10.5152/UCD.2015.2932

Incidental signet ring cell carcinoma of the gallbladder in routine histopathology

Rutin histopatolojik incelemede saptanan safra kesesinin insidental taşlı yüzük hücreli karsinomu

Ertunç Altuntaş[1], Cengiz Koçak[2], Zülfü Bayhan[3], Sezgin Zeren[3], Faik Yaylak[3]

ABSTRACT

Cholecystectomy is a common surgical procedure for various indications. Preoperative imaging is the main stay in the management of the patients. Routine and/or selective histopathological examination of the cholecystectomy materials have been discussed previously. However, incidental findings may be only observed with routine histopathological examination. Here, we report an incidental gallbladder signet cell carcinoma in a 66 years old patient. This case underlines the importance of routine histopathological examination after cholecystectomy.

Keywords: Cholecystectomy, gallbladder, signet cell carcinoma

ÖZET

Kolesistektomi en sık yapılan cerrahi girişimler arasındadır. Preoperatif görüntüleme hastaların degerlendirilmesinde en önemli köşe taşıdır. Kolesistektomi materyallerinin rutin ve/veya seçici olarak histopatolojik değerlendirilmesi daha önce tartışılan bir konudur. Ancak, insidental bulgular ancak rutin histopatolojik inceleme ile saptanabilir. Bu olgu sunumunda insidental safra kesesi taşlı yüzük hücreli karsinomu saptanan 66 yaşındaki bir hastaya ait bulgular tartışılmıştır. Bu olgu kolesistektomi sonrası rutin histopatolojik incelemenin önemini vurgulamaktadır.

Anahtar Kelimeler: Kolesistektomi, safra kesesi, taşlı yüzük hücreli karsinom

INTRODUCTION

Laparoscopic or open cholecystectomy is one of the common elective procedures in general surgery practice. Cholecystectomy may be scheduled for acute or chronic disorders of the gallbladder. Gallbladder stone disease with acute or chronic cholecystitis is the most frequent reason for cholecystectomy (1). In addition gallbladder malignancy may be a clinically controversial and challenging condition for some patients (2). Furthermore preoperative diagnosis of an incidental gallbladder malignancy may not be possible in routine preoperative evaluation.

Preoperative imaging is the important part of perioperative management for the patients with gallbladder disease. Ultrasound is used commonly for its cost effective and accepted reliability. Ultrasonography may be the single preoperative imaging technique in routine practice of emergent or elective cholecystectomy. However, for those selected patients with obstructive jaundice, pancreatitis or complicated cholecystitis further imaging techniques may be used to document biliary anatomy (3). Histopathological examination after cholecystectomy completes and confirms the diagnostic evaluations. In addition, incidental findings may be observed (4, 5).

In this paper, a case of incidental signet ring cell carcinoma of the gallbladder has been presented to underline the importance of routine histopathological examination after cholecystectomy.

CASE PRESENTATION

Sixty-six years old lady applied to our clinic with chronic right upper abdominal pain and umbilical mass. Her previous medical and surgical history was not significant. She denied a specific medical condition in her family. She was a non-smoker and a non-alcohol drinker. Physical examination revealed umbilical hernia. However, peritoneal irritation signs were absent. Elective ultrasound of the abdomen has documented gallbladder stones and no other significant finding was reported. The patient was treated with elective laparoscopic cholecystectomy and umbilical defect was repaired primarily. Postoperative course was uneventful. Histopathological examination has documented signet ring cell carcinoma of the gallbladder. The tumor was located in the body of the gallbladder. Surgical margins were intact and the tumor was graded as pT2 with perimuscular connective tissue invasion (Figure 1, 2). Antral gastritis was observed in postoperative elective upper gastrointestinal endoscopy. Endoscopic antral tissue sampling revealed normal gastric mucosa. Colonoscopy revealed no significant mucosal pathology. During further evaluation the patient has rejected the scheduled follow-up. Written informed consent was obtained from patient who participated in this case.

DISCUSSION

Routine and/or selective histopathological examination of the cholecystectomy materials have been discussed previously (4, 5). Selective histopathology has potential to lower cost per case. (6). However,

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Received / *Geliş Tarihi*: 01.10.2014
Accepted / *Kabul Tarihi*: 29.10.2014
Available Online Date / *Çevrimiçi Yayın Tarihi*: 19.06.2015

Available online at
www.ulusalcerrahidergisi.org

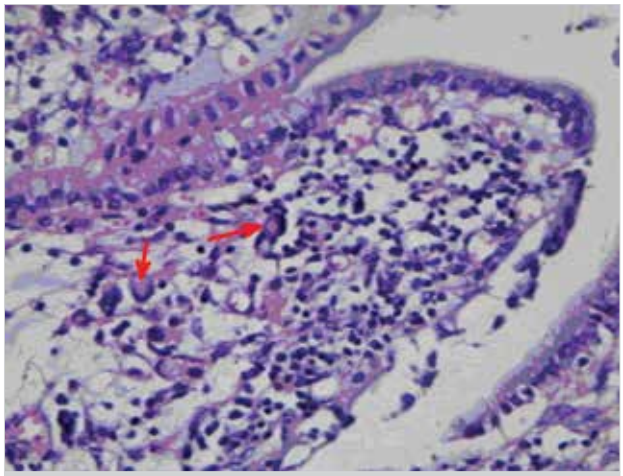

Figure 1. Gallbladder carcinoma with signet-ring cells (Hematoxylin-eosin, x40)

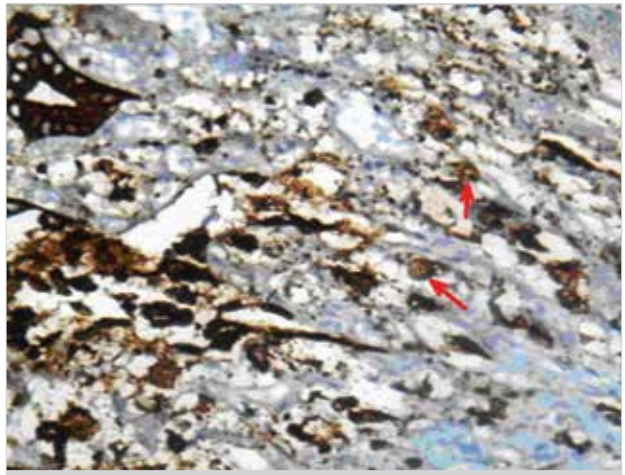

Figure 2. Gallbladder carcinoma with signet-ring cells (Pancytokeratine, x40)

routine histopathology has an advantage to document any incidental findings. In this case we observed an incidental signet cell carcinoma of the gallbladder. Primary and even metastatic signet cell carcinoma of the gallbladder has been reported previously (7, 8). Thus, histopathology report has prompted reevaluation of the patient. Breast and gastrointestinal tract screening was performed to exclude a primary tumor outside the gallbladder. Selective histopathological examination might result with a delay in the diagnosis of the cancer in this patient.

Recently the authors have discussed their observations on routine histopathological examinations after cholecystectomy for chronic cholecystitis (9). In this study they have reported that gallbladder wall thickness was not correlated with age. In addition histopathological gallbladder wall thickness was not correlated with acute inflammation in the elderly patients. However, various histopathological alterations were reported with routine histopathology. Thus it is clear that main purpose of histopathological examinations after cholecystectomy should be to confirm the clinical diagnosis and exclude incidental findings. With documentation of an incidental carcinoma, surgeon has another chance to review the management plan for the patients' favor and needs.

Signet cell carcinoma of the gallbladder is not a new clinical entity. However, this case presentation underlines the surgeon's role before and after cholecystectomy. Surgeons should be aware of the ethical and legal issues in the management of rare and incidental clinical findings. The authors recommend routine histopathologic examination. Surgeons should always review the pathology reports after cholecystectomy. In all cases the results of the histopathological examination should be discussed with the patient. In some cases further clinical evaluation may be considered.

CONCLUSION

Routine histopathology after cholecystectomy has potential to document rare clinical entities such signet cell carcinoma of the gallbladder. Signet cell carcinoma of the gallbladder may be primary or metastatic which merit further clinical investigation.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - C.K., E.A., Z.B.; Design - E.A., Z.B., S.Z.; Analysis and/or Interpretation - E.A., C.K., Z.B., S.Z., F.Y.; Literature Review - E.A., C.K., Z.B., S.Z., F.Y.; Writer - E.A., Z.B., S.Z.; Critical Review - F.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - C.K., E.A., Z.B.; Tasarım - E.A., Z.B., S.Z.; Analiz ve/veya yorum - E.A., C.K., Z.B., S.Z., F.Y.; Literatür taraması - E.A., C.K., Z.B., S.Z., F.Y.; Yazıyı yazan - E.A., Z.B., S.Z.; Eleştirel İnceleme - F.Y.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 289-291
DOI: 10.5152/UCD.2015.2884

Gastric bezoar with small bowel obstruction

İnce barsak obstrüksiyonu yapan gastrik bezoar

Ayvaz Ulaş Urgancı, Ebru Akıncılar

ABSTRACT

In the operation performed on a patient with a history of abdominal surgery, a gastric bezoar and a small bowel bezoar were detected. Adhesive bowel obstruction was suspected; however, the patient was diagnosed with mechanical intestinal obstruction. Small bowel bezoar has resulted in intestinal obstruction. This case was discussed in accordance with the literature.

Keywords: Bezoar treatment, gastric bezoar, small bowel bezoar

ÖZET

Mekanik intestinal obstrüksiyon tanısı konulan ve geçirilmiş karın ameliyatı anamnezi ile brid ileus düşünülen hastada, ameliyat sırasında; ileumda obstrüksiyona sebep olan bezoar ve gastrik bezoar saptandı. Olgu literatur bilgileri ile tartışıldı.

Anahtar Kelimeler: Bezoar tedavisi, gastrik bezoar, ince barsak bezoarı

INTRODUCTION

Bezoar is the mass of indigestible materials which accumulate in gastrointestinal system (1, 2). Although anatomic differences and motility disorders of the gastrointestinal system are predisposed, they can also be experienced in normal people. Apart from the diagnosis of conditions such as stomach ache, intraabdominal mass, anemia, malnutrition, gastric ulcer, this condition can be experienced due to complications of surgical interventions (3).

CASE PRESENTATION

Male patient was 45 years old. He came to the emergency service with abdominal pain. He was suffering from a continuous abdominal pain in the last few days and also constipation and gas in the last 2 days. He had undergone a surgical operation for the treatment of his ulcer and he has a scar in the midline. During auscultation, tenderness towards palpation and mechanical resonance was observed. He was suffering from colic pain. Leukocytes (22.000) were detected in laboratory analysis. Abdominal radiography suggested an obstruction and suspicious opacity in small intestine. In addition, angle between air and liquid had reached 90 degrees at some points. There was no air fluid level in colon. The patient's body temperature was normal and there was no air observed in abdominal radiography (Figure 1).

Performing a surgical operation was planned with the diagnosis of mechanical intestinal obstruction and the patient has given his written informed consent. In the operation, four old suture materials were detected in pylorus. Intraluminal mass that obstructed the lumen is detected to be located at 100 cm proximal from ileocecal valve. It was determined that the opacity detected in abdominal radiography had been the bezoar in the ileum. The small bowel was dilated at the proximal of the mass. There was no adhesion in the small bowel. Since it was observed in the examination that the mass was fragmented with palpation, the passage was opened without enterotomy. Fragmented bezoar parts were directed to caecum and small bowel decompressed with retrograde milking. In the operation, another mass lesion, which was 12 x 6 x 6 cm in size, was detected in fundus and it was removed (Figure 2). No complications were detected during the postoperative observation.

DISCUSSION

There are four different types of bezoars formed by undigestible materials; Phytobezoars: formed by fruit and vegetable fibroids, Trichobezoars: formed by hair, Lactobezoars: formed by milk and milk products, and Others: formed by medicines, paper, sand etc. (1).

Even though the best way to determine bezoars is endoscopic examination, other imaging methods can also be used (1, 4). Bezoars can be detected by using ultrasonography as an intraluminal mass with

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Received / *Geliş Tarihi*: 02.09.2014
Accepted / *Kabul Tarihi*: 29.10.2014
Available Online Date / *Çevrimiçi Yayın Tarihi*: 19.06.2015

Available online at
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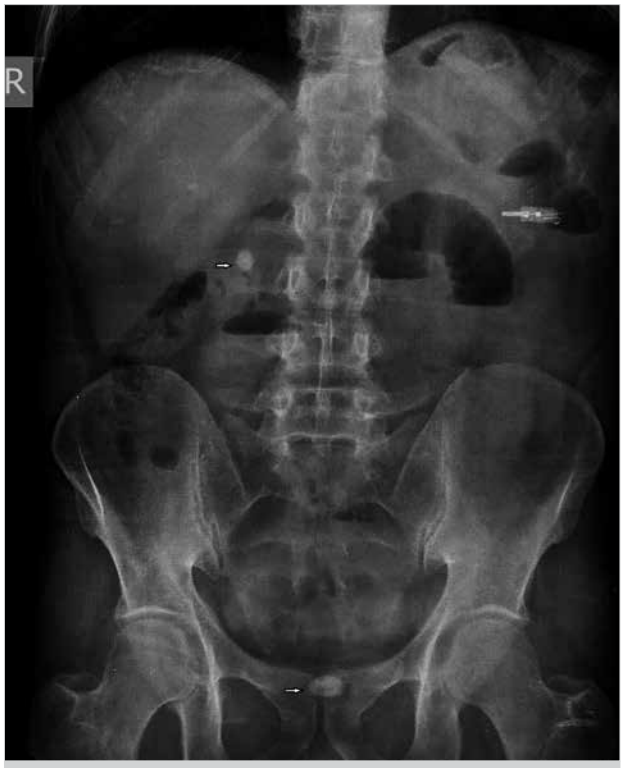

Figure 1. Abdominal radiography

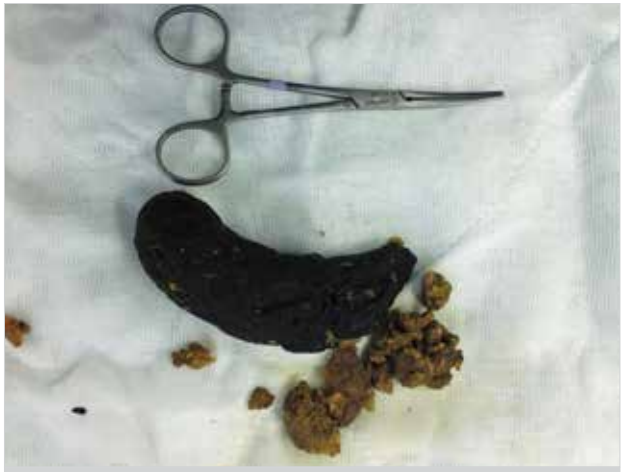
Figure 2. Gastric bezoar

acoustic shadowing (5, 6). In addition, dilatation in intestinal loops and free abdominal liquid can be detected with ultrasonography. Since small bubbles are characterized as "mottled appearance", they can be detected as an intraluminal ovoid mass in CTs. This appearance is called 'small bowel feces-sign (6, 7). CT is acknowledged as the ideal methodology to determine the intestinal obstruction as it can demonstrate the reason and the level of obstruction (7, 8).

Main predisposing factors are; history of stomach operations (especially pyloroplasty and vagotomy operations), diabetic gastroparesis, peptic ulcer, psychiatric disorders (1).

Even though there are different treatment options in the literature such as endoscopic extirpation, enzymatic fragmentation, lithotripsy, and coca cola injection, surgical operation is required especially in case of complications (1). The most common complication is intestinal obstruction. Intestinal obstruction mostly occurs in ileum and sigmoid colon where the intestinal loops are narrower (9). Bezoar can be smeared on caecum or rectum. According to the damage in the intestine, enterotomy or resection can be applied (2, 6). In addition, it must be kept in mind that there may be different bezoars in different parts of the gastrointestinal system of these patients. The percentage of patients with determination of bezoars both in stomach and intestines is 17-21% (10). Residual bezoars can cause new obstructions in 9% of patients (6).

In our case, level of leukocytes (22.000), sharpness of air-liquid level angles in abdominal radiography and distinct tympanic-sounds led us to emergency surgical operation.

There were two uniformly contoured opacities observed in direct abdominal radiography. 18% of the bezoars can be detected with abdominal radiography examinations (2). These opacities are also detected in surgical operation.

CONCLUSION

Attentive preoperative examination provides important data about the etiology of the condition. In this case, intestinal obstruction and two radiopaque masses are detected with abdominal radiography. These masses can be defined in terms of etiology as obstructive. According to our opinion, the best way to minimize morbidity and mortality during bezoar treatment is to fragment the obstruction by depressing without splitting up the lumen.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - A.U.U., E.A.; Design - A.U.U., E.A.; Supervision - A.U.U., E.A.; Funding - A.U.U.; Materials - A.U.U.; Data Collection and/or Processing - A.U.U., E.A.; Literature Review - A.U.U., E.A.; Writer - A.U.U.; Critical Review - A.U.U., E.A.; Other - A.U.U.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Yazılı hasta onamı bu çalışmaya katılan hastadan alınmıştır.

Hakem değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - A.U.U., E.A.; Tasarım - A.U.U., E.A.; Denetleme - A.U.U., E.A.; Kaynaklar - A.U.U.; Malzemeler - A.U.U.; Veri toplanması ve/veya işlemesi - A.U.U., E.A.; Literatür taraması - A.U.U., E.A.; Yazıyı yazan - A.U.U.; Eleştirel İnceleme - A.U.U., E.A.; Diğer - A.U.U.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 292-294
DOI: 10.5152/UCD.2015.2850

Laparoscopic splenectomy for a wandering spleen causing chronic pelvic pain

Kronik pelvik ağrıya neden olan gezici dalakta laparoskopik splenektomi

Ömer Yoldaş[1], Türker Karabuğa[1], İsmail Özsan[1], Erkan Şahin[2], Önder Limon[3], Ünal Aydın[1]

ABSTRACT

Wandering spleen is a rare condition with a reported incidence of less than 0.5% in which the spleen migrates from its normal anatomical location to any other position in the abdomen. Women constitute 80% of cases and one third of the overall patients are children. It has different clinical presentations such as asymptomatic, painless mass in the abdomen, intermittent abdominal pain and acute abdomen due to torsion of the vascular pedicle. Here we present a case of wandering spleen causing chronic pelvic pain. Laparoscopic splenopexy was the treatment choice but it could not be performed due to huge size of the wandering spleen.

Keywords: Laparoscopy, splenectomy, wandering

ÖZET

Gezici dalak, %0,5'in altında bildirilen insidansı ile, dalağın karın içerisinde normal anatomik pozisyonu dışında herhangi bir bölgeye göç ettiği nadir görülen bir durumdur. Olguların %80'i kadınlardan ve tüm hastaların 3'te biri çocuklardan oluşmaktadır. Asemptomatik, aralıklı karın ağrısı, ağrısız karın içi kitle veya vasküler pedikülün torsiyonuna bağlı akut karın tablosu gibi farklı kliniklerde ortaya çıkabilir. Kronik pelvik ağrıya neden olan bir gezici dalak olgusu sunuyoruz. Tercih edilen tedavi seçeneğimiz laparoskopik splenopeksi olmasına rağmen, dalağın dev boyutları nedeni ile gerçekleştirilemedi.

Anahtar Kelimeler: Laparoskopi, splenektomi, gezici

INTRODUCTION

Wandering spleen, defined as a spleen without peritoneal attachments, is a rare entity with an incidence of less than 0.5% (1, 2). It can also occur when the suspensory splenic ligaments are weakened by processes such as trauma, pregnancy and connective tissue diseases. Patients may present with a palpable mass in the abdomen or with acute, chronic, intermittent symptoms due to torsion of the wandering spleen or may be asymptomatic. Treatment of wandering spleen is surgical because conservative treatment is associated with increased complication. Splenectomy is indicated in the presence of torsion, splenic vein thrombosis or splenic infarction. Detorsion with splenopexy is the preferred choice of treatment in cases of viable wandering spleen (1, 3). We present a case of wandering spleen in a young woman with chronic pelvic pain.

CASE PRESENTATION

A 23-year-old young woman admitted to department of gynecology with a complaint of chronic pelvic pain and for a planned pregnancy. Abdominal ultrasound of the patient revealed a giant mass with a diameter of 17 cm having splenic sonographic architecture in pelvic area and the absence of the spleen in the left upper abdomen. The patient was then consulted to general surgery department. She had a history of moderate abdominal pain being sometimes severe for about two years and a mild constipation with abdominal distention. Abdominal examination revealed a palpabl, nontender mobile mass in lower abdominal quadrants. Serum hemoglobin level, white blood cell count, platelet level, liver enzyme levels and renal functions were in normal ranges. Contrast enhanced computed tomography (CT) demonstrated the extending vascular pedicle (splenic artery and vein) through the pelvic area (Figure 1, 2) and the spleen, which is 17.7 cm in its longest diameter, with a viable parenchyma isoattenuating to normal splenic tissue (Figure 3). A diagnosis of wandering spleen was made. The patient was informed about the surgical intervention. Either splenopexy or splenectomy was described and an informed written consent was obtained from the patient. The patient underwent elective laparoscopy. A three port laparoscopy was performed. Intraoperatively the spleen was in pelvis with elongating vascular pedicle in the neighbourhood of the fallopian tube, ovary and the sigmoid colon (Figure 4). Our surgical plan was to perform laparoscopic splenopexy, unfortunately due to huge size of the spleen we could not be able to perform a splenopexy to its usual position. Vascular pedicle of the spleen was ligated by using Ligasure™ device (Covidien; Colorado, USA) (Figure 5). Neither clips nor staples were used for vascular ligation. The spleen was placed in an endobag, disintegrated and aspirated through the 10 mm trocar

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Received / *Geliş Tarihi*: 06.08.2014
Accepted / *Kabul Tarihi*: 16.11.2014
Available Online Date / *Çevrimiçi Yayın Tarihi*: 19.06.2015

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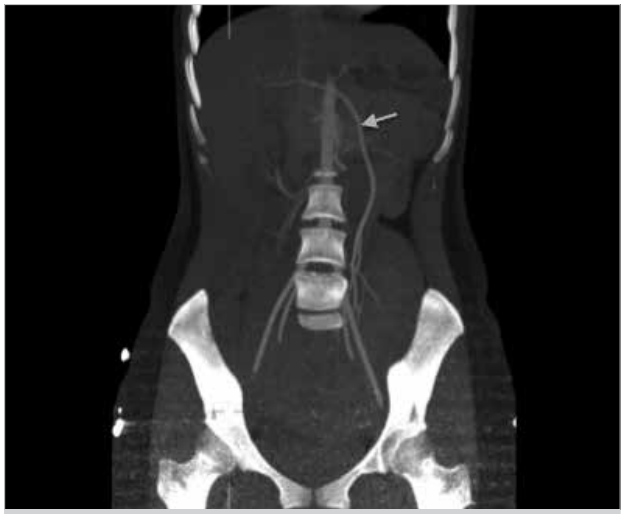

Figure 1. Visualization of extending splenic artery (white arrow) by multiplanar reconstruction (MPR) study of coronal arterial phase CT angiography

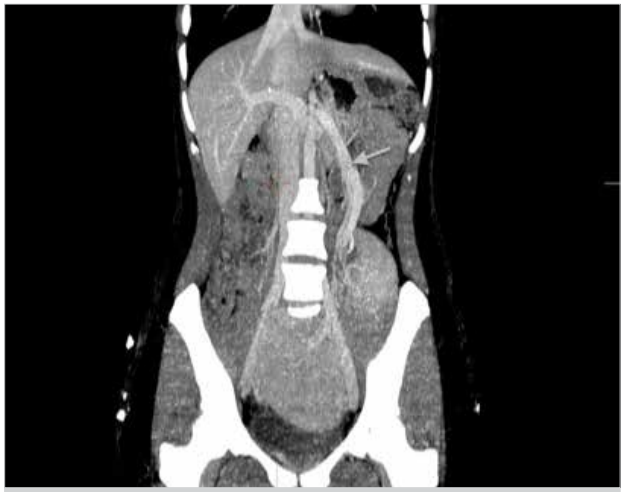

Figure 2. Visualization of the splenic vein (white arrow) by MPR study of coronal venous phase of CT angiography

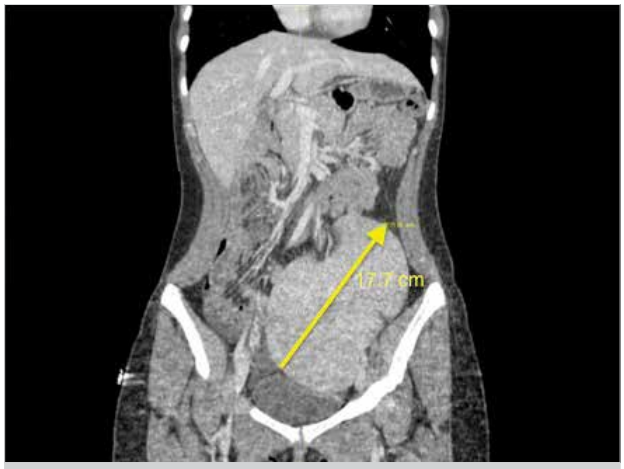

Figure 3. Coronal MPR image of huge size wandering spleen. The longest diameter of the spleen is 17.7 cm (yellow arrow)

site. A suction drain was replaced to rectovesical fossa. Postoperative period was uneventful and the patient was discharged on postoperative second day without any complication.

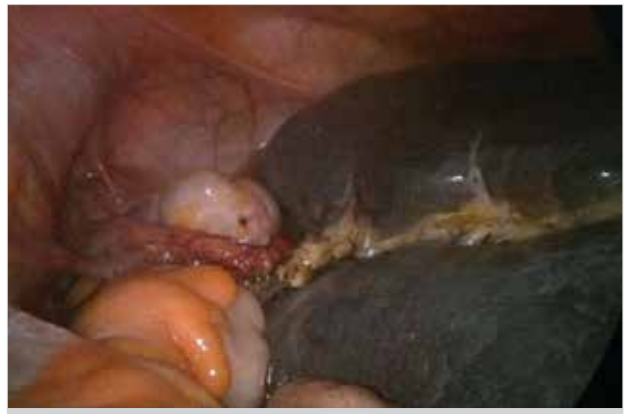

Figure 4. Intraoperative image of the wandering spleen. It was in close relation with the ovary, fallopian tube and the sigmoid colon

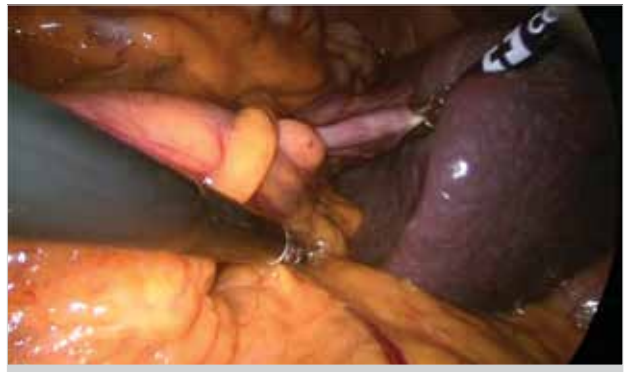

Figure 5. Ligation of the vascular pedicle of the spleen with Ligasure device

DISCUSSION

A wandering spleen occurs from a failure of fusion of the dorsal mesogastrium to the posterior abdominal wall in the second month of embryonic development. It is a rare condition with a reported incidence of less than 0.5% in which the spleen lacks retroperitoneal fixation, thus its vascular pedicle can twist resulting in ischemia. Spleen is attached to the posterior part of the left hypochondrium through the splenic pedicle which is formed by the gastrosplenic, splenorenal and splenocolic ligaments The most important one is the splenorenal ligament. Wandering spleen occurs in case of the laxity or absence of these ligaments (4). Acquired factors that increase splenic mobility include abdominal wall laxity, hormonal effects of pregnancy and splenomegaly, history of malaria, trauma, benign hematologic disease, muscular atrophy and diaphragmatic hernia repair (5, 6).

Although this condition can be diagnosed at all ages, from childhood to adolescence, and in both genders, it is most often seen in women in the third decade of life as in our case (7). Unless splenic torsion occurs and acute abdominal clinical symptomatology develops, clinical diagnosis is highly challenging due to lack of symptoms (8). The most common presentation includes subacute abdominal pain with or without other gastrointestinal complaints (9). It may also present with an acute abdomen due to splenic infarction caused by sudden torsion of the splenic pedicle (10).

Radiology plays a crucial role in the preoperative diagnosis of wandering spleen. Ultrasonography and computed tomog-

raphy (CT) show the absence of spleen in its usual position and the ectopic position of the spleen. Gray scale and Doppler ultrasonography is a feasible, effective and non-invasive method in demonstrating the localization of the spleen and blood stream and thrombi in splenic artery and vein (11). CT should be the choice of diagnosing wandering spleen in order to exclude the torsion of the spleen and demonstrate the vascular anatomy.

Although splenectomy has traditionally been used for this condition, splenopexy is increasingly used in the pediatric population to anchor the spleen and preserve splenic function. Concerns over overwhelming post-splenectomy sepsis made splenopexy first line treatment if there was no evidence of infarction or any other complicating pathology (12).

However, a recent multicenter study reported complications after splenic salvage with splenopexy in 60% of cases resulting in post splenopexy splenic ischemia (13).

CONCLUSION

Although wandering spleen is a rare condition, it should be included in the differential diagnosis of any mass lesion in the abdomen or pelvis and also of chronic or acute abdominal pain. Either splenopexy or splenectomy should be performed in appropriate conditions to avoid complications.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - İ.Ö., T.K.; Funding - Ö.L.; Writer - Ö.Y.; Critical Review - Ü.A.; Other - E.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - İ.Ö., T.K.; Kaynaklar - Ö.L.; Yazıyı yazan - Ö.Y.; Eleştirel İnceleme - Ü.A.; Diğer - E.Ş.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

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Ulus Cerrahi Derg 2016; 32: 295-297
DOI: 10.5152/UCD.2014.2686

Kolorektal kanserde Sister Mary Joseph nodülü

Sister Mary Joseph nodule in colorectal cancer

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ÖZET

Sister Mary Joseph nodülü, kanser hastalarında görülen umbilikal metastazdır. Umbilikal metastazın oluşumunda suçlanmış birkaç farklı yol olup, primer odak genellikle karında ya da pelviste yerleşmiştir. Hastalarda prognoz oldukça kötüdür. Bu çalışmamızda ileus bulguları ile başvurmuş, 44 yaşındaki kolorektal kanser tanılı erkek hastada saptanan umbilikal metastazı sunmayı amaçladık.

Anahtar Kelimeler: Kolorektal kanser, umbilikal metastaz, Sister Mary Joseph nodülü

ABSTRACT

Sister Mary Joseph nodule is the umbilical metastasis detected in cancer patients. There are various theories on the formation of umbilical metastases; however, the primary focus is often placed either in the abdomen or pelvis. Its prognosis is dismal. In this article, we aimed to present a 44-year-old male patient who presented with obstruction and was subsequently diagnosed with colorectal cancer and umbilical metastasis.

Key Words: Colorectal cancer, umbilicus metastasis, Sister Mary Joseph's nodule

GİRİŞ

Umbilikusta yerleşmiş cilt metastazı 'Sister Mary Joseph nodülü' (SMJN) olarak tanımlanır. Sister Mary Joseph Dempsey (1856-1939), 1890-1915 yılları arasında Minnesota'da St. Mary's Hastanesi'nde, William J Mayo'nun cerrahi asistanı olarak çalışmış ve 1928'de bu metastatik nodul hakkındaki ilk makaleyi yayınlamıştır (1). Primer odak sıklıkla karın içi ve pelvik organlardır fakat hematolojik malignitelerin umbilikal metastazı da nadir olarak bildirilmiştir (2). Sister Mary Joseph nodülü, kanser hastalarında kötü prognostik göstergedir ve tanı anından itibaren tedavi almayan hastalarda sağkalım 2 ile 11 ay arasında bildirilmiştir (3).

Bu çalışmada, yeni tanı almış tıkayıcı sigmoid kolon kanserli 44 yaşındaki erkek hastada farkedilen umbilikal metastazı sunmayı amaçladık.

OLGU SUNUMU

Evsiz ve özbakımı kötü olan 44 yaşında erkek hasta, acil polikliniğimize karında şişkinlik ve dışkılamada zorluk şikayetleri ile başvurdu. Yapılan fizik muayenesinde umbilikusta ülseröz ve karın duvarına fikse nodül, karında distansiyon, barsak seslerinde azalma saptandı (Resim 1). Rektal tuşesinde gayta bulaşı mevcuttu. Akut faz reaktanları normal sınırlarda idi ve ayakta direkt batın grafisinde (ADBG) kolonik hava-sıvı seviyeleri izlendi. Anamnezinde birkaç aydır olan dışkılamada zorluk şikayeti ile başka bir hastanede bir hafta önce yapılan kolonoskopisinde rektosigmoid bileşkede lümeni tama yakın tıkayan tümöral kitle saptanmış ve endoskopik biyopsi sonucu adenokarsinom olarak sonuçlanmıştı. Hasta kolorektal kansere bağlı subileus tanısı ile yatırıldı. Toraks ve batın bilgisayarlı tomografisinde karın içi yaygın asit, karaciğer ve dalakta multiple metastaz ile uyumlu nodüler lezyonlar, omentumda geniş implant alanları, peritonda kalınlaşma, çıkan ve transvers kolonda hafif dilatasyon ve rektosigmoid bileşkede lümeni dolduran tümöral kitle ile uyumlu görünüm izlendi (Resim 2). Tümör belirteçleri CA 19-9 1200 U/mL (0-37) ve CEA 11,3 ng/mL (0-5) olarak saptandı. Klinik takibinin 3. gününde lökositoz ve karın distansiyonunda artış olan ve ADBG'de hava sıvı seviyeleri belirginleşen hasta palyatif tedavi amacıyla ameliyata alındı. Sol subkostal bölgeye yapılan 5 cm'lik transvers kesi ile transvers loop kolostomi açıldı ve umbilikustaki nodülden insizyonel biopsi alındı. İncelenen biyopsi kesitlerinde yüzeyde epidermisin yer yer hiperplastik ve incelmiş olduğu görüldü. Bir alanda epidermisi infiltre eden, çoğu alanda ise dermal yerleşimli tümöral infiltrasyon izlendi. Tümör düzensiz tübüler yapılar ya da kribriform patern oluşturan, eozinofilik sitoplazmalı, iri yuvarlak çekirdekli, koyu kromatinli, arada mitozların izlendiği atipik epitelyal hücrelerden oluşmaktaydı (Resim 3). Yapılan immünohistokimyasal boyamada pankeratin ve sitokeratin 7 ile sitoplazmik boyanmış olup sitokeratin 20 ve S100 ile boyanma görülmedi (Resim 4).

Ameliyat sonrası dönemde masif malign asit nedeni ile kolostomisi aralıklı olarak çalıştı fakat ileus bulguları gerilemedi. Gün aşırı yapılan asit parasentezine rağmen asit distansiyonu geriletilemedi. Ameliyat sonrası birinci haftasında fekaloid kusmaları başlayan hastaya nazogastrik dekompresyon uygulandı.

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Geliş Tarihi / *Received*: 11.02.2014
Kabul Tarihi / *Accepted*: 15.05.2014
Çevrimiçi Yayın Tarihi/ *Available Online Date:* 25.12.2014

Nazogastrik dekompresyon ve asit parasentezlerine rağmen ileusu düzeltilemeyen hastaya laparotomi kararı alındı. Yapılan laparotomide yaygın peritoneal karsinomatozis bulguları, tüm ince barsak ve kolon anslarında kanseröz implantlara bağlı segmenter darlıklar izlendi. Karsinomatozis nedeni ile yapılan kısıtlı eksplorasyondan sonra uygun olan jejunal bir ans sol alt kadrandan karına loop ileostomi şeklinde ağızlaştırıldı fakat bu ameliyatın 3. gününde hasta kaybedildi.

TARTIŞMA

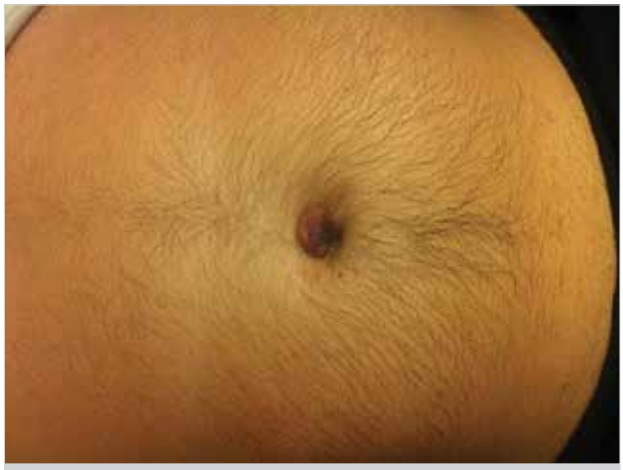
Umbilikusta görülen cilt metastazı 'Sister Mary Joseph nodülü' olarak adlandırılır (1). Kolorektal kanserlerde tanı anında çok nadir olarak görülen SMJN'nün, literatürde genellikle gastrointestinal ve jinekolojik malignitelerden kaynaklandığı bildirilmiştir. Kolon kanserinde görülen umbilikal metastaz ilk olarak 1846'da yayınlanan Walshe'in makalesinde tarif edilmiştir (4). Sıklıkla mide, kolon, over, pankreas ve daha nadiren uterus, serviks, safra kesesi ve ince barsak kökenli tümörlerden SMJN'nün oluştuğu bazı vaka serileri yayınlanmıştır (5, 6). Shetty (7), 1830 ve 1989 yılları arasında 265 umbilikal metastazlı vakayı incelediği derlemede 17 hastada primer odağın kolon kanseri olduğunu saptamışlardır. Galvan ve ark. (8), SMJN'nün özelliklerini tanımladıkları 407 vakalık seride, umbilikal metastazın %14,6'sının kolorektal kanserlerden kaynaklandığını belirtmişlerdir. Tanı anında sistemik kanser yayılımı olan bu hastalarda, bizim vakamızda olduğu gibi, SMJN kötü prognozun göstergesidir (9). SMJN görüldükten itibaren tedavi almayan hastalarda sağkalım 2 ile 11 ay arasında bildirilmiştir (3). Umbilikal cilt metastazının altında direkt peritoneal invazyon, lenfojen ve hematojen yollar gibi birkaç farklı hipotez yatmaktadır. Bu metastatik lezyonlar umbilikusa lenfatik kanallar, embriyonik venöz ya da arteryal damar ağı, lokal invazyon ya da iyatrojenik port yeri ekimi yoluyla oluşabilirler (10).

Karaciğer metastazı ve umbilikal metastaz birlikteliği değerlendirildiğinde, gastrointestinal sistem kanserlerinde portal sistem taşıyıcılığıyla oluşan karaciğer metastazlarının falsiform ligamentteki remnant umbilikal venler aracılığıyla SMJN oluşturduğu hipotezi mevcuttur. Bizim hastamızda karaciğer ve umbilikal cilt metastazı birlikte görüldü fakat literatürde bu hipotezin dışlandığı karaciğer metastazı olmayan SMJN vakası bildirilmiştir (5).

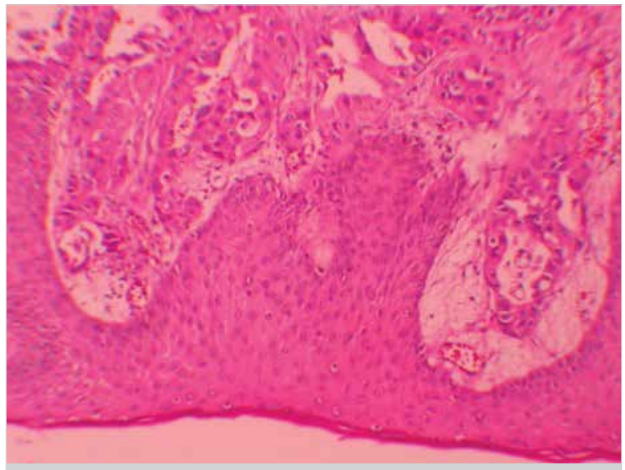
Hayat kalitesi kötü ve yaşam beklentisi az olan bu hasta grubunda cerrahi tedavi halen tartışmalıdır. Hori ve ark. (11), yayınladığı olgu sunumunda umbilikal cilt metastazının lokal rezeksiyonu yapılıp tek kesiden laparoskopik cerrahi tekniği ile sağ hemikolektomi uygulamışlardır fakat hasta erken dönemde sistemik hastalıktan kaybedilmiştir. Konservatif ve destek tedaviler birçok çalışmada önerilmiştir. Son yıllarda ileri evre kolon kanseri için kemoterapinin ve hedeflenmiş tedavinin, hayat kalitesi ve yaşam beklentisini anlamlı olarak uzattığı gösterilmiştir (12). Ameliyat seçeneklerinin yetersiz kaldığı ve kemoterapinin avantajlı olduğu bu hastalarda, perforasyon, tıkanıklık ve kanama haricinde cerrahi tedavi önerilmemesi daha uygundur.

SONUÇ

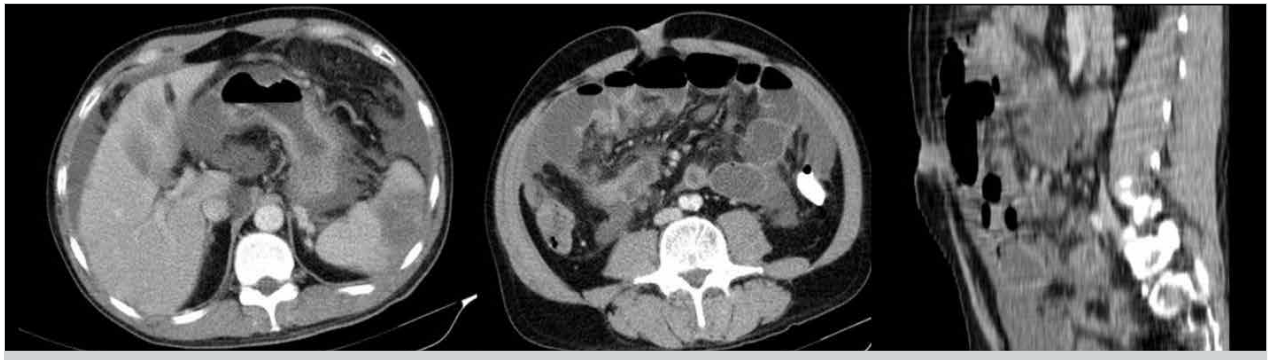
Umbilikal cilt metastazı, pelvik ve batın içi gelişen kanserlerde nadir olarak görülen bir klinik bulgudur. Tanı anında sistemik kanser yayılımı olan bu hastalarda acil cerrahi endikasyonları dışında onkoloji ve algoloji klinikleri işbirliğiyle konservatif tedaviler tercih edilmelidir.



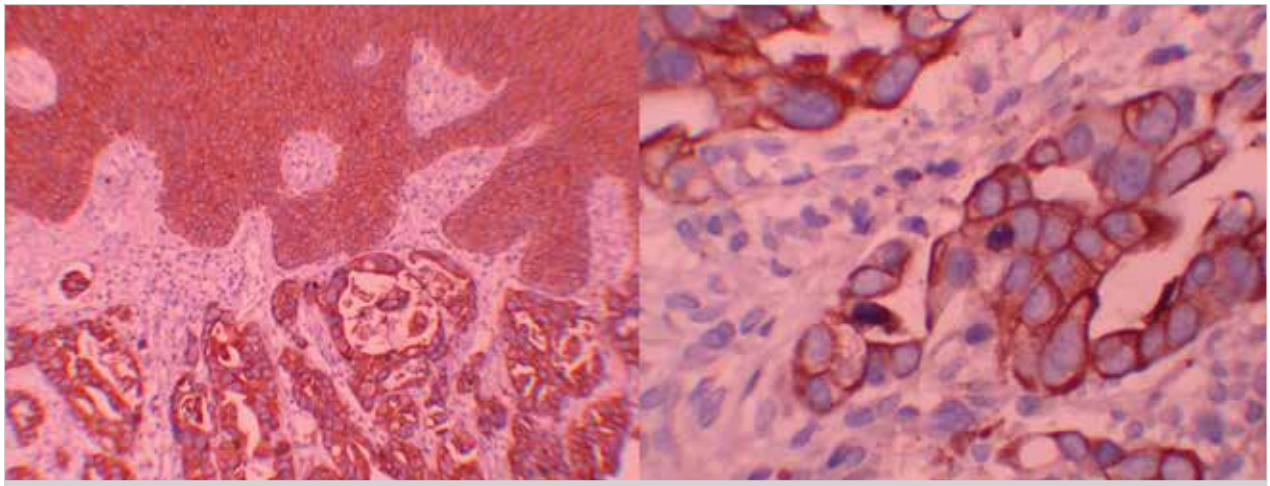
Resim 1. Umbilikusta metastatik cilt lezyonu



Resim 3. Tümöral cilt infiltrasyonunun mikroskobik görünümü



Resim 2. Karaciğer ve dalak metastazları, umbilikal tümöral nodülün bilgisayarlı tomografi görüntüleri



Resim 4. İmmünohistokimyasal tümör pozitifliği

Hasta Onamı: Hasta ameliyat sonrası dönemde kaybedildiği için bu yazıda hasta onamı alınamamıştır.

Hakem değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - Y.İ., B.K.; Tasarım - K.M.; Denetleme - K.M.; Kaynaklar - E.O.; Malzemeler - N.Ö.; Veri toplanması ve/veya işlemesi - Y.İ.; Analiz ve/veya yorum - Y.İ.; Literatür taraması - Y.İ.; Yazıyı yazan - Y.İ., S.T.; Eleştirel İnceleme - E.O.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Informed Consent: There is no patient consent form in this article because of the early postoperative death.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - Y.İ., B.K.; Design - K.M.; Supervision - K.M.; Funding - E.O.; Materials - N.Ö.; Data Collection and/or Processing - Y.İ.; Analysis and/or Interpretation - Y.İ.; Literature Review - Y.İ.; Writer - Y.İ., S.T.; Critical Review - E.O.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Ulus Cerrahi Derg 2016; 32: 298-299
DOI: 10.5152/UCD.2015.2910

Nadir bir olgu sunumu: Çift rekürren laringeal sinir

Report of a rare case: Double recurrent laryngeal nerve

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ÖZET

Tiroid ve paratiroid cerrahisinin en önemli ve en korkulan komplikasyonlarından birisi rekürren sinirin yaralanmasıdır.Bu yaralanmanın en önemli sebeplerinden biri anatomik seyrin varyasyonlar göstermesidir. Varyasyonların fazla olması nedeni ile komplikasyonları azaltmak için günümüzde sinir monitorizasyonu popüler olarak kullanılmaya başlanmıştır. Ancak ülkemizde halen maliyet sıkıntıları sebebiyle yaygın kullanılamamaktadır. Bu vakada sol tarafa lokalize çift rekürren laringeal sinir olgusunu sunacağız.

Anahtar Kelimeler: Çift, sol, rekürren sinir

ABSTRACT

One of the most important and feared complications of thyroid and parathyroid surgery is injury to the recurrent laryngeal nerve. The main reason for this type of injury is anatomical variations. Currently, nerve monitoring is being widely used to reduce complications due to the high variation rate. However, it is not being used extensively in our country, due to cost related issues. In this case, we present a left sided double recurrent laryngeal nerve.

Keywords: Double, left, recurrent nerve

GİRİŞ

Tiroid ve paratiroid cerrahisinin en önemli ve en korkulan komplikasyonlarından birisi rekürren sinirin yaralanmasıdır. Rekürren laringeal sinirler trakeanın her iki yanında bulunurlar ve larinkse girdikleri noktada Berry ligamanının hemen lateralinde yer alırlar. (1, 2). Nadiren inferior rekürren sinir non rekürren olabilir. Bu anomali sağda %0,6, solda %0,04 oranında görülür. Sinirin anatomik seyrindeki bu farklılıklar nedeni ile sinirin görülmesi ve korunması için iyi diseksiyonu şarttır (3). Bu yazıda multinodüler guatr nedeniyle total tiroidektomi ve santral boyun diseksiyonu yaptığımız bir olguda sinir eksplorasyonu sırasında rastladığımız çok nadir saptanan sol tarafa lokalize çift rekürren laringeal sinir olgusunu sunacağız.

OLGU SUNUMU

Elli sekiz yaşında kadın hasta boyunda şişlik şikayeti nedeniyle genel cerrahi polikliniğine başvurdu. On yıl öne malign melanom tanısıyla yüzün ve boynun sol tarafına radyoterapi öyküsü bulunan hastanın yapılan fizik muayenesinde tiroid sol lobda palpabl kitle saptandı. Yapılan boyun ultrasonografisinde (USG) büyüğü sol lobda dominant 23 x 20 mm çapında solid, hipoekojenik, vaskülaritesi artmış nodül olmak üzere sağ lobda da birkaç adet olan multinodüler guatr tanısı kondu. Herhangi bir lenfadenopatiye rastlanmadığı raporlandı. Tiroid fonksiyon testleri olağan idi ve özgeçmişinde herhangi bir tiroidit zemini yoktu. Sol lobdaki 23 x 20 mm'lik şüpheli nodülden iki kez alınan ince iğne aspirasyon biyopsisinde (İİAB) önemi belirsiz atipi saptanan hasta, endokrinoloji konseyinde görüşüldü. Radyoterapi öyküsü de olan ve annesinde papiller kanser öyküsü olan hastaya total tiroidektomi ve santral boyun diseksiyonu yapılması planlandı. Hastaya ameliyat anlatılıp yazılı onam alındı ve hastanın preoperatif hazırlıkları tamamlanıp ameliyata alındı. Ameliyat esnasında hem sağ lob hem de sol loba standart rekürren laringeal sinir diseksiyonu yapıldı. Öncelikle sağ lobektomi tamamlandı, ardından sol loba geçildi. Sol lobektomi yapıldı, tiroidektomi tamamlandıktan sonra sol santral boyun diseksiyonuna geçildi. Sol santral boyun diseksiyonu sırasında sol tarafta ikinci rekürren laringeal sinir görüldü. Sol kısımda lokalize çift rekürren laringeal sinir anomalisi olduğu tespit edildi (Resim 1a, b). Bilateral total tiroidektomi ve santral boyun diseksiyonu tamamlandı. Hasta postoperatif 1. gün önerilerle komplikasyon gelişmeden taburcu edildi. Patoloji sonucu papiller mikrokarsinom olarak raporlandı.

TARTIŞMA

Rekürren laringeal sinirin yaklaşık 30 adet varyasyonu olduğu bilinmektedir (2, 4). Bu varyasyonlar nedeni ile sinirin yaralanma riski ameliyat esnasında deneyimli ellerde dahi %1-2 olarak bildirilmiştir. Bu varyasyonlar nedeniyle sinirin diseksiyonunun yapılıp tam olarak görülmeden cerrahi yapılmasının güvenli bir girişim olmadığı düşünülmektedir (5). Rekürren laringeal sinir değişik dallanma şekilleri göstermektedir. Bununla ilgili birçok kadavra ve klinik çalışma mevcuttur. Rekürren laringeal sinirin 2-8 arasında dallanma gösterebileceği ve bunlarında sağ ve solda asimetrik olduğu bildirilmiştir (6). Dallanma ile ilgili yayınlarda tek ana dal: %0-65,8, iki dal %52-94, üç dal %0,8-48, dört dal %0-25, beş dal %0-10 oranları bildirilmiştir (7). Holt ve ark. (8) yaptıkları çalışmada %43 oranında iki ve üzeri dallanma olduğunu, Thompson ve ark. (9) ise %43-78 oranında larenkse girmeden önce dallanma olduğunu bildirmiştir. Kratz (6) larenkse girme öncesinde dallanma olduğunu ve bu bölgede cerrahi sırasında sıklıkla kanamalara rastlandığından yaralanmanın en çok bu bölgede olduğunu

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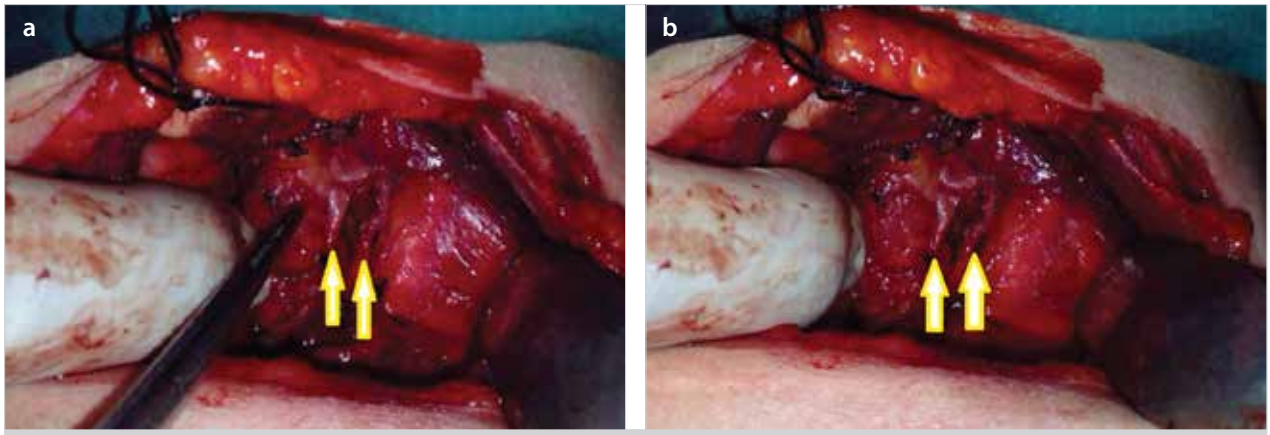
Geliş Tarihi / *Received*: 16.09.2014
Kabul Tarihi / *Accepted*: 24.11.2014
Çevrimiçi Yayın Tarihi / *Available Online Date*: 02.07.2015



Resim 1. a, b. Sol tarafa lokalize çift rekürren sinir (sinirler oklar ile gösterilmiştir)

vurgulamıştır. Nemiroff ve ark. (10) çalışmasında dallanma mesafesinin krikoid kıkırdak alt seviyesinin yaklaşık 0,6-4 cm altında olduğunu bildirmiştir. Sun ve ark. (11) yaptıkları çalışmada %100 dallanma oranı bildirmiş ve %13 oranında da rekürren laringeal sinirin halka şekli gösterdiğini vurgulamıştır. Nervus laringeus inferiorun eksplore edilmesinde sinire ulaşılabilecek en kolay nokta alt kutba yakın ve inferior tiroid arter ile yakın komşulukta seyrettiği bölgedir. Diseksiyonu daha zor olmakla beraber anatomik lokalizasyonun sabit olması nedeniyle Berry ligamanı düzeyinde de rekürren sinir gözlenebilir (12). Çok ender olarak rekürren laringeal sinir servikal bölgede vagustan ayrılır ve nonrekürren laringeal sinir adını alır. Non rekürren laringeal sinir sağda %0,5-1 oranında görülürken solda daha nadir olarak görülmektedir (2). Bu anomalilere embriyonel hayatta oluşan vasküler anomaliler de eşlik eder (1, 13).

Bizim olgumuzda çift rekürren sinir anomalisi saptandı. Santral lenf nodu diseksiyonu sırasında ikinci rekürren sinir görüldü. Bunun üzerine dal mı, yoksa ayrı bir sinir mi olduğunu değerlendirebilmek için tirotimik ligamana kadar diseksiyon yapıldı. Nervus vagusa kadar çift sinir olarak gittiği görüldü. Çift sinir olduğu anlaşıldı. Ancak bunu kanıtlayabilmek için sinir monitorizasyonuna ihtiyaç duyduk. Fakat ülkemizdeki sosyal güvenlik sigortası geri ödemelerindeki ekonomik sıkıntılar nedeni ile öncesinde İİAB ile malignite tanısı kanıtlanmamış veya nüks olmayan vakalarda sinir monitorizasyonu kullanamadığımız için bunu sadece fotoğraf çekerek gösterebildik.

SONUÇ

Birçok anomalisi olan rekürren laringeal sinir için tüm deneyimli cerrahlar tiroid ve paratiroid cerrahisi sırasında iyi bir diseksiyon yapılması ve sinirin tam ortaya konmasını önermektedir. Çok nadir de görülse çift rekürren laringeal sinir anomalisi gibi durumlarda iyi bir diseksiyon sinir yaralanması riskini en aza indirecektir. Mümkünse günümüzde popüler olmaya başlayan ve birçok merkezde sıkça kullanılan sinir monitorizasyon cihazının kullanılması da sinirin eksplorasyonunda yardımcı olup yaralanma olasılığını minimuma indirgeyecektir (14).

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - E.M.Y.; Tasarım - E.M.Y., B.M.; Denetleme - A.E., M.B.Ö.; Kaynaklar - E.M.Y., V.M.Ö.; Malzemeler - V.M.Ö.; Veri toplanması ve/veya işlemesi - V.M.Ö.; Analiz ve/veya yorum - E.M.Y.; Literatür taraması - E.M.Y., B.M.; Yazıyı yazan - E.M.Y., B.M.; Eleştirel İnceleme - A.E., M.B.Ö.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - E.M.Y.; Design - E.M.Y., B.M.; Supervision - A.E., M.B.Ö.; Funding - E.M.Y., V.M.Ö.; Materials - V.M.Ö.; Data Collection and/or Processing - V.M.Ö.; Analysis and/or Interpretation - E.M.Y.; Literature Review - E.M.Y., B.M.; Writer - E.M.Y., B.M.; Critical Review - A.E., M.B.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Ulus Cerrahi Derg 2016; 32: 300-305
DOI: 10.5152/UCD.2016.3683

Prevention and acute management of biliary injuries during laparoscopic cholecystectomy: Expert consensus statement

Laparoskopik kolesistektomi sırasında olan safra yolları yaralanmalarının önlenmesi ve erken yönetimi: Konsensus raporu

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ABSTRACT

Gallstone disease is very common and laparoscopic cholecystectomy is one of the most common surgical procedures all over the world. Parallel to the increase in the number of laparoscopic cholecystectomies, bile duct injuries also increased. The reported incidence of bile duct injuries ranges from 0.3% to 1.4%. Many of the bile duct injuries during laparoscopic cholecystectomy are not due to inexperience, but are the result of basic technical failures and misinterpretations. A working group of expert hepatopancreatobiliary surgeons, an endoscopist, and a specialist of forensic medicine study searched and analyzed the publications on safe cholecystectomy and biliary injuries complicating laparoscopic cholecystectomy under the organization of Turkish Hepatopancreatobiliary Surgery Association. After a series of e-mail communications and two conferences, the expert panel developed consensus statements for safe cholecystectomy, management of biliary injuries and medicolegal issues. The panel concluded that iatrogenic biliary injury is an overwhelming complication of laparoscopic cholecystectomy and an important issue in malpractice claims. Misidentification of the biliary system is the major cause of biliary injuries. To avoid this, the "critical view of safety" technique should be employed in all the cases. If biliary injury is identified intraoperatively, reconstruction should only be performed by experienced hepatobiliary surgeons. In the postoperative period, any deviation from the expected clinical course of recovery should alert the surgeon about the possibility of biliary injury.

Keywords: Bile duct, bile duct injury, laparoscopic cholecystectomy

ÖZ

Safra kesesi taş hastalığı çok sık görülür ve laparoskopik kolesistektomi en sık yapılan ameliyatlardandır. Laparoskopik koleistektomi sayısındaki artışa paralel olarak safra yolları yaralanmaları da artmıştır. Safra yolları yaralanma sıklığı %0,3 ile %1,4 arasında bildirilmektedir. Laparoskopik kolesistektomi sırasında olan safra yolları yaralanmalarının çoğu deneyimsizlikten değil, temel teknik hatalardan ve yanlış yorumlamalardan kaynaklanmaktadır. Türk Hepatopankreatobilier Cerrahi Derneği tarafından düzenlenen ve genel cerrahi uzmanları, bir endoskopist ve adli tıp uzmanından oluşan uzman hepatopankreatobiliyer cerrahi çalışma grubu, güvenli kolesistektomi ve laparoskopik kolesistektomi sonrası safra yolları yaralanmaları konusundaki yayınları taramış ve değerlendirmişlerdir. E-posta yolu ile grup üyelerinin görüşlerinin alınması sonrası farklı tarihlerde iki kez toplantı yapılarak, güvenli kolesistektomi, safra yolları yaralanmalarının erken yönetimi ve medikolegal konular üzerinde bir uzlaşı metini hazırlanmıştır. Çalışma grubu, safra yolları yaralanmalarının, laparoskopik kolesistektominin çok önemli bir komplikasyonu ve malpraktis davalarının önemli bir konusu olduğunu vurgulamıştır. Bu komplikasyonu önlemek için tüm ameliyatlarda mutlaka "güvenlik için kritik görüş" tekniğinin kullanılması gereklidir. Ameliyat sırasında biliyer yaralanma olduğu farkedilirse, onarım mutlaka hepatobiliyer cerrahi konusunda deneyimli bir uzman tarafından yapılmalıdır. Ameliyat sonrası dönemde ise, beklenen seyirden farklı bir klinik tablonun ortaya çıkmasının, safra yolları yaralanmasının belirtisi olabileceği akılda tutulmalıdır.

Anahtar Kelimeler: Safra yolu, safra yolu yaralanması, laparoskopik kolesistektomi

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Received / *Geliş Tarihi*: 11.08.2016
Accepted / *Kabul Tarihi*: 13.09.2016

Available online at
www.ulusalcerrahidergisi.org

INTRODUCTION

Gallstone disease is common all over the world. Gallstones are frequently seen in European and North American populations, whereas it is rare in most of the African populations. Using autopsy series findings, Brett and Parker reported that the prevalence of gallstones in European populations was 15.7% in 1976 (1). The prevalence of gallstones in sonographically based epidemiologic studies is reported to be between 3.1% and 24.5% depending on geographical location (2).

Laparoscopic cholecystectomy is the most common surgical procedure in many countries. In 2014, 96.700 cholecystectomies (84500 laparoscopic and 12 200 open) have been performed in the state hospitals of Turkey. If university and private hospitals are included, the estimated total number of cholecystectomies in 2014 rises to about 200 000. The population of Turkey is 78 million and accordingly about 0.26% of the population in Turkey undergo cholecystectomy each year (3).

Many reports have cited increased use of cholecystectomy after the popularization of laparoscopic cholecystectomy (4). Concomitantly, parallel to the increase in the number of laparoscopic cholecystectomies, bile duct injuries increased dramatically (5). It was shown that laparoscopic approach is associated with two-fold increase in the risk of bile duct injuries compared to open cholecystectomy, and addition-

ally these injuries were comparatively more severe (6). The reported incidence of bile duct injuries show variations depending on the patient population as well as the definition criterias used, and ranges from 0.3% to 1.4% (7). Many of the bile duct injuries during laparoscopic cholecystectomy are not due to inexperience, but are the result of basic technical failures and misinterpretations (8).

Bile duct injuries are severe complications which may lead to bile leaks and peritonitis, bile duct strictures, recurrent cholangitis, sepsis, secondary biliary cirrhosis, liver failure and finally may result in mortality (9). Even if adequately managed and repaired, these patients usually require life-long follow-up to recognize possible recurrences and further complications.

In this country, about 90% of the 200 000 cholecystectomies performed annually are performed laparoscopically. As an estimation, 600 to 2400 patients will suffer from bile duct injuries per year (3). Some of these injuries are minor and conservative treatment is sufficient, but many patients eventually require reconstructive surgery. Besides medical problems, these injuries also have the potential of being subject to medicolegal claims. Bile duct injuries are among the leading reasons of medicolegal claims not only in the field of general surgery, but overall.

In 2012, the European Association for Endoscopic Surgery published clinical practice guidelines on the prevention and treatment of bile duct injuries during laparoscopic cholecystectomy (10). These evidence based recommendations form the basis of contemporary clinical practice standards in terms of proper surgical technique and approach to management of biliary injury. On the other hand, circumstances may vary according to populations and geographical locations. Taking this into account and adding the issues of laparoscopic repair, approach to vascular injury, and medicolegal considerations, a study group was formed by the Turkish Association of Hepatopancreatobiliary Surgery to re-evaluate the prevention and management of biliary injuries in the early postoperative period. Consensus statements were prepared to provide recommendations for practicing surgeons.

STUDY GROUP, METHODOLOGY

The study was conducted by the Turkish Association of Hepatopancreatobiliary Surgery and prepared by a group of expert hepatopancreatobiliary surgeons, an endoscopist, and a specialist of forensic medicine. Experts were chosen according to their clinical experience and scientific standing. A brief explanatory report and a questionnaire including the principal and critical issues regarding the mechanisms, prevention and management of bile duct injuries during laparoscopic cholecystectomy were e-mailed to these experts in February 2014. Two months later, the panel joined at a consensus development meeting that was organized by the Association in Ankara. The purpose of the study, comments of the panel regarding the questions, and controversial aspects of bile duct injuries were discussed in a one-day meeting. The total number of participants was 17. A modified Delphi procedure was used for consensus development. After the first round, opinions were grouped under specified headings and sent back to the experts by e-mail. Participants ranked their agreement with each heading in the questionnaire. Agreement or disagreement was indicated on a 7-point Likert scale (1 indicates strong disagreement, 7 indicates complete agreement) (11). The rankings were then collected, analyzed, reviewed and a repeat version of the questionnaire was e-mailed to the panel for a third round. Experts had the opportunity to change their scores and re-rank their agreement according to the feedback from the group. Results were re-analyzed and re-rankings were evaluated to define consensus level.

After the third round the panel was joined in a half-day meeting in January 2016 and the consensus statements were finalized.

The strength of consensus was given in two categories. Strong consensus implies that more than 80% of the participants completely agree or agree. Weak consensus indicates that the level of agreement was between 60% to 79%.

CONSENSUS STATEMENTS

The questions and answers of the consensus meeting are discussed in detail and the following results were reached:

1. Safe Cholecystectomy

a) What are the essentials of safe laparoscopic cholecystectomy?
Technical quality of the laparoscope, instruments and operating theatre equipment is very important for safe surgery. If these equipment are not adequate, safety of the operation may be at risk. Strict adherence to principles of safe cholecystectomy prevents majority of the complications. Rationale of the "critical view of safety" is to preclude misidentification of the bile ducts. Cephalic traction of the gallbladder fundus inferiorly and laterally will decrease the redundancy of the infundibulum. Additionally, lateral retraction of the infundibulum will expose the Calot's triangle and the cystic duct and artery can be seen lying perpendicular to the common bile duct. Dissection should start close to the gallbladder infundibulum and not on the tubular structures joining the gallbladder. Peritoneum on the infundibulum is divided on both medial and lateral aspects. Lateral dissection is usually safe and facilitates medial dissection. Distal one third of the gallbladder bed should be completely lifted off the liver bed before dividing any tubular structure. No tubular structure should be clipped or cut unless completely (360-degree) encircled. There should be two and only two tubular structures joining the gallbladder. Either the cystic duct or artery can be clipped first, depending on the anatomy and ease of the procedure. Electrocautery must be used very cautiously to avoid thermal damage. If critical view of safety cannot be achieved by any reason, laparoscopic cholecystectomy should not be performed (10, 12). In this situation, further approach depends on the anatomy of the patient and the preference and experience of the surgeon. In case of unclear anatomy, conversion to open surgery is advocated. If anatomy is clear, but dissection cannot proceed mainly because of inflammation, partial (subtotal) cholecystectomy can be considered, although the safety of this approach is questionable (13). In partial laparoscopic cholecystectomy, either the cystic duct or the remnant gallbladder may be sutured and closed (14-16). Dissection can be done by scissors, dissector, hook etc. depending on the preference of the surgeon.

Statement: Critical view of safety should be obtained in all cases. If the critical view of safety cannot be achieved, either subtotal cholecystectomy or conversion to open cholecystectomy may be considered depending on the experience of the surgeon.

Consensus: Strong.

b) What is the preferred way of achieving pneumoperitoneum and entering the abdominal cavity? Veress needle method, direct trocar insertion or open entry technique?
The way of achieving pneumoperitoneum has no role in the development of biliary injuries but may be associated with bowel perforation and major vascular injuries. In one randomized study with limited number of patients, the open technique was shown to have significantly less complications compared to the blind approach (17). In patients with previous abdominopelvic surgery, especially with midline incisions, complications may be increased with the Veress needle method. In gynecologic laparoscopic surgery, the Veress needle puncture method was found to increase minor complications compared with both the open and direct trocar insertion techniques (18). Direct trocar insertion may be a safe technique in thin patients (19-21).

Statement: Current evidence in laparoscopic cholecystectomy is not sufficient to recommend a preferable way for achieving pneumoperitoneum and entering the abdominal cavity. In patients with prior abdominopelvic surgery, open entry with direct vision may decrease intestinal and vascular injuries.

Consensus: Weak.

c) Is there a difference between 30-degree and 0-degree laparoscopes on the development of biliary injuries?
A thirty-degree laparoscope may be helpful to minimize biliary injuries by increasing the exposure, but there are no clinical studies about the effect of laparoscope angle on the development of biliary complications (22-25).

Statement: Laparoscopic cholecystectomy can be safely performed with either a 30-degree or 0-degree laparoscope. Using a 30-degree laparoscope may improve exposure.

Consensus: Weak.

d) What is the role of intraoperative cholangiography in laparoscopic cholecystectomy?
Selective use of intraoperative cholangiography is recommended, rather than its routine use. Although there are controversial studies, the evidence in the literature do not support routine use of intra-operative cholangiography. Hundreds of intra-operative cholangiographies need to be performed to diagnose one bile duct injury. Intraoperative cholangiography also lengthens the operation time (26). On the other hand, performance and interpretation of intra-operative cholangiography should be taught to residents during their general surgery training (27-30).

Statement: Routine intraoperative cholangiography is not necessary in laparoscopic cholecystectomy, but should be considered under the following conditions: uncertain biliary anatomy, planned laparoscopic common bile duct exploration, suspicious or evident injury of the bile ducts. The skill and knowledge of intraoperative cholangiography should be incorporated into the curriculum of general surgery residency.

Consensus: Strong.

e) Is the risk of biliary injury increased in single-incision laparoscopic cholecystectomy?
Single-incision laparoscopic cholecystectomy is largely operator and instrument dependent, and skills of the surgeon may have an influence on the complication rates and outcome (31-33). Most of the studies report the results of experienced centers and it may not be suitable to extrapolate these findings. In these studies, postoperative pain, duration of the operation, cosmetic results and incisional hernia development were rather studied in more detail (34-36). Additionally, long term results are lacking in many reports (37-39).

Statement: Single-incision cholecystectomy does not increase the risk of biliary injury in the hands of experienced surgeons.

Consensus: Weak.

2. Biliary Injury

a) What are the risk factors for bile duct injury?
There is no consensus in clinical studies about patient-related risk factors on the development of biliary injuries. In most studies, patient age greater than 70, male sex, acute cholecystitis, bleeding during surgery, impacted stone in Hartmann's pouch, severe thickening of the gallbladder wall, cirrhosis, previous upper abdominal surgery and anatomical variations are considered as predictors of difficult laparoscopic surgery. Whether the risk of biliary injury is increased in these difficult cases is unclear. Misidentification of biliary structures is the leading cause of biliary injury and patient related factors may contribute to this error. Although the latter point is controversial, these injuries are more often seen in difficult cases (40-48). Lack of experience is a risk factor, but injuries may also occur in the hands of experienced surgeons (49, 50).

Statement: Surgeons, especially inexperienced, should be more alert for the possibility of biliary injury during laparoscopic surgery in difficult cases.

Consensus: Weak.

b) What are the symptoms and signs of biliary injury?
Most biliary injuries are diagnosed in the postoperative period and about 30% of these are diagnosed after discharge (51). Major symptoms and signs depend on the type of injury. Biliary leak presents mainly with abdominal pain, tenderness, fever and signs of sepsis. Biliary strictures usually have a more indolent course and jaundice may be the presenting symptom. Nausea and vomiting, tachycardia, weakness, anorexia are common symptoms in both type of injuries. Liver function tests, mainly cholestatic enzymes are elevated. Usually, there is delay in diagnosis. In these patients, cholangitis is the leading symptom of presentation (52, 53).

Statement: The possibility of biliary injury should be considered whenever the general condition of the patient is poor after surgery and not improving.

Consensus: Strong.

c) What is the management of biliary injuries diagnosed intra-operatively?
Whenever biliary injury is suspected intraoperatively, laparoscopic intra-operative cholangiography should be performed. If this confirms the diagnosis, immediate repair may be performed in specialist hepatobiliary centers 1 See comment in PubMed Commons below (54). Strasberg type E injuries should be treated with hepaticojejunostomy (55-59).

When the surgeon is not experienced in biliary reconstructive surgery, referral to an experienced hepatobiliary center will better serve the interest of the patient. Laparotomy should be avoided as this may further complicate the injury (60). Placing a subhepatic drain and constituting contact with the center before referral is beneficial. Any delay may worsen prognosis.

An alternative intervention is inviting an experienced surgeon for definitive on-table repair if the regulations of the center and the country permit this approach (61).

Statement: Immediate biliary reconstruction should only be attempted by experienced hepatobiliary surgeons. Otherwise, the patient should be referred to an experienced center with a subhepatic drain without attempting a laparotomy.

Consensus: Strong.

d) Can biliary injuries be repaired laparoscopically?

There are no clinical studies on the results of immediate laparoscopic repair of biliary injuries. In experienced centers, laparoscopic repair of minor leaks can be performed after obtaining an intra-operative cholangiography (62). Bile duct transection should not be repaired laparoscopically as this procedure requires advanced laparoscopic skills and fine instruments. Similarly, evidence on late repair of biliary strictures by laparoscopic hepaticojejunostomy is scarce. Long term follow-up of these patients is not known (63, 64). Laparoscopic repair of biliary strictures should only be considered in research protocols in highly specialized centers.

Statement: On-table immediate laparoscopic repair of biliary injuries is not recommended except for minor leaks from the cystic duct or liver bed. Current evidence also does not permit to advise any late laparoscopic repair.

Consensus: Strong.

e) How is right hepatic artery injury handled?

Associated right hepatic artery injury in patients with biliary injury during laparoscopic cholecystectomy is not rare. Despite this fact, a correlation between right hepatic artery injury and success of biliary reconstruction has not been demonstrated (65). Furthermore, right hepatic artery repair is a demanding procedure with low success rates (66). Liver necrosis or ischemia of the hepatic ducts occur in about 10% of the cases and may necessitate intervention (67, 68).

Right hepatic artery injury alone usually does not lead to liver necrosis because of preformed arterial hilar shunts at the level of hilar plate (69). In the presence of combined arterial and biliary injury, the possibility of biliary ischemic damage and liver necrosis is increased. The distortion of hilar plate further increases this risk (70).

In case of proper hepatic artery or portal vein injury, the patient should be referred to a hepatobiliary center emergently.

Statement: Right hepatic artery repair is usually difficult and benefit of this repair is uncertain.

Consensus: Weak.

3. Medicolegal Issues

a) What are the medicolegal perspectives of laparoscopic biliary injuries?

Laparoscopic cholecystectomy is among the leading subjects of medicolegal claims (71, 72). The first step in dealing with medicolegal issues is the indication for cholecystectomy. The indication should be objective and the patient complaints, physical examination findings and imaging studies should be clearly documented in the patient chart. If the indication of surgery is not straightforward or the documentation is doubtful, this may be a reflection of substandard care (73). The signed informed consent form should be obtained and placed in the patient's file prior to surgery. This form should include detailed information about the procedure and potential risks and complications. Before the operation, the patient should be aware of the potential to undergo major surgery.

Operative notes should be written as soon as possible after the operation, explaining the critical steps of the procedure. If injury was encountered during surgery, the extent and type of intra-operative approach should be described in detail. The patient and the family must be informed in detail following the operation. It is wise to discuss the referral of the patient to a specialized hepatobiliary unit (74). The perception of the patient and family of negligent behavior of the surgical team is usually more noteworthy than the injury itself. Delay in diagnosis or negligence of appropriate interventions should be avoided by all costs and a proactive approach should be instituted. Delay in diagnosis is usually the key issue in medicolegal claims. Injuries may occur despite employing safe cholecystectomy techniques and many of these injuries are regarded as surgical complications. On the other hand, delay in diagnosis despite warning signs and symptoms and laboratory and imaging studies, thus inappropriate management of the patients may be the subject of malpractice.

Statement: It is the surgeon's responsibility to document the indication, obtain consent, and perform a proper surgical procedure and post-operative follow-up. In the event of an inadvertent biliary injury, any delay in diagnosis and mismanagement should be avoided.

Consensus: Strong.

CONCLUSION

Iatrogenic biliary injury is a devastating complication of laparoscopic cholecystectomy and a growing issue in malpractice claims. Misidentification of the bile ducts is the leading cause of biliary injury. To avoid this, the "critical view of safety" technique should be employed with utmost care. Inexperienced surgeons should be cautious about using the single-incision technique, as this may increase the risk of biliary injury in difficult cases. If biliary injury is identified intraoperatively, reconstruction should only be undertaken by experienced hepatobiliary surgeons following an operative cholangiogram. In the postoperative period, any deviation from the expected clinical course of recovery should alert the surgeon to suspect biliary injury and take a proactive approach to diagnosis and proper management

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Ulus Cerrahi Derg 2016; 32: 306-321
DOI: 10.5152/UCD.2016.3688

Recommendations for intra-abdominal infections consensus report

İntra-abdominal infeksiyonlar için öneriler "uzlaşı raporu"

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ABSTRACT

Guidelines include the recommendations of experts from various specialties within a topic in consideration of data specific to each country. However, to date there has not been a guideline standardizing the nomenclature and offering recommendations for intra-abdominal infections (IAIs) in Turkey. This is mainly due to the paucity of laboratory studies regarding the clinical diagnosis and treatment of IAIs or the sensitivity of microorganisms isolated from patients with IAIs. However, due to the diversification of host characteristics and advancements in technological treatment methods, it has become imperative to 'speak a common language'. For this purpose May 2015, a group of 15 experts in intra-abdominal infections, under the leadership of the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey (EKMUD) and with representatives from the Turkish Surgical Association, Turkish Society of Colon and Rectal Surgery, Hernia Society, Turkish Society of Hepato-pancreato-biliary Surgery, and the Turkish Society of Hospital Infections and Control, was formed to analyze relevant studies in the literature. Ultimately, the suggestions for adults found in this consensus report were developed using available data from Turkey, referring predominantly to the 2010 guidelines for diagnosing and managing complicated IAIs in adults and children by the Infectious Diseases Society of America (IDSA) and the Surgical Infection Society. The recommendations are presented in two sections, from the initial diagnostic evaluation of patients to the treatment approach for IAI. This Consensus Report was presented at the EKMUD 2016 Congress in Antalya and was subsequently opened for suggestions on the official websites of the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey and Turkish Surgical Association for one month. The manuscript was revised according to the feedback received.

Keywords: Diagnosis, guide, intra-abdominal infection, management, recommendations

ÖZ

Rehberler, konu ile ilgili farklı uzmanlık alanlarından uzmanların her ülkenin kendi verilerini dikkate alarak hazırladıkları önerileri içerir. Ancak ülkemizde bugüne kadar intra-abdominal infeksiyonlar (İAİ) için ortak dil oluşturmak adına, önerileri kapsayan bir rehber kullanıma sunulmamıştır. Bunun en önemli nedeni klinikte İAİ'ların tanı ve tedavisi ile ilgili veya IAİ tanılı hastalardan elde edilen mikroorganizma duyarlılıklarını değerlendiren laboratuvar çalışmalarının oldukça az sayıda olmasıdır. Oysa günümüzde farklılaşan konak özellikleri ve gelişen teknolojik tedavi yöntemleri nedeniyle "ortak dil kullanmak" zorunluluk haline gelmiştir. Bu amaçla Mayıs 2015'te; Türkiye Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Uzmanlık Derneği (EKMUD)'nin önderliğinde Türk Cerrahi Derneği, Türk Kolon ve Rektum Cerrahisi Derneği, Fıtık Derneği, Türk Hepatopankreatobilier Cerrahi Derneği, Türk Hastane İnfeksiyonları ve Kontrolü Derneği üyelerinden konuya ilgi duyan toplam 15 uzman tarafından yapılan toplantılarda çalışmalar değerlendirildi. Sonuçta, erişkinler için hazırlanan bu uzlaşı raporundaki öneriler, ağırlıklı olarak Amerika İnfeksiyon Hastalıkları [Infectious Diseases Society of America (IDSA)] ve Cerrahi İnfeksiyon Derneği (Surgical Infection Society) tarafından hazırlanan erişkin ve çocuklarda komplike İAİ'ların tanısı ve yönetimi 2010 rehberi olmak üzere, ulaşılabilen rehberlerden yararlanılarak ülkemiz verileriyle hazırlandı. Öneriler; hasta ile ilk karşılaşmadan başlayarak tanısal değerlendirme ve tedavi yaklaşımı olmak üzere iki bölümde oluşturuldu. Hazırlanan uzlaşı raporu ilk kez Antalya'da EKMUD 2016 kongresinde sunuldu. Takiben bir ay süre ile derneklerin sitelerinde önerilere açıldı. Öneriler alındıktan sonra gözden geçirilerek son hali makale olarak yazıldı.

Anahtar Kelimeler: Tanı, kılavuz, intra-abdominal infeksiyon, öneri, tedavi

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INTRODUCTION

Why these guidelines were created:

Guidelines include the recommendations of experts from various specialties within a topic in consideration of data specific to each country. However, to date there has not been a guideline standardizing the nomenclature and offering recommendations for intra-abdominal infections (IAIs) in Turkey. This is mainly due to the paucity of laboratory studies regarding the clinical diagnosis and treatment of IAIs or the sensitivity of microorganisms isolated from patients with IAIs (1, 2). In some laboratory-based microorganism susceptibility studies, a portion of total isolates have been reported as organisms associated with IAI (3, 4). However, due to the diversification of host characteristics and advancements in technological treatment methods, it has become imperative to 'speak a common language'. Therefore, despite insufficient national data for preparing a guideline, this consensus report was developed in order to raise awareness of this issue and compile the available national data.

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This Consensus Report was prepared by a group of 15 experts from the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey (EKMUD), Turkish Society of Hospital Infections and Control, Turkish Surgical Association, Turkish Society of Colon and Rectal Surgery, Hernia Society, and Turkish Society of Hepato-pancreato-biliary Surgery.

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Received / *Geliş Tarihi*: 12.08.2016
Accepted / *Kabul Tarihi*: 26.09.2016

Available online at www.ulusalcerrahidergisi.org

Makale metnine www.ulusalcerrahidergisi.org web sayfasından ulaşılabilir.

The purpose of this Consensus Report:
This consensus report was prepared in order to create a standard clinical pathway for the diagnosis and treatment of patients with IAIs.

Who this Consensus Report is for:
They were designed to provide guidance to all physicians who are involved in the diagnosis and management of IAIs.

Which organizations were represented in the committee?
Under the leadership of the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey (EKMUD), the committee consisted of 15 experts in IAI from the Turkish Surgical Association, Turkish Society of Colon and Rectal Surgery, Hernia Society, Turkish Society of Hepato-pancreato-biliary Surgery, and the Turkish Society of Hospital Infections and Control.

The process of creating the guidelines/consensus report:
Preparation of the consensus report began with an initial meeting in May 2015. At this meeting, the participants primarily shared and determined the state of their issues and common practices. The participants decided to delegate the subareas amongst themselves and screen the relevant literature. Due to the particular lack of data regarding the agents of community-acquired IAI, a questionnaire was prepared to determine the reasons for not taking microbiologic samples. The questionnaire, entitled 'Questionnaire to assess surgeons' attitude and ability regarding microbiologic sampling in the diagnosis of intra-abdominal infections', was placed on the Turkish Surgical Association's website, and an e-mail notification was sent to all of the association's members. The questionnaire remained on the website for approximately six weeks, during which the members were sent several reminders via e-mail. The results of this survey were evaluated in the consensus report. The participants continued to correspond through e-mail. The consensus report was developed over the course of one year, with a total of four meetings held at the EKMUD headquarters in Ankara.

No additional patients were recruited for this report.

What databases and key words were used in the literature search?
The Ulakbim Turkish Medicine Index, Turkey Citation Index, and Turkish Medline databases were searched using the keyword terms intraabdominal/intra-abdominal infeksiyon and/or Türkiye; PubMed, EBSCOhost research databases, Proquest Health and Medical Package, Scopus and Web of Knowledge databases were searched using the keyword terms intraabdominal/intra-abdominal infection, and/or Turkey. The pages of European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) dating from 2010 to present were searched using the same keyword terms.

Table 1. Strength of recommendation and quality of evidence (5, 6)

Evaluation	Type of evidence
Strength of recommendation	
Grade A	Good evidence supporting a recommendation for use
Grade B	Moderate evidence supporting a recommendation for use
Grade C	Poor evidence supporting a recommendation
Quality of evidence	
Level I	Evidence from at least one well-designed randomized, controlled trial
Level II	Evidence from at least one non-randomized clinical trial
Level III	Evidence from opinions of respected authorities, based on clinical studies, descriptive studies, or reports from expert committees

Evaluation criteria for the evidence/conclusions reached from the available data:
There were no prospective randomized-controlled studies which primarily examined the medical and surgical treatment of IAI in Turkey. The suggestions found in this consensus report for adults were developed based on the criteria for recommendation strength and evidence quality specified in Table 1. However, all guidelines do not use the same evidence strength table. Therefore, only the evidence grades which were consistent, recommended in both of these guidelines and were also considered appropriate by our expert panel were included in this consensus report with references to the relevant guidelines. Suggestions for which an evidence grade is not specified are the consensus of the panel. Ultimately, the guidelines were developed using available data from Turkey, and referring predominantly to the 2010 guidelines for diagnosing and managing complicated IAIs in adults and children by the Infectious Diseases Society of America (IDSA) and the Surgical Infection Society (5), as well as the guidelines listed below.

- The Canadian Surgical Society and Association of Medical Microbiology and Infectious

Diseases (AMMI) 2010 practice guidelines for surgical intra-abdominal infections (6).
- The World Society of Emergency Surgery (WSES) 2103 guidelines for management of intra-abdominal infections (7).
- The French Anesthesiology and Reanimation Society [Société Française d'Anesthésie et de Réanimation (SFAR)] 2015 guidelines for management of intra-abdominal infections (8).
- The German Society for Gastroenterology, Digestive and Metabolic Diseases and German Society for General and Visceral Surgery 2014 diverticular diseases guidelines (9).
- The Italian Society of Intensive Care and International Society of Chemotherapy consensus report that can be applied in the management of intra-abdominal candidiasis in adults (10).
- IDSA 2016 revised clinical practice guideline for the management of candidiasis (11).
- American College of Gastroenterology 2013 guideline for management of acute pancreatitis (12).

The expected outcomes of publishing and disseminating this guideline/consensus report:
This consensus report was developed with the aim of making a positive contribution to the diagnostic and treatment practices of all physicians involved with IAIs. It is expected to assist physicians in various areas by guiding their approaches to diagnostic evaluation (microorganismic, host, and surgical risk factors; severity of illness; diagnostic tests), treatment (source control; fluid therapy; empiric and agent-specific antibiotic therapy and monitoring of community-acquired and healthcare-associated IAIs) and patient follow-up.

Will this guideline/consensus report be revised?
All guidelines and consensus reports are intended as guides. However, due to the inherent contextual and temporal limitations of consensus reports, they must be reviewed and updated at regular intervals. We hope that this consensus report will be periodically reviewed and improved as its weaknesses become evident with practical application and as new data become available. We envision that this process will be furthered through bringing attention to the topic and with the support of scientific associations, and especially with data obtained from randomized controlled studies conducted in Turkey.

Legal status
This is first consensus report developed in Turkey, and the recommendations herein were designed as a guide.

Structure of this guideline/consensus report
The recommendations are divided into two sections, diagnostic evaluation starting from the IAI patient's initial presentation (microorganismic, host, and surgical risk factors; severity of illness; diagnostic tests) and treatment approaches (source control; fluid therapy; empiric and agent-specific antibiotic therapy and monitoring of community-acquired and healthcare-associated IAIs).

DIAGNOSTIC EVALUATION

I. Introduction
IAIs encompass various clinical entities ranging from uncomplicated appendicitis to fecal peritonitis. Uncomplicated IAIs include intramural inflammation of the gastrointestinal tract.

Complicated IAIs describe clinical conditions in which infection has extended beyond the hollow organ into the peritoneal cavity, resulting in abscess or peritonitis. These terms are not intended to describe the severity or anatomic location of the infection. Complicated IAIs are a widespread problem and are the second most common cause of infection-related mortality in intensive care units. The incidence and mortality rates of IAIs in specific patient populations vary according to whether operative interventions were performed after trauma, etc. and the anatomic location and duration of surgical procedures performed. The reported mortality rate after appendectomy is 1.3-3.1%, with that rate increasing to over 10% in small intestine or colon surgery (6). Therefore, appropriate diagnostic evaluation should be a priority. Advances in diagnostic assessment and imaging, intensive care support, minimally invasive interventions, and antimicrobial therapy have led to substantial improvements in the accurate treatment of IAIs.

Patient history, physical examination and laboratory analyses are sufficient to identify most patients with a suspected IAI who require further treatment (IDSA, A-II) (5). For patients with compromised immunity associated with disease or therapy and selected patients with unreliable physical examination findings, such as those with altered mental state or spinal cord injury, IAI should be considered upon presentation with signs of an infection of undetermined origin (IDSA, B-III) (5).

The determination of host, microorganismic and surgical risk factors will facilitate the identification of high-risk patients.

II. Microbial risk factors
Organisms associated with IAIs in different locations and risk factors for multidrug-resistant microorganisms and specific drug-resistant microorganisms are shown in Tables 2-4 (13-16).

III. Host risk factors
Patients should be evaluated for the presence or history of malnutrition, diabetes mellitus (DM), malignancy, radiotherapy, 6-12 cycles of chemotherapy, selected chemotherapeutic agents, high American Society of Anesthesiologists (ASA) score (III-IV), high Acute Physiology and Chronic Health Evaluation II (APACHE-II) score (>15), delay in initial intervention (more than 24-48 hours), treatment failure, immunosuppression, and elevated inflammatory response (Table 5). The German guidelines for diverticular disease specify an ASA score of III-IV, DM, heart failure, chronic obstructive pulmonary disease (COPD), renal insufficiency, autoimmune vasculitis, gout, immunosuppression, hypoalbuminemia and steroid use as risk factors for increased mortality and morbidity in surgery for diverticular diseases (9). All patients should be evaluated for the presence of DM, severe cardiopulmonary disease, immunosuppression, and any of the following within the 3 months prior to presentation: 5 days or longer inpatient status and/or more than 2 days antibiotic use and/or an abdominal procedure (AMMI, A-II) (6). Patients with a history of hospitalization and/or antibiotic use and/or abdominal surgery should be considered to have healthcare-associated IAI (AMMI, A-II) (6).

Table 2. Intra-abdominal Infections and Organisms by Location (13-16)

Infection	Agent
Primary bacterial peritonitis	Gram-negative Enterobacteriaceae *Streptococcus spp.*
Secondary bacterial peritonitis	Polymicrobial infection (gram-negative Enterobacteriaceae, gram-positive *Enterococci, Staphylococci and anaerobes)*
Tertiary peritonitis	Polymicrobial infection (resistant microorganisms)
Organ	**Agent**
Gastroduodenal	*Streptococcus spp.* *Escherichia coli*
Gallbladder	*Enterococcus spp.* *E. coli* *Klebsiella* *Bacteroides spp.* *Clostridium spp.*
Small and large intestine	*E. coli* *Klebsiella spp.* *Proteus spp.* *Bacteroides spp.* *Clostridium spp.*
Appendicitis	*E. coli* *Klebsiella* *Bacteroides spp.* *Clostridium spp.*
Liver	*Enterococcus spp.* *E. coli* *Klebsiella spp.* *Bacteroides spp.*
Spleen	*Streptococcus spp.* *Staphylococcus spp.*

Table 3. Risk factors for multidrug resistant microorganisms (13-16)

High APACHE II score (≥15)
Prolonged hospitalization preoperatively
Hospital-acquired infection
Prior antibiotic use
Prolonged antibiotic use in the postoperative period
Prolonged hospitalization in the postoperative period

IV. Surgical risk factors

Risk factors associated with surgery include inadequate source control, gastrointestinal system (GIS) location, division of integrity of GIS with other systems (e.g. opening in the GIS and urogenital system or iatrogenic/inadvertent violation of a space in malignancy), use of intra-abdominal foreign bodies, repeated operative procedures, level of experience and expertise among the surgical team, and techniques used.

V. Severity of illness

Severity of illness should be evaluated with APACHE-II score. Patients with scores of 15 and over should be considered as having severe infection and those with scores under 15 as having mild to moderate infection.

Table 4. Risk factors for specific multidrug-resistant microorganisms (13-16)

Agent	Risk Factors
Vancomycin-resistant enterococcus (VRE)	• Previous antibiotic use (esp. vancomycin and 3rd generation cephalosporin) • Prolonged hospitalization • Staying in an intensive care unit • Severe underlying disease
Methicillin-resistant *Staphylococcus* aureus (MRSA)	• Presence of colonization
Extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae	• Antibiotic use (cephalosporins and quinolones) • Prolonged hospitalization • Severe underlying disease • Invasive procedures such as insertion of nasogastric tubes, gastrostomy or jejunostomy tubes and arterial catheters • Total parenteral nutrition • Recent operations • Hemodialysis • Pressure sores • Malnutrition
***Candida* species**	• Broad-spectrum antibiotic use • Central venous catheter use • Total parenteral nutrition • Renal replacement therapy in an intensive care unit • Neutropenia • Use of immunosuppressive agents (glucocorticosteroids, chemotherapeutics and immunomodulators) • Recurrent gastrointestinal perforations • Repeated surgical procedures • Anastomotic leakage • Pancreatic infections treated surgically

Sartelli et al. (17) developed a new, practical sepsis severity scoring system for patients with complicated IAIs and applied it to 4,652 patients with complicated IAI (excluding pancreatitis and primary peritonitis) 18 years of age or older who underwent surgery or invasive radiology with drainage in 132 centers in 54 countries, including 10 centers in Turkey. Of these patients, 3,966 (87.5%) had community-acquired IAI and the most common source of infection was the appendix, with 1,553 patients (34.2%). The criteria used in this scoring system are clinical findings at presentation, risk factors (age, immunosuppression), whether the IAI is healthcare-associated or community-acquired, infection localization and delayed source control (Table 6). The authors reported high sensitivity and specificity of the scoring system and determined that it could be utilized globally in the management of IAIs. According to these criteria, mortality rates were 0.63% for patients with scores of 0-3, 6.3% at scores of 4-6, and 41.7% at scores ≥7. For scores ≥13 the reported mortality rate was 80.9%.

Table 5. Approach to patients with complicated intra-abdominal infection

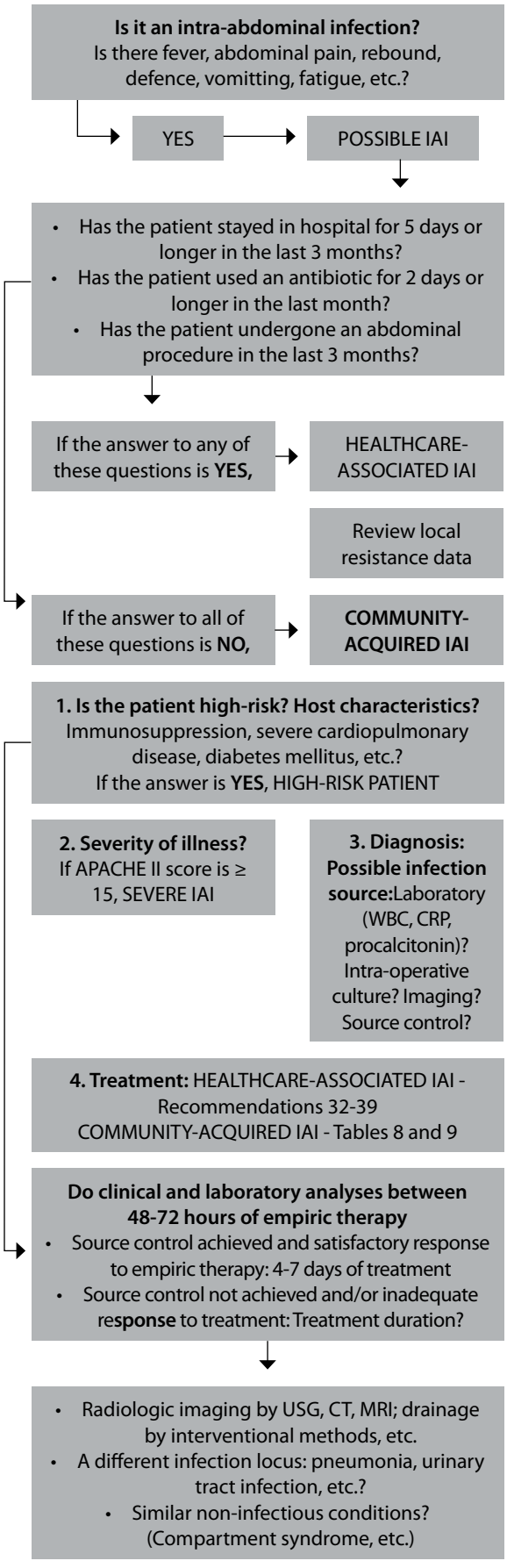

Table 6. WSES sepsis severity score for patients with complicated IAI (Score 0-18) (17)

Risk Factors	
Age (70 years and older)	2
Immunosuppression (corticosteroid, chemotherapy, etc.)	3
Clinical signs at time of presentation	
Severe sepsis (acute organ dysfunction)	3
Septic shock (requiring vasopressor therapy)	5
Healthcare-associated infection	2
Location of IAI	
Colon (non-diverticular) perforation peritonitis	2
Small intenstine perforation peritonitis	3
Diverticular diffuse peritonitis	2
Postoperative diffuse peritonitis	2
Delayed source control	
Preoperative peritonitis duration (24 hours or more)	3

VI. Diagnostic tests

Biochemical analyses: Studies evaluating the efficacy of biochemical assays like procalcitonin, C-reactive protein (CRP), and serum amyloid A in the diagnosis and follow-up of IAIs have yielded contradictory results (8, 9, 18-22). The SFAR 2015 IAI management guidelines stated that these markers may not be usable in diagnosis and that in previous studies none had value in determining the duration of antibiotic treatment. Bhangu et al. (22) reported that no single biomarker was sufficient in cases of acute appendicitis. In Turkey, Kaya et al. (23) prospectively evaluated CRP, procalcitonin and D-dimer levels in acute appendicitis patients and reported that CRP alone was not sufficient for a diagnosis, but may serve as an indicator of flegmonous appendicitis and perforated appendicitis. They also emphasized that D-dimer and procalcitonin are not superior to CRP as markers. In a prospective study by Okuş et al. (24) evaluating medical treatment and the value of CRP in the management of acute appendicitis, elevated CRP levels of 80 mg/L and over were determined to be a significant indicator of inadequate response to medical treatment. Pehlivanlı et al. (25) reported that CRP, interleukin-6, leptin, cortisol and caspase-3 did not have an effect on the decision to terminate planned abdominal repair in moderate and severe secondary peritonitis. The German diverticular diseases guidelines recommend monitoring CRP and white blood cell count in addition to clinical findings, and reported that CRP levels were associated with complications and/or perforation. Despite the above-mentioned studies investigating different aspects of IAIs, randomized controlled studies on this topic have not been conducted. Considering the conditions in Turkey and data from previous studies, it is advisable to evaluate white blood cell, CRP, procalcitonin, serum bilirubin levels, and liver and kidney function at the time of IAI diagnosis and during follow-up. These values are also necessary to be able to determine the pharmacokinetic efficacy of antibiotic regimens.

Microbiologic evaluation: The microflora of the gastrointestinal system comprises a complex ecological community including both facultative and anaerobic bacteria. The bacte-

rial composition of the normal flora varies depending on anatomic location. The fewest bacteria are found in the stomach (0-a few *Lactobacillus spp.)*, and their density increases moving from the duodenum to the ileum. Bacterial density is highest in the colon (10^9-10^{11} CFU/g). Despite the presence of bacteria in high numbers in the natural gastrointestinal ecosystem, this does not translate into greater pathogenicity or clinical significance. Although *B. fragilis* and *E. coli* comprise less than 5% of the colonic microflora, they are among the organisms most commonly isolated in IAIs. For this reason, highly virulent bacteria present in the inoculum at low densities may be overlooked in mixed cultures. Considering the phenomenon of polymicrobial suppression of virulent pathogens, the Canadian practical guidelines for surgical IAIs describe 'core' pathogens (6). These include the anaerobes *B. fragilis* and other *Bacteroides*, *Fusobacterium*, *Clostridium*, *Peptostreptococcus*, *Veillonella*, and *Lactobacillus* species, the facultative isolates *Streptococcus* species, and from the Enterobacteriaceae family *E. coli, and Klebsiella*, *Enterobacter*, *Proteus* and *Serratia* species. These pathogens should be considered first in all patients with suspected IAI, including community-acquired IAI (Table 2).

1. Routine aerobic and anaerobic cultures are considered optional in low-risk patients with community-acquired IAI. However, these cultures may be important in the detection of epidemiologic shifts in the resistance patterns of pathogens associated with community-acquired IAI and in the determination of oral treatment regimens during follow-up (B-II). In Turkey, aerobic and anaerobic cultures should be done to facilitate the detection of epidemiologic changes in the resistance patterns of IAI-associated pathogens. They may be especially important in terms of identifying quinolone/cephalosporin resistance in *E. coli* strains, monitoring metronidazole resistance in *B. fragilis*, and switching to empiric therapy and oral follow-up therapy. Cultures should be routinely taken from the infection area in healthcare-associated IAIs in high-risk patients (particularly patients more likely to carry resistant pathogens, such as elderly nursing home residents and patients with a history of frequent hospitalization, and patients who used antibiotics within the previous 1-3 months (A-II).

2. Blood cultures do not yield additional clinically significant information in patients with community-acquired IAI and are therefore not recommended routinely in these patients. However, understanding whether bacteremia is present in toxic-appearing or immunosuppressed patients is beneficial in deciding the duration of antibiotic therapy (IDSA, B-III).

3. Anaerobic cultures are not necessary in patients with community-required IAI if they are under empiric antimicrobial therapy against common anaerobic pathogens (IDSA, B-III).

4. Samples taken from the focus of the IAI should be representative of the material associated with the clinical infection (IDSA, B-III). There is no proven value of routine Gram staining of infectious material in community-acquired infections. Gram staining may be beneficial in detecting the presence of yeast in healthcare-associated infections (IDSA, C-III).

5. Cultures should be prepared from patient samples, provided they are of sufficient volume (at least 1 mL fluid or tissue, preferably more) and are conveyed to a laboratory by an appropriate transport system. For optimal yield of aerobic bacteria, 1-10 mL of fluid should be added directly to aerobic blood culture tubes. In addition, 0.5 mL of fluid should be sent to the laboratory for Gram staining and fungal cultures if indicated. If anaerobic cultures are ordered, at least 0.5 mL of fluid or 0.5 g of tissue should be conveyed in an anaerobic transport tube. Alternatively, 1-10 mL of fluid can be added directly to an anaerobic blood culture bottle in order to recover anaerobic bacteria (IDSA, A-I).

6. If a strain commonly isolated in the community (e.g. *Escherichia coli*) shows significant resistance (10-20%) to a broad-spectrum antimicrobial regimen in local use, routine cultures and sensitivity studies should be performed in cases of perforated appendicitis and community-acquired IAI (IDSA, B-III). Sensitivity tests should be performed for *Pseudomonas* sp*, Proteus* sp*, Acinetobacter* sp*, Staphylococcus aureus* and Enterobacteriaceae showing heavy growth because these varieties are more likely than others to develop resistance (IDSA, A-III).

Considering the resistance rates of organisms found in the community and commonly isolated in IAIs in Turkey, routine cultures and sensitivity studies should be performed in perforated appendicitis and community-acquired IAI. There are very few studies regarding the resistance rates of organisms associated with community-acquired IAIs in Turkey. In a study evaluating community-acquired IAIs in which intraoperative cultures were taken at 3 centers from 81 patients with no history of hospitalization or surgical interventions in the previous 3 months, the ESBL positivity rate was 9.9% for *E. coli* and 1.2% for *Klebsiella* species; resistance rates in *E. coli* were 14.5% for ceftriaxone and 22.2% for quinolone (26). A 49% rate of ESBL-positive *E. coli* was reported in healthcare-associated IAI (1). Reasons for the lack of studies on this topic in Turkey include failure to adequately raise surgeons' awareness of the importance of intraoperative sampling, surgeons not feeling the need to take cultures, insufficient technical infrastructure and organizational problems. One Turkish study reported that of 233 cases of community-acquired IAI (56 diagnosed as complicated IAI) operated by general surgeons in an emergency surgery clinic over a period of 5 months, cultures were requested in only 12 cases (5.1%). Six of these cultures yielded isolates, 3 of which were found to be ceftriaxone-resistant (27).

The consensus group prepared a questionnaire entitled 'Questionnaire to assess surgeons' attitudes and skills regarding microbiological sampling in the diagnosis of intra-abdominal infections' which was posted on the Turkish Surgical Association website and announced to all members via e-mail. The questionnaire remained on the society's website for about 6 weeks and the members were reminded several times via e-mail. A total of 136 people responded to the questionnaire.

According to the results of the questionnaire, the mean age of the respondents was 44.82±9.16 years, the mean duration of practice was 14.80±9.93 years (1-39 years), and the majority (67, 49.3%) comprised surgeons at state hospitals. Eighty-two respondents (60.3%) stated that they requested cultures. Of the 54 surgeons (39.7%) who

did not request cultures in community-acquired IAIs, 43 (79.6%) believed that culture results did not guide treatment and that taking cultures was unnecessary. However, the reported rate of culturing varied with operation type. Thirteen (9.6%) of the respondents reported collecting samples during appendectomies, 10 (7.4%) in gallbladder surgeries, 69 (50.7%) in stomach/colorectal perforation surgeries, and 129 (94.7%) in intra-abdominal abscess surgeries or invasive procedures. Among the reasons stated for not collecting samples, "laboratories of state hospitals do not accept microbiological cultures out of working hours" (p=0.012) and at private hospitals, "the guidelines do not recommend culturing in community-acquired infections" (p=0.047) were found statistically significant. These results emphasize the need for a national consensus report. Dissemination of the report to relevant physicians will provide greater consistency in the approach to patients with IAIs. Until epidemiologic data are obtained and organisms associated with IAIs are identified, cultures should also be performed at all hospitals in cases of community-acquired IAI.

VII. Imaging techniques: For patients with obvious signs of diffuse peritonitis and patients who will undergo immediate surgical intervention, the decision to conduct more advanced diagnostic imaging should be made based on the conditions of the healthcare facility and the physician's assessment. In adult patients not indicated for immediate laparotomy, computed tomography (CT) screening is the preferred imaging method for determining the source of IAI (IDSA, A-II).

MANAGING INTRA-ABDOMINAL INFECTIONS

I. SOURCE CONTROL

7. An appropriate source control procedure to immediately drain the locus of infection, control ongoing peritoneal contamination with radical resection (with or without diversion), and restore anatomic and physiologic function to the degree possible is recommended in nearly all patients with IAI (IDSA, B-II). Adequate source control is essential for managing IAIs and control cannot be achieved with antimicrobial therapy alone (IDSA, A-II). Factors leading to source control failure are shown in Table 7. These factors should be warning signs for anastomotic leakage, development of enterocutaneous fistula and/or recurrent/refractory IAI.

8. An immediate surgical procedure should be performed in cases of diffuse bacterial peritonitis (IDSA, B-II). However, with appropriate antimicrobial therapy and careful clinical monitoring, the procedure may be delayed until the patient's condition is suitable for surgery (e.g., there is no source of ongoing intraperitoneal infectious contamination such as a perforation, etc.) (IDSA, B-II). The length of this delay can vary depending on circumstances related to the patient, institution and surgeon.

9. Whenever possible, percutaneous drainage of abscesses and localized fluid collections is preferable to surgical drainage, especially in high-risk patients (IDSA, B-II). Drainage for intra-abdominal collections placed using invasive radiology is reported to be effective in 70-90% of cases (28, 29). Antimicrobial therapy without drainage may be sufficient for abscesses smaller than 3 cm in size (IDSA, B-II). However, a collection diameter less than 5 cm and the presence of biliary or intestinal fistula are significant risk factors for the failure of percutaneous drainage (8).

Table 7. Clinical factors predicting source control failure in intra-abdominal infection (5)

Delay in initial intervention (>24 hours)
High severity of illness (APACHE II score ≥15)
Advanced age
Co-morbidity and extent of organ dysfunction
Low albumin level
Poor nutritional status
Extent of peritoneal involvement diffuse peritonitis
Failure to achieve adequate debridement or drainage control
Presence of malignancy

10. Randomized controlled studies have demonstrated that in patients with acute cholecystitis, early laparoscopic cholecystectomy (within the first 72 hours) shortens hospitalization times, speeds recovery, reduces costs, and lowers open cholecystectomy rates (30, 31). Guidelines also state that endoscopic drainage of the biliary tract is safer and more effective than surgical drainage (IDSA, A-I) (5, 6). Determining the severity of acute cholecystitis is important. Patients with mild acute cholecystitis are suitable for early laparoscopic cholecystectomy. However, considering the patient's overall condition, the diagnosis should be confirmed by USG and if necessary by imaging modalities such as CT or magnetic resonance cholangiopancreatography (MRCP), and the timing of surgical interventions for patients with acute cholecystitis should be planned in light of these data (32, 33). For cases of moderate acute cholecystitis, local inflammation may make cholecystectomy difficult (33). Therefore, open cholecystectomy should not be delayed (34). Cases of severe acute cholecystitis with accompanying issues like organ failure or deterioration of overall condition can be initially treated by percutaneous cholecystostomy (33). Percutaneous cholecystostomy should be performed within the shortest time possible (<72 hours) after diagnosis of acute cholecystitis (35). After the patient comes out of critical condition following percutaneous cholecystostomy and if no postsurgical complications develop, cholecystectomy can be performed in the early period (32). The most important step in treating acute cholangitis is determining severity of illness. Treatment of acute cholangitis consists of eliminating the underlying cause with antimicrobial therapy and biliary drainage (36). The treatment for acute suppurative cholangitis is an appropriate antibiotic, fluid therapy and biliary decompression (IDSA, A-I).

11. Perforated appendicitis patients should undergo immediate surgery to achieve adequate source control (IDSA, B-III). Selected patients presenting several days after the development of inflammation with periappendiceal phlegmon (plastron) or small abscess preventing percutaneous drainage may be treated in hospital with anti-

microbial therapy under close monitoring (IDSA, B-II). Patients with well-circumscribed periappendiceal abscess can be treated with percutaneous or operative drainage when necessary. Appendectomy may be performed in these patients or the abscess may be drained. Interval appendectomy after percutaneous drainage or non-operative management of perforated appendicitis patients is controversial and may not be necessary (IDSA, A-II). Each hospital should develop a step-by-step clinical approach to standardize diagnosis, inpatient interventions, discharge, and outpatient management (IDSA, B-II). These approaches should be designed by the entire medical staff collaborating in and responsible for the care of these patients, including surgeons, infectious diseases specialists, primary care practitioners, emergency medicine physicians, radiologists, nursing providers and pharmacists. Clinical approaches should reflect local resources and standards of care (IDSA, B-II).

12. Perforated diverticulitis can be managed with laparoscopic lavage and drainage in selected patients (IDSA, C-II). In perforated diverticulitis, it is essential to differentiate patients with signs of peritonitis in physical examination from patients with evident perforation on CT but no signs of objective toxicity. The conventional treatment for perforated diverticulitis with purulent or fecal peritonitis is the Hartmann procedure (resection and proximal stoma). However, this procedure seems likely to change due to the application of current imaging techniques, antibiotic therapy, endoscopic techniques and laparoscopic lavage. Management by resectionless laparoscopic lavage is controversial. Guidelines published by international laparoscopic and surgical associations state that although colon resection is the gold standard, laparoscopic lavage may be performed in selected patients (37). The laparoscopic lavage approach is not recommended for unstable patients with obvious signs of peritonitis or patients with accompanying severe concomitant diseases.

13. In complicated acute pancreatitis, inflammation and subsequent necrosis occur within the first 2 weeks. Week 3 is the infection phase, in which clinical signs of local and systemic inflammatory syndromes emerge. It is difficult to clinically distinguish between sterile and infected pancreatic necrosis. Pancreatic abscess may develop in the late phase (week 4 and later). Acute pancreatitis with 3 consecutive days of organ failure is considered severe pancreatitis. Severe pancreatitis is frequently complicated by systemic inflammatory response syndrome (SIRS), multiple organ failure and sepsis syndrome. Determining whether pancreatic necrosis is sterile or infected is a priority. The presence of extraluminal gas on abdominal CT is pathognomonic. In the absence of this finding, a CT-guided aspiration biopsy should be obtained. Surgical interventions are usually only performed in cases of acute pancreatitis which, despite optimal treatment, exhibit progressive organ dysfunction and/or develop local complications such as infected necrosis, infected collections, abscess or fistula (12).

14. Emergency surgery should be performed in these patients unless there is hemodynamic disturbance of a severity which precludes surgical intervention. Surgical intervention should be considered for the following conditions and situations:

- Collections which are not accessible or cannot be drained percutaneously,
- Acute or diffuse peritonitis,
- Septic syndrome could not be managed by percutaneous drainage,
- When removal of the abscess wall is necessary for treatment,
- If the patient is in uncompensated septic shock,
- Drainage of acute cholangitis by two methods (biliary decompression with medical treatment and endoscopic drainage) was unsuccessful,
- When not technically possible (e.g. after distal gastrectomy), open surgical approaches should be utilized (IDSA, C-II).

15. There are three possible approaches for risky patients who are physiologically unstable and may result in source control failure: planned laparotomy, on-demand laparotomy, and standard open abdomen surgery (38). Relaparotomy, which may systematically disrupt physiology, should not be planned if surgical intervention is believed to have ensured adequate source control (8).

II. FLUID THERAPY

16. Patients with IAI should be administered intravascular fluid replacement and additional measures should be taken to ensure physiological stability. Intravenous fluid therapy should be initiated at the first suspicion of IAI, even if the patient shows no signs of reduced intravascular volume (IDSA, B-III).

17. Sepsis and septic shock is a complex process influenced by multiple factors requiring early hemodynamic support, effective source control and appropriate antibiotic use (IDSA, A-I). Fluid replacement should be initiated immediately upon the detection of hypotension in patients in septic shock (IDSA, A-II). Regardless of which system is the septic source, the general principles of sepsis and septic shock management should be followed and hemodynamic support should be provided. Achieving early and adequate source control should be the primary goal in the active treatment of abdominal sepsis (39, 40).

III. ANTIMICROBIAL REGIMENS

18. Antimicrobials and the antimicrobial combinations specified in Tables 8 and 9 are accepted as adequate for the empiric treatment of community-acquired IAI. However, antibiotics must be used at optimal dosages to minimize antimicrobial resistance, thereby guaranteeing maximum efficacy and minimal toxicity (Table 10) (IDSA, B-II) (5).

    Timing of Initiation of Antimicrobial Therapy: Antimicrobial therapy must be initiated *as soon as possible* in patients with severe sepsis/septic shock due to IAI (IDSA, A-III). For patients without signs of sepsis, antimicrobial therapy should be initiated *without delay* once a patient is diagnosed with complicated IAI or such a diagnosis is suspected.

Table 8. Agents and regimens that may be used for the initial empiric treatment of extra-biliary complicated intra-abdominal infections (5)

	Community-acquired infection in adults	
Regimen	Mild to moderate infection	Severe infection
	Perforated or abscessed appendicitis and other infections	High-risk or serious physiologic disturbance, advanced age or immunocompromised state
Single agent	Ertapenem Moxifloxacin Tigecycline	Piperacillin-tazobactam Imipenem-cilastatin Meropenem
Combination	Cefazolin Cefuroxime Ceftriaxone Cefotaxime Ciprofloxacin or Levofloxacin[a] + Metronidazole	Cefepime, Ceftazidime Ciprofloxacin or Levofloxacin[a] + Metronidazole

[a]Due to increasing resistance to fluoroquinolones in Escherichia coli, local susceptibility profiles and, if available, strain sensitivity should be investigated.

Table 9. Agents and regimens that may be used for the initial empiric treatment of biliary infections in adults (5)

Infection	Regimen
Community-acquired mild to moderate acute cholecystitis	Cefazolin, Cefuroxime or Ceftriaxone
Serious physiologic disturbance caused by community-acquired acute cholecystitis, advanced age or immunocompromised state	Imipenem-cilastatin, Meropenem, Piperacillin-tazobactam,
Acute cholangitis of any severity following bilio-enteric anastomosis	Ciprofloxacin, Levofloxacin or Cefepime
Healthcare-associated infection of any severity	+ Metronidazole

Managing community-acquired intra-abdominal infections of mild to moderate severity in adults

19. Antibiotics used in empiric therapy should be effective against enteric gram-negative aerobic and facultative bacilli and enteric gram-positive streptococci. Empiric therapy must include agents with extended spectra activity against anaerobic bacilli for infections originating in the distal small intestine, appendix and colon and perforations in the presence of obstruction or paralytic ileus (IDSA, A-I) (5).

Table 10. Initial intravenous antibiotic dosages in empiric treatment of complicated intra-abdominal infections in adults (5)

Antibiotic	Adult dosage[a]
ß-lactam/ß-lactamase inhibitor combination	
Piperacillin-tazobactam[b]	3.375 g every 6 h
Carbapenems	
Ertapenem	1 g every 24 h
Imipenem-cilastatin	500 mg every 6 h or 1 g every 8 h
Meropenem	1 g every 8 h
Cephalosporins	
Cefazolin	1-2 g every 8 h
Cefuroxime	1.5 g every 8 h
Ceftriaxone	1 g every 12 h
Cefotaxime	1-2 g every 6-8 h
Ceftazidime	2 g every 8 h
Cefepime	2 g every 8-12 h
Tigecycline	**100 mg initial dose followed by 50 mg every 12 h**
Fluoroquinolones	
Ciprofloxacin	400 mg every 12 h
Levofloxacin	750 mg every 24 h
Moxifloxacin	400 mg every 24 h
Metronidazole	**500 mg every 6-8 h or 1,500 mg every 24 h**
Aminoglicosides	
Gentamicin or tobramycin	3–7 mg/kg every 24 hours[c]
Amikacin	15–20 mg/kg every 24 hours[c]
Vancomycin	**15–20 mg/kg every 12 hours[d]**

Notes: FDA, United States Food and Drug Administration
[a]Dosages based on normal renal and hepatic function. [b]Dosage can be increased to 3.375 g every 4 h or 4.5 g every 6 h for Pseudomonas aeruginosa infection. [c]Initial dosage regimens for aminoglicosides should be adjusted according to body weight. [d]Serum-drug concentration should be considered for dosage individualization Initial dosage regimens for vancomycin should be based on total body weight.

20. For adult patients with mild to moderate IAI in Turkey, the use of ertapenem, moxifloxacin or tigecycline monotherapy or combinations of metronidazole with cefazolin, cefuroxime, ceftriaxone, cefotaxime, levofloxacin or ciprofloxacin are preferable to regimens with anti-pseudomonal activity (Tables 8 and 9) (IDSA, A-I). Because data are scarce concerning the ESBL positivity rate of organisms involved in community-acquired IAIs in Turkey, empiric antibiotics should be selected on an individual hospi-

tal basis according to the ESBL rate in local epidemiologic data (10% or higher) or the ESBL risk factors described in Table 4. Furthermore, although *Pseudomonas* species are isolated in approximately 8% of IAIs, they are less likely to be the causative agent (41).

In a Turkish study investigating carbapenem and metronidazole resistance profiles of *Bacteroides* species, 39% of the total 66 strains evaluated were of intra-abdominal origin, and none showed metronidazole resistance. However, 5 of the strains were resistant to meropenem, and one of those meropenem-resistant strains was also resistant to imipenem. The same center reported the first imipenem-resistant *B. fragilis* in 1999 and the incidence has since increased from 2% to 6%. It was also stressed that the metallobetalactamase gene was found at a much higher rate in strains of *B. fragilis* in Turkey (27%) compared to strains in other countries (2-9%) (42).

Clindamycin use is also not recommended in these patients because of the growing resistance of *B. fragilis* (IDSA, B-II). A study conducted in Turkey evaluating antibiotic susceptibility in anaerobic bacteria isolated from clinical specimens revealed the highest rate of clindamycin resistance in *Bacteroides* isolates (53%) (43).

The use of ampicillin-sulbactam is not recommended due to the high rates of resistance to this agent in community-acquired *E. coli* (IDSA, B-II). In a Turkish susceptibility study of 823 *E. coli* isolates from various patient specimens, including peritoneal fluid, only 386 (47%) of the *E. coli* isolates were sensitive to ampicillin/sulbactam. In the same study, amoxicillin/clavulanic acid susceptibility was found in 418 (51%) of the isolates (44).

Aminoglycosides are not routinely recommended for adults with IAI (IDSA, B-II). There are alternative agents which have been shown to be at least as effective and are less toxic.

Agents recommended for use in severe community-acquired or healthcare-associated infections are not recommended for community-acquired infections of mild to moderate severity because these regimens carry a higher risk of toxicity and facilitate infection with more resistant organisms (IDSA, B-II).

For mild to moderate IAIs including biliary infections, empiric antibiotic treatment against enterococci (IDSA, A-I) and empiric antifungal treatment against Candida species (IDSA, B-II) are not recommended.

21. In patients with mild to moderate IAIs including acute diverticulitis and the various forms of appendicitis who will not undergo a source control procedure, managing the infection with parenteral or early oral antibiotic therapy is recommended (IDSA, B-III). The German guidelines for diverticular diseases do not recommend antibiotic therapy for uncomplicated diverticulitis patients who do not have risk factors such as immunosuppression, and states that these patients can be monitored without inpatient treatment. Cases of complicated diverticulitis should be admitted for inpatient treatment including antibiotic therapy and surgical interventions, if necessary (9).

22. Ultrasonography is the first imaging technique for patients with suspected acute cholecystitis or cholangitis (IDSA, A-I). For patients undergoing cholecystectomy for acute cholecystitis, antimicrobial therapy should be discontinued within 24 hours unless there is evidence of infection beyond the walls of the gallbladder (B-II). Patients with suspected acute cholecystitis or cholangitis should receive the antimicrobial therapies recommended in Table 9. However, there is no indication for treatment against anaerobic organisms in the absence of biliary-enteric anastomosis (IDSA, B-II) (5, 30, 34).

23. In patients with acute pancreatitis (12):

- Cholangitis, catheter-related infections, bacteremia, urinary tract infections and extrapancreatic infections like pneumonia should be treated with antibiotics.
- Routine prophylactic antibiotic use is not recommended for patients with severe acute pancreatitis.
- Antibiotic use is not recommended to prevent sterile necrosis from developing into infected necrosis.
- Infected necrosis should be suspected in patients with pancreatic or extrapancreatic necrosis that worsens or fails to resolve despite 7-10 days of inpatient treatment. For these patients, it is recommended to (i) perform a CT-guided fine needle aspiration biopsy for Gram staining and cultures to aid the selection of an appropriate antibiotic, or (ii) use empiric antibiotic therapy without performing a fine needle aspiration biopsy.
- Interventional radiology procedures or surgical interventions may be performed once a patient is diagnosed with infected pancreatic necrosis. For patients with infected necrosis, antibiotics which can penetrate into the necrotic pancreatic tissue, such as carbapenems, quinolones and metronidazole, may be beneficial in reducing morbidity and mortality in situations where surgical intervention is deferred or delayed.
- The routine prophylactic or therapeutic use of antifungal agents is not recommended.

24. In appendicitis, although clinical signs are not sufficient for a definite diagnosis, the presence of findings such as characteristic abdominal pain, localized abdominal sensitivity, and laboratory evidence of acute inflammation will generally identify most patients with suspected appendicitis (IDSA, A-II). Patients with suspected appendicitis which could neither be confirmed nor excluded with diagnostic imaging should be closely monitored. Patients with a high index of suspicion should be monitored on an inpatient basis (IDSA, A-III). The recommended radiologic method for patients with suspected appendicitis is abdominal and pelvic CT imaging with contrast substance delivered by intravenous (not oral or rectal) route (IDSA, B-II). All patients diagnosed with appendicitis should be given antibiotic therapy (IDSA, A-II) (Table 8).

25. Operative intervention for acute non-perforated appendicitis should be performed as soon as possible, providing the procedure can be done appropriately (IDSA, B-II).

Managing high-risk community-acquired intra-abdominal infection in adults

26. The empiric use of antimicrobial regimens with broad-spectrum activity against gram-negative organisms is recommended for the treatment of patients with high-risk

IAIs as defined by an APACHE II score ≥15 or the presence of other factors listed in Table 7. These agents include meropenem, imipenem-cilastatin, piperacillin-tazobactam, and ceftazidime as single agents or combinations of metronidazole with cefepime, ciprofloxacin or levofloxacin (IDSA, A-I).

27. In high-risk patients, antimicrobial regimens should be planned according to culture and susceptibility reports in order to ensure activity against predominant pathogens isolated from the cultures (IDSA, A-III).

28. Quinolone-resistant *E. coli* have become common in some communities. Therefore, quinolones should not be used unless local *E. coli* show more than 90% susceptibility to quinolones (IDSA, A-II). In Turkey, quinolone sensitivity of *E. coli* isolates from IAI patients is reported as 54% (1), demonstrating that quinolones should not be considered as a first choice for empiric treatment.

29. The empiric use of agents effective against enterococci is recommended (IDSA, B-II). Nearly all enterococci in community-acquired infections are *E. faecalis*, which are susceptible to ampicillin, piperacillin, and glycopeptides.

30. The use of agents effective against methicillin-resistant *Staphylococcus aureus* (MRSA) and yeast are not recommended in the absence of evidence that the infection is a result of these organisms (IDSA, B-III).

31. The routine use of an aminoglycoside with a second agent effective against gram-negative facultative and aerobic bacilli is not recommended in adults in the absence of evidence that resistant organisms are involved in the infection (IDSA, A-I).

Managing healthcare-associated intra-abdominal infection in adults

32. Empiric therapy for this type of infection should be based on local microbiologic results (IDSA, A-II).

33. To achieve empiric efficacy against likely pathogens, multi-drug regimens including broad-spectrum agents with coverage against gram-negative aerobic and facultative bacilli. If local data indicate a resistance rate under 20%, infections caused by *P. aeruginosa*, *Acinetobacter* species, ESBL(+) Enterobacteriaceae and other multidrug-resistant gram-negative bacteria can be treated with combinations of metronidazole with ceftazidime or cefepime, piperacillin-tazobactam, meropenem and imipenem. Treatment choices are more limited if the resistance rate exceeds 20%. In such cases imipenem, meropenem, piperacillin-tazobaktam and aminoglicosides are used in initial treatment. Colistin combined with carbapenem or tigecycline is an alternative in the treatment of infections with strains resistant to carbapenem, quinolone and aminoglycoside. Broad-spectrum antimicrobial therapy should be planned after culture and susceptibility reports are obtained (IDSA, B-III).

    In the IDSA guideline, tigecycline is recommended for community-acquired IAIs only, whereas in the WSES 2013 guidelines for managing IAIs it is also recommended for the treatment of stabile, noncritical healthcare-associated IAI (5, 7). The Canadian 2010 AMMI guidelines also state that the pharmacokinetic and pharmacodynamic properties of tigecycline are appropriate for the treatment of healthcare-associated infections, but specify that it must be combined with ciprofloxacin for coverage of *P. aeruginosa* (6). In centers in Turkey for which *P. aeruginosa* is not among the first organisms listed in local resistance data, tigecycline treatment can be started in empiric therapy to manage mild to moderate healthcare-associated IAIs in order to limit the use of carbapenem. In a study conducted at a center in which ESBL(+) *E. coli* was the most common organism in IAIs, tigecycline monotherapy was found to yield a 72.3% cure rate in patients with malignancy and complicated IAI (2).

34. Empiric therapy covering enterococci is particularly recommended for patients with postoperative infection, patients who used other selected antimicrobial agents which may select for enterococci, such as cefalosporins, within the previous 3 months, immune-deficient patients, and patients with valvular heart disease or intravascular prosthetic materials (IDSA, B-II). Antimicrobial therapy against enterococci should be administered if enterococci are isolated from patients with healthcare-associated IAI (IDSA, B-III). Initial empiric therapy should target *Enterococcus faecalis*. Antibiotics that can potentially be used against this organism are ampicillin, piperacillin-tazobactam, teicoplanin and vancomycin. Empiric therapy against vancomycin-resistant *E. faecium* is not recommended so long as the infection with this organism does not pose a high risk (IDSA, B-III). Empiric therapy against vancomycin-resistant *E. faecium* is recommended for liver transplant recipients with IAI originating in the hepatobiliary system and patients known to be colonized with vancomycin-resistant *E. faecium* (IDSA, B-III).

35. Empiric anti-MRSA therapy should be given to IAI patients known to be colonized by this organism or those with previous treatment failure who are at risk of infection by this bacteria (IDSA, B-II). Vancomycin is the recommended treatment for suspected or proven IAI due to MRSA (IDSA, A-III).

    In Turkey, teicoplanin is also an option for treating MRSA in IAI. In the WSES 2013 IAI management guidelines, teicoplanin is recommended in combination with carbapenem for the treatment of healthcare-associated critical extra-biliary complicated IAI (7).

36. In the IDSA guidelines, antifungal therapy is recommended if *Candida* species are isolated from intra-abdominal cultures taken intraoperatively (IDSA, B-II). The Italian guidelines recommend antifungal therapy if cultures taken intraoperatively or within 24 h of external drainage produce *Candida*, but do not recommend treatment based on positive cultures taken from drains which have been in place longer than 24 h (10).

    The consensus report prepared by the Italian Society of Intensive Care and International Society of Chemotherapy states that the pathogenesis of intra-abdominal candidiasis is different and gives recommendations for the management of surgical peritonitis and abscesses in patients with-

Table 11. Specific and non-specific risk factors for intra-abdominal Candida infection (10)

Specific risk factors	Non-specific risk factors
• Surgical interventions including laparoscopy	• Acute renal failure
• Perforations including those of the upper gastrointestinal tract which are not treated within 24 hours or are recurrent	• Presence of central venous catheter
	• Feeding with parenteral nutrition
	• Severe sepsis
	• Diabetes mellitus
	• Immunosuppression
	• Prolonged broad-spectrum antibiotic use or hospitalization in intensive care
• Leakage from gastrointestinal anastomoses including the esophagus, especially gastroduodenal surgical anastomosis	

out neutropenia (10). The report highlighted the fact that intra-abdominal candidiasis in Europe was predominantly due to *C. albicans* (65-82%) and mortality ranged from 25 to 60%. The specific and nonspecific risk factors for intra-abdominal *Candida* infections identified in that report are presented in Table 11. The report recommended the use of empiric antifungal treatment for IAI patients with at least one specific risk factor (IDSA, C-III) (10, 11) and patients positive for mannan/antimannan, beta D-glucan or PCR, with or without risk factors (IDSA, B-II) (10).

In a Turkish study evaluating risk factors in liver transplant patients with candidemia, it was determined that meticulous surgical technique, starting with preparation of the patient pre-transplantation, and use of a biologic graft instead of a synthetic graft reduced the risk of candidemia. All of the patients who developed candidemia were found to have anastomotic leakage and/or reoperation/retransplantation and/or use of a vascular graft and/or presence of biliary complication. The most commonly isolated organism was *C. albicans* (45). Furthermore, *C. albicans* was reported as the most commonly isolated organism and was associated with the highest mortality in the intensive care unit of a university hospital, with 30-day crude mortality rate of 43.9% (46). In light of these data, empiric antifungal therapy must be considered, especially in cases of IAI with risk factors.

37. Fluconazole is an appropriate choice in *C. albicans* is isolated from properly obtained samples (IDSA, B-II) (5). For fluconazole-resistant *Candida* species, treatment with an echinocandin (capsofungin, micafungin or anidulafungin) is appropriate (IDSA, B-III). For critically ill patients, initial treatment with an echinocandin instead of a triazole is recommended (IDSA, B-III). Amphotericin B is not recommended as an initial treatment due to toxicity (IDSA, B-II) (5). However, in a 2016 updated clinical practice guideline for the management of candidiasis, echinocandin is recommended for initial treatment (11). In a Turkish study evaluating the use of antifungals in a general surgery department, it was reported that *C. albicans* was the organism most commonly isolated from IAI patients, fluconazole was the most used antifungal agent, and that antifungal therapy was administered more to immunosuppressed patients, regardless of culture positivity (47). In such cases, fluconazole or echinocandin should be preferred, taking into consideration patient's characteristics, risk factors, and local fluconazole resistance.

38. Prophylactic fluconazole may be considered for patients with anastomotic leakage related to a previous operation and/or recurrent gastrointestinal perforations (IDSA, B-I). Echinocandins may be used when there is high azole resistance (IDSA, C-II) (5). However, Knitsch et al. (48) conducted a randomized, placebo-controlled trial of preemptive antifungal therapy to prevent invasive candidiasis after gastrointestinal surgery at 53 centers in 17 countries (including 1 center from Turkey) and found that the preemptive use of echinocandins had no effect. Currently, antifungal prophylaxis is not routinely recommended in IAI.

39. In the repair of abdominal wall hernias, different repair techniques using various synthetic (polyester, polypropylene, polytetrafluoroethylene (PTFE), etc.) and biologic meshes are used (49). Factors reported to increase the risk of infection in these patients include cigarette use, multiple recurrence (presence of subclinical dormant microorganisms), presence of cutaneous draining sinus, the accompanying opening of any kind of stoma, open procedures, ASA > 3, poor technique, and coexisting disease (especially diabetes, malignancy, COPD or atherosclerotic heart disease). Because permanent synthetic meshes are susceptible to infection, they cannot be used in contaminated areas. Because all polyester- and polypropylene-based meshes induce severe, widespread adhesion formation, they generally should not be applied to surfaces which will directly contact the intestines unless absolutely necessary.

In cases where infection is proven, 70% of the polypropylene-based meshes and 100% of the PFTE meshes are removed. In very urgent circumstances, the contaminated or infective abdominal wall may remain as 'partially or completely open abdomen' in patients who developed acute/subacute compartment syndrome and the intra-abdominal infective pathology could not be controlled/managed at any stage (damage control approach). In such cases, an absorbent synthetic mesh should be used to temporarily close the abdominal wall and contain the organs. After repairing complex abdominal wall defects, antibiotherapy covering core organisms should be given to immunosuppressed cancer patients with prolonged chemotherapy and/or radiotherapy exposure if there are serious risk factors, in the presence of multiple predisposing factors for the development of infection, or in the presence of mesh protrusion with or without enterocutaneous/enteroatmospheric fistulization ('complicated failure'). If there is infection of the surgical site, gram-positive bacteria should also be considered, particularly *S. aureus*.

Monitoring antimicrobial therapy in patients with intra-abdominal infection

Clinical monitoring: Antimicrobial treatment of proven infection should be limited to 4-7 days, provided adequate source control is achieved. No association has been demonstrated between longer treatment durations and improved outcome (B-III). Source control is the most important step determining treatment duration. Continued antibiotic therapy is not necessary for patients whose signs and symptoms of infection have resolved (B-III). Oral therapy can be used as primary medication or step-down therapy following initial intravenous antimicrobial therapy (IDSA, B-III). During the recovery period, amoxicillin-clavulanic acid and oral quinolone (moxifloxacin, ciprofloxacin, levofloxacin) or oral cefalosporins in combination with metronidazole can be used for patients able to accept oral medications and whose infections are due to bacteria susceptible to such agents (IDSA, B-II). Because of the lack of studies on this issue in Turkey, for antibiotics with satisfactory response to parenteral administration, treatment should be completed with the most appropriate oral form.

Microbiologic monitoring: For lower-risk patients with community-acquired IAI, if source control and initial therapy result in satisfactory clinical response, no change in treatment is necessary even if follow-up cultures recover unsuspected pathogens not included in the treatment spectrum. If resistant bacteria are detected in cultures taken during the first intervention and there are persistent signs of infection, treatment against those organisms is recommended (IDSA, B-III). Organisms recovered from blood cultures should be considered significant if they are of pathogenic potential or are isolated from at least 2 blood cultures (IDSA, A-I). Patients with positive blood cultures should be treated for at least 10 days. Follow-up cultures should be taken between 48-72 h of their antibiotic therapy, regardless of level of fever, and negative blood cultures should be demonstrated.

Treatment failure: Patients with persistent or recurrent clinical signs of infection following 4-7 days of antimicrobial therapy should undergo appropriate diagnostic imaging tests (CT, MRI or USG). Antimicrobial therapy against the organisms initially identified should be continued (IDSA, A-III). However, if initial empiric antimicrobial therapy does not result in a satisfactory clinical response, investigation into extra-abdominal sources of infection (pneumonia, urinary tract infection, bloodstream infection, etc.) and non-infectious inflammatory conditions is recommended (IDSA, A-II). Furthermore, the role of intra-abdominal hypertension and abdominal compartment syndrome in source control should be evaluated. For patients who do not show initial treatment response and for whom a focus of infection remains, an aspiration or tissue sample of sufficient volume (at least 1.0 mL fluid or tissue) should be obtained, sent to the laboratory in a transport system suitable for anaerobics, and used for both aerobic and anaerobic cultures (IDSA, C-III).

In the CIAOW study (complicated intra-abdominal infections worldwide observational study) conducted in 68 medical centers (including 10 in Turkey), the average mortality rate was reported as 10.5% (15). Patient's age, small intestine perforation, delay in surgical intervention, hospitalization in intensive care and immunosuppression were identified as factors affecting mortality. A thorough evaluation of all aspects, taking into account patients' risk factors, will decrease the mortality rate.

In conclusion, all guidelines and consensus reports are intended as guides. This consensus report was also prepared to facilitate diagnosis and treatment for all physicians dealing with IAIs. Because of the lack of relevant randomized, controlled trials, insufficient microbiologic sampling and few studies conducted on this topic in Turkey, the data available in the literature were evaluated. According to these data, it is apparent that epidemiologic data for each region, and in fact each hospital, is necessary in order to develop optimal protocols for patient follow-up. The first priority for Turkey is to collect intraoperative cultures from IAI patients to determine microorganism susceptibility and record the patients' characteristics. This report, which we believe will serve to raise awareness of this issue, is the start of a multidisciplinary approach to IAIs. Due to the inherent contextual and temporal limitations of consensus reports, they must be reviewed and updated at regular intervals. We hope that this consensus report will be periodically reviewed and improved as its weaknesses become evident with practical application and as new data become available. It should never be forgotten that we physicians attempt to calculate the risks, but it is the patients who assume the total risk incurred.

In reports to follow, we hope that the multidisciplinary collaboration will continue in many other topics such as the effects of probiotic use, the influence of rifaximin use in ulcerative colitis/diverticulitis on the distribution of intra-abdominal microbes, and the effect of prolonged ciprofloxacin+metronidazole use in inflammatory bowel disease on IAI treatment.

A brief summary of the main messages

DIAGNOSTIC EVALUATION OF INTRA-ABDOMINAL INFECTIONS

- Monitoring of patients with IAIs should be multidisciplinary.
- Microorganismic, host and surgical risk factors should be evaluated separately.
- Potential infections should be identified as healthcare-associated or community-acquired. Patients with hospitalization lasting five days or longer and/or more than two days antibiotic use and/or an abdominal procedure within the three months prior to presentation should be considered healthcare-associated IAI.
- Severity of the infection should be evaluated using APACHE-II score. Multicenter studies have shown that mortality increases with higher score.
- **Biochemical tests**: Considering the conditions in Turkey and data from previous studies, it is advisable to evaluate white blood cell, CRP, procalcitonin, serum bilirubin levels, and liver and kidney function at the time of IAI diagnosis and during follow-up. These values are also necessary to be able to determine the pharmacokinetic efficacy of antibiotic regimens.
- **Microbiologic evaluation:** In Turkey, intraoperative routine aerobic and anaerobic culturing is recommended, even for low-risk community-acquired IAI patients. In Turkey, aerobic and anaerobic cultures should be done to facilitate the detection of epidemiologic changes in the resistance patterns of IAI-associated pathogens.
- **Imaging**: For patients with obvious signs of diffuse peritonitis and those who will undergo immediate surgical in-

tervention, the decision to conduct more advanced diagnostic imaging should be made based on the healthcare facility and the physician's assessment.

TREATMENT OF INTRA-ABDOMINAL INFECTIONS

- Adequate source control is essential for managing IAIs and control cannot be achieved with antimicrobial therapy alone.
- Sepsis and septic shock is a complex process influenced by multiple factors requiring early hemodynamic support, effective source control and appropriate antibiotic use. Achieving early and adequate source control should be the primary goal in the active treatment of abdominal sepsis. Antibiotherapy should be initiated as soon as possible.
- For adult patients with mild to moderate community-acquired IAI in Turkey, the use of ertapenem, moxifloxacin or tigecycline monotherapy or combinations of metronidazole with cefazolin, cefuroxime, ceftriaxone, cefotaxime, levofloxacin or ciprofloxacin are preferable to regimens with anti-pseudomonal activity. Empiric antibiotics should be selected on an individual hospital basis according to the ESBL rate in local epidemiologic data (10% or higher) or the ESBL risk factors described in this consensus report.
- Routine prophylactic antibiotic use is not recommended for patients with severe acute necrotizing pancreatitis or sterile necrosis. Infected necrosis should be suspected in patients with pancreatic or extrapancreatic necrosis that worsens or fails to resolve despite 7-10 days of inpatient treatment. For these patients, it is recommended to take a sample for culturing, if possible, and use empiric antibiotic therapy.
- For patients with high-risk community-acquired IAI or healthcare-associated IAI, the empiric use of piperacillin-tazobactam, ceftazidime, meropenem, imipenem-cilastatin as single agents or combinations of metronidazole with cefepime, ciprofloxacin or levofloxacin is recommended. In Turkey, quinolone sensitivity of *E. coli* isolates from IAI patients is reported as 54% (1), demonstrating that quinolones should not be considered as a first choice for empiric treatment.
- Antimicrobial/antifungal therapy is recommended for patients with community-acquired high-risk IAI or healthcare-associated IAI in the presence of risk factors for or evidence of infection with resistant gram-positive bacteria or candida.
- Empiric therapy for healthcare-associated IAI should be based on local microbiologic results. Broad-spectrum antibiotic therapy initiated empirically should be adjusted according to culture and sensitivity results. In centers in Turkey for which *P. aeruginosa* is not among the first organisms listed in local resistance data, tigecycline treatment can be started in empiric therapy to manage mild to moderate healthcare-associated IAIs in order to limit the use of carbapenem.
- In abdominal wall hernia repair, different repair techniques with various synthetic (polyester, polypropylene, polytetrafluoroethylene (PTFE), etc.) and biologic meshes are used. In cases where infection is proven, 70% of the polypropylene-based meshes and 100% of the PFTE meshes are removed. In the presence of multiple predisposing factors for the development of infection, or in the presence of mesh protrusion with or without enterocutaneous/enteroatmospheric fistulization ('complicated failure'), antibiotherapy especially targeting the core organisms is initiated. If there is infection of the surgical site, gram-positive bacteria should also be considered, particularly *S. aureus*.
- Antimicrobial treatment of proven infection should be limited to four to seven days, provided adequate source control is achieved. Longer treatment duration has not been associated with further improvement. Source control is the most important step determining treatment duration.
- If there is persistent or recurrent infection after antimicrobial therapy of four to seven days or if initial empiric antimicrobial therapy does not result in a satisfactory clinical response, investigation into extra-abdominal sources of infection (pneumonia, urinary tract infection, bloodstream infection, etc.) and noninfectious inflammatory conditions is recommended. The role of intra-abdominal hypertension and abdominal compartment syndrome in source control should also be evaluated.
- Table 5 serves as a summary of the consesus report.

Acknowledgements

Experts from the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey (EKMUD) as well as the Turkish Surgical Association, Turkish Society of Colon and Rectal Surgery, Hernia Society, Turkish Society of Hepato-pancreato-biliary Surgery, and the Turkish Society of Hospital Infections and Control participated in the making of this report, and the English version will be published in the Turkish Journal of Surgery.

Financial Support

The meetings which took place during the preparation of this report were held at the Ankara EKMUD headquarters, and the participants' travel and accommodation expenses were paid by EKMUD. Other than this, the committee members received no financial support.

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Ulus Cerrahi Derg 2016; 32: 322
DOI: 10.5152/UCD.2016.3697

Different shoes walking the same path: implant migration

Aynı yolu yürüyen farklı ayakkabılar: implant migrasyonu

Mahir Gachabayov

Dear Editor,

I read the case report by Ece et al. (1) with great interest for what I would like to extend my thanks. Such clinical entities are faced in almost all specialties of medicine and surgery what encourages to try to generalize them under the common term "implant migration" and to explain the possible similar underlying pathogenesis. Examples are migrated hernia meshes, hemostatic clips, contraceptive implants and so on (2, 3).

The question is: "Why implants migrate?" The most common cause of migration of hernia plugs has been shown to be poor surgical technique (4). Without any doubt, an implant should be fixed in place adequately what will probably prevent at least early migration. Adequately fixed implants (either meshes, clips or other implanted prostheses) can also migrate as a result of sliding via external forces and enter adjacent structures at points of least resistance (2).

Following the implantation of biomaterials, host reactions incorporate a combination of many processes including blood-material interactions, inflammation (acute then chronic), development of granulation tissue, foreign body reaction, and fibrous capsule development (5). Blood-material interaction, which is characterized by protein adsorption to the implant surface and formation of transient provisional matrix, is followed by acute inflammation which lasts about two weeks (5). If implant infection occurs, acute inflammation can persist beyond the third week and subsequent phases of host reaction, such as granulation and fibrous capsule formation, can be defective. This means that the implant will not be adequately fixed in place by fibrous tissue and can migrate easily conquering surrounding tissues at points of least resistance. This pathogenesis concerns surgically-implanted biomaterials that are embedded in tissues, and all sides and/or parts are surrounded by tissues.

A different type of implants is intraluminal implants that are generally implanted by means of endoscopy or interventional radiology, such as bands, clips, stents, which would disconnect from previously contacting tissues or migrate along the lumen rather than migrate to adjacent tissues or organs. This is because the least resistance around the implant is the lumen of the hollow organ.

It is worth emphasizing that another distinct type of implants is "pressure-applying" implants, such as vertical banded gastroplasty meshes, which tend to migrate toward the vector of applied pressure, that is, the gastric lumen (1). The pathogenesis here is again migration toward least resistance, the constricted gastric wall being the site of least resistance.

To conclude, the pathogenesis of migration of different implants is the same. Therefore, they are "different shoes walking the same path". This clinical entity should probably be generalized under the unique term "implant migration".

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Received / *Geliş Tarihi*: 26.08.2016
Accepted / *Kabul Tarihi*:14.09.2016

Available online at
www.ulusalcerrahidergisi.org

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Ulus Cerrahi Derg 2016; 32: 323
DOI: 10.5152/UCD.2016.03102016

Amerikan Tiroid Birliği'nin 2015 kılavuzu ile neler değişti?

What has changed with 2015 American Thyroid Association Management Guidelines

Taner Kıvılcım[1], Atakan Sezer[2], Özer Makay[3]

Sayın Editör,

Field ve Lohr, 1990'da klinik kılavuzların amacını "özellikli klinik durumlarda uygun sağlık hizmetinin sunulabilmesi adına hekim ve hasta kararlarına yardımcı olmak için sistematik olarak geliştirilen raporlardır" şeklinde tanımlamışlardır. Son yirmi yılda klinik kılavuzlar, uzman görüşlerinden kanıta dayalı tıp verilerine doğru bir evrim geçirmiştir (1).

Tiroid nodülleri, özellikle yüksek rezolüsyonlu ultrason görüntülemelerinin kullanımı ile birlikte, yaygın bir klinik durum olarak karşımıza çıkmaktadır (2). Tiroid nodüllerinin klinik önemi %7-15 oranında malignite saptanmasından kaynaklanmaktadır (3, 4).

ATA (American Thyroid Association), 1996 yılında "*Tiroid Nodülü ve Diferansiye Tiroid Kanseri (DTK) olan Hastalar için Tedavi Rehberi"*ni hazırlamış, 2006 yılında ise ilk kılavuzunu yayınlamıştır. İlk güncellemesi 2009 yılında yapılan kılavuzun en son güncellemesi ise 2016 yılının başında *Thyroid (DOI: 10.1089/thy.2015.0020)* dergisinde '2015 yılı kılavuzu' olarak yayınlanmıştır. Rakamlarla kabaca bir fikir edinmek gerekirse, 2009 yılındaki kılavuz 48 sayfa ve 437 kaynaktan oluşmakta iken son güncelleme ile 1078 kaynak gösterilerek 411 sayfalık ayrıntılı bir kılavuz oluşturulmuştur. Bu güncelleme ile 8 yeni soru, 21 yeni öneri ve 21 öneride anlamlı değişiklik olduğu görülmektedir (5, 6).

Bu ayrıntılı kılavuz tiroid nodülleri ve diferansiye tiroid kanserleri ile ilgili olarak birçok durumda yol gösterici olmakla beraber, ülkemizdeki cerrahların bu bilgilerini güncellemeleri için kılavuzdaki değişiklikleri değerlendirmeyi ve Türkçe olarak paylaşmayı hedefledik. Elbette bu kılavuzlar hükümden ziyade tamamlayıcı bilgi olarak değerlendirilmeli ve yargı için bağlayıcı olmadıkları akılda tutulmalıdır. Yorumlamada, kılavuzların hazırlanması sürecinde ekonomik olanaklara odaklanılmadığı ve ülkelerarası şartların farklı olabileceği göz önünde bulundurulmalıdır. Hazırlanan derlemeye şu linkten ulaşılabilmektedir: http://www.ulusalcerrahidergisi.org/ozet/1450

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Geliş Tarihi / *Received*: 30.09.2016
Kabul Tarihi / *Accepted*:03.10.2016

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