GENEL CERRAHİDE MODERN YAKLAŞIMLAR:

CERRAHİ PLANLAMA, İLERİ TEKNOLOJİLER VE REKONSTRÜKSİYON

EDİTÖR
DR. ÖĞR. ÜYESİ ORUÇ NUMAN GÖKÇE





BİDGE Yayınları

BİDGE Yayınları

Genel Cerrahide Modern Yaklaşımlar: Cerrahi Planlama, İleri Teknolojiler ve Rekonstrüksiyon

Editör: Dr. Öğr. Üyesi ORUÇ NUMAN GÖKÇE

ISBN: 978-625-5057-99-0

1. Baskı
Sayfa Düzeni: Gözde YÜCEL
Yayınlama Tarihi: 2026-10-25
BİDGE Yayınları

Bu eserin bütün hakları saklıdır. Kaynak gösterilerek tanıtım için yapılacak kısa alıntılar dışında yayıncının ve editörün yazılı izni olmaksızın hiçbir yolla çoğaltılamaz.

Sertifika No: 71374
Yayın hakları © BİDGE Yayınları
www.bidgeyayinlari.com.tr - bidgeyayinlari@gmail.com
Krc Bilişim Ticaret ve Organizasyon Ltd. Şti.
Güzeltepe Mahallesi Abidin Daver Sokak Sefer Apartmanı No: 7/9 Çankaya / Ankara

İÇİNDEKİLER

KARACİĞER DONÖR VOLÜMETRİSİNİN TEMEL İLKELERİ VE KLİNİK UYGULAMALARI 1
KEMAL BARIŞ SARICI

HIATAL HERNIA 8
EBUBEKİR KORUCUK, ALİ RIZA AVUL

THE ROLE OF PATIENT MONITORING AND DIGITAL TECHNOLOGIES IN BARIATRIC SURGERY PROCEDURES 25
ABDULLAH CİME

LOKAL İLERİ MEME KANSERLERİNDE REKONSTRÜKSİYON YÖNTEMLERİ: PALYATİF YAKLAŞIMDAN YAŞAM KALİTESİNE 37
BÜLENT SULTANOĞLU

BÖLÜM 1

KARACİĞER DONÖR VOLÜMETRİSİNİN TEMEL İLKELERİ VE KLİNİK UYGULAMALARI

KEMAL BARIŞ SARICI1

Giriş

Karaciğer donör volümünün hesaplanması, özellikle canlı vericili karaciğer transplantasyonunda donör güvenliği, greft yeterliliği ve rezidüel karaciğer hacminin korunması açısından oldukça önemli bir konudur(Lee, 2015)

Volüm Hesaplamanın Önemi

Canlı vericili karaciğer nakli, kadavradan organ temininin yetersiz olduğu durumlarda önemli bir alternatiftir. Donör güvenliği en öncelikli konudur. Nakil başarısı için hem alıcı hem donör açısından karaciğer volümü kritik önemdedir. Canlı donör transplantasyonunda volümetrik planlamanın amacı, donör güvenliği ve alıcı için yeterli greft hacminin sağlanmasıdır.

Donör rezidüel karaciğer oranı

[1] Doç.Dr., İnönü Üniversitesi Karaciğer Nakli Enstitüsü, Orcid: 0000-0001-8237-9701

Donörün çıkarılacak greft sonrasında geride kalacak karaciğer hacminin, ameliyat öncesi total karaciğer hacmine oranıdır.

GRWR (Graft-to-Recipient Weight Ratio) Formül

GRWR= Greft Ağırlığı(g)/ Alıcı ağırlığı(kg)x100

Minimum Gereksinim**,** Yetişkin alıcıda genellikle ≥ **0.8–1.0%** olmalıdır.

Örnek Hesaplama

Alıcı ağırlığı: 70 kg

Greft ağırlığı: 700 g

GRWR= 700/70x100

%1

Uygun bir oran.

İyi fonksiyonel durumu ve minimal portal hipertansiyonu olan alıcılarda, bazı karaciğer nakli merkezi tarafından 0,6'ya kadar daha düşük bir GRWR kabul edilebilir. (Mingzheng et al.,2026)

Small for-size sendromu ve erken greft failure ı önlemek için GRWR %0,8'den az olmamalıdır.

- Ameliyat sonrası karaciğer yetmezliğini önlemek için, donörün fonksiyonel karaciğer remnant FLR (fonksiyonel liver remnant) hacmi başlangıç hacminin %30'undan az olmamalıdır.
- Ancak, yaşlı donörlerde ve steatozlu donörlerde, donör karaciğerinin fizyolojik karaciğer rezervinin azalması göz önünde bulundurularak, kabul edilebilir FLR > %35–40 olmalıdır.

Sağ lob greft mi almalı, sol lob greft mi almalı?

- Sol lob greftleri donör morbiditesini azaltmıştır ancak daha düşük hacimlere sahiptirler, sağ lob greftleri ise daha yüksek donör morbiditesine sahiptir.
- Sol loblar başlangıçta sadece bebekler için kullanılsa da, geçtiğimiz on yıldaki deneyimler, GRWR kriterlerini karşılayan daha az şiddetli portal hipertansiyon derecesine sahip yetişkinlerde kullanımlarını sağlamıştır.

Riskler ve Sınırlar

Greft çok küçükse, Alıcıda Small-for-size sendromu gelişebilir.

Greft çok büyükse, Teknik olarak cerrahi zorluklar oluşabilir.

Donörün remnant karaciğeri yetersiz kalırsa karaciğer yetmezliği gelişebilir.

Her donör adayınının volümü hesaplanmalı mı?

Tomografi başında ki önceliklerimiz:

-Hepatosteatoz

-Vasküler anatomi

Hepatosteatoz

Donör greftindeki her %1’ lik yağ artışının karaciğerin işlevsel kütlesini %1 oranında azalttığı ve ayrıca mikrosirkülasyonu bozabileceği varsayılmıştır. Normal karaciğer, kontrastsız bir BT taramasında dalaktan daha yüksek bir LAI (liver attenuation index)’ e sahiptir. LAI, karaciğer ve dalak üzerinde birden fazla yere en az 1 cm2'lik dairesel bir ilgi alana yerleştirilerek ROI (Regıon of Interes) ve ortalama karaciğer attenüasyonu ile ortalama dalak attenüasyonu arasındaki fark hesaplanarak hesaplanır.

Normal bir karaciğerin attenüasyon değeri yaklaşık 50–57 Hounsfield Ünitesi'dir (HU), bu da dalağınkinden yaklaşık 10 HU daha fazladır.

-5 HU' dan büyük LAI değerleri, önemli makrovasküler steatozun yokluğunu öngörür.

-10 ila 5 HU arası LAI değerleri hafif ila orta dereceli steatozu (6–30%) gösterir.

-10 HU'dan düşük LAI değerleri orta ila şiddetli hepatik steatozu (yani, %30 yağ) gösterir. (Sağır, 2008)

Vasküler Anatomi

Hepatik arter, portal ven ve hepatik ven anatomisi, donörün güvenliği ve vaskülaritesinden ödün vermeden alıcıda rekonstrüksiyona uygun olmalıdır. Ameliyat öncesi manyetik rezonans kolanjiyopankreatografi (MRCP), safra anatomisini belirlemek için yapılır ve bu, hemen hemen tüm karaciğer nakli merkezlerinde rutin olarak İntraoperatif kolanjiyografi (IOC) ile daha da doğrulanır. Görüntüleme, cerrahı yönlendirebilen anormal vasküler anatomi veya safra anomalilerinin tanımlanmasını sağlar.

Karaciğer Hacim Ölçüm Yöntemleri

BT Volümetri: En sık kullanılan yöntemdir.

MR Volümetri: Alternatif yöntem olarak kullanılabilir.

3D Rekonstrüksiyon Yazılımları ile daha hassas ölçümler yapılabilir.

Her donöre biyopsi yapalım mı?

Karaciğer biyopsisinin olası olumsuz etkileri (ağrı, kanama ve ölüm) ve steatozun düzensiz/yama benzeri yapısı nedeniyle tutarsız sonuçları göz önüne alındığında, birçok merkezde karaciğer steatozunu değerlendirmek için invaziv olmayan yöntemler tercih

ediliyor. MRI tabanlı teknikler, hepatik steatozun değerlendirilmesinde umut verici görünüyor.

Klinik eşik değerleri ve alıcı greft yeterliliği

Alıcıda greft yeterliliği, yalnızca anatomik hacimle değil, greftin fonksiyonel kalitesi ve hemodinamik koşullarla da ilişkilidir. Küçük greft sendromu (small-for-size syndrome, SFSS), greftin alıcının gereksinimlerini karşılayamamasıyla ortaya çıkabilen klinik bir tablodur. Portal hiperperfüzyon, venöz konjesyon, greft kalitesi ve alıcının hastalık şiddeti bu tabloda rol oynayabilir. (Dahm et al.,2005)

Volüm ile gerçek greft ağırlığı arasındaki fark

BT volümetrisinde ölçülen hacmin mililitre cinsinden verilmesi, aynı sayısal değerin gram cinsinden gerçek greft ağırlığına eşit olduğu anlamına gelmez. Çalışmalar, özellikle sağ lob greftlerinde radyolojik hacmin gerçek greft ağırlığını olduğundan yüksek tahmin edebildiğini ve ölçüm sonuçlarının yazılım ile değerlendiriciye göre değişebildiğini göstermektedir (Law &Kow 2025).

Bu farklılıkların olası nedenleri şunlardır:

Segmentasyon sınırlarının ve planlanan transeksiyon düzleminin farklı belirlenmesi.

Kan ve damar içeriğinin hacim ve ağırlık ölçümünü farklı etkilemesi.

Parankim yoğunluğu ve steatoz gibi doku özellikleri.

Ameliyat sırasında elde edilen greftin şeklinin ve sınırlarının sanal modelden farklı olması.

Bu nedenle greft seçimi yalnızca tek bir hacim tahminine dayandırılmamalı; mümkün olduğunda geçmiş olgulardan elde edilen merkeze özgü hacim-ağırlık uyumu verileriyle desteklenmelidir. (Celik, 2024).

Sonuç

Karaciğer donör volümetrisi, canlı vericili karaciğer transplantasyonunda donör güvenliği ile alıcı greft yeterliliğini dengeleyen temel bir planlama aracıdır. BT ve MR temelli üç boyutlu analizler, total karaciğer, greft ve rezidüel karaciğer hacimlerinin ölçülmesini sağlar. Rezidüel karaciğer oranının yaklaşık %30 veya üzerinde tutulması ve erişkin alıcıda GRWR'nin %0,8 üzerinde olması yaygın kullanılan referanslardır. Bununla birlikte, bu eşikler bireysel klinik değerlendirmeyi ortadan kaldırmaz.

Temel klinik mesaj: Güvenli donör seçimi ve yeterli greft planlaması, hacim hesaplamalarının anatomik, fonksiyonel ve hemodinamik değerlendirmelerle birlikte yorumlanmasını gerektirir. Hiçbir tekil volümetrik ölçüm, tek başına transplantasyonun güvenliğini garanti etmez.

Kaynakça/References

1. Lee, G. (2015). A complete treatment of adult living donor liver transplantation: A review of surgical technique and current challenges to expand indication of patients. *American Journal of Transplantation, 15*(1), 17–38. https://doi.org/10.1111/ajt.12907
2. Mingzheng, C. (2026). Determining the critical graft-to-recipient weight ratio threshold for safety in full-right/full-left split liver transplantation: A multicentric cohort study. *American Journal of Transplantation, 26*, 1714–1723. https://doi.org/10.1016/j.ajt.2026.03.009
3. Sağır, A. (2008). *Comparison of liver attenuation index calculated in preoperative radiological evaluation of the donor with the degree of steatosis in living donor liver transplantation* [Uzmanlık tezi, İnönü Üniversitesi].
4. Felix, S. (2005). Small-for-size syndrome after partial liver transplantation: Definition, mechanisms of disease and clinical implications. *American Journal of Transplantation, 5*, 2605–2610. https://doi.org/10.1111/j.1600-6143.2005.01081
5. Law, P. (2025). Prediction and management of small-for-size syndrome in living donor liver transplantation. *Clinical and Molecular Hepatology, 31*(Suppl.), S301–S326. https://doi.org/10.3350/cmh.2024.0870
6. Celik, A. (2024). Manual and semi-automated computed tomography volumetry significantly overestimates the right liver lobe graft weight: A single-center study with adult living liver donors. *Diagnostic and Interventional Radiology*. https://doi.org/10.4274/dir.2023.221903

BÖLÜM 2
HIATAL HERNIA

1.EBUBEKIR KORUCUK[1]

2. ALI RIZA AVUL[2]

Introduction

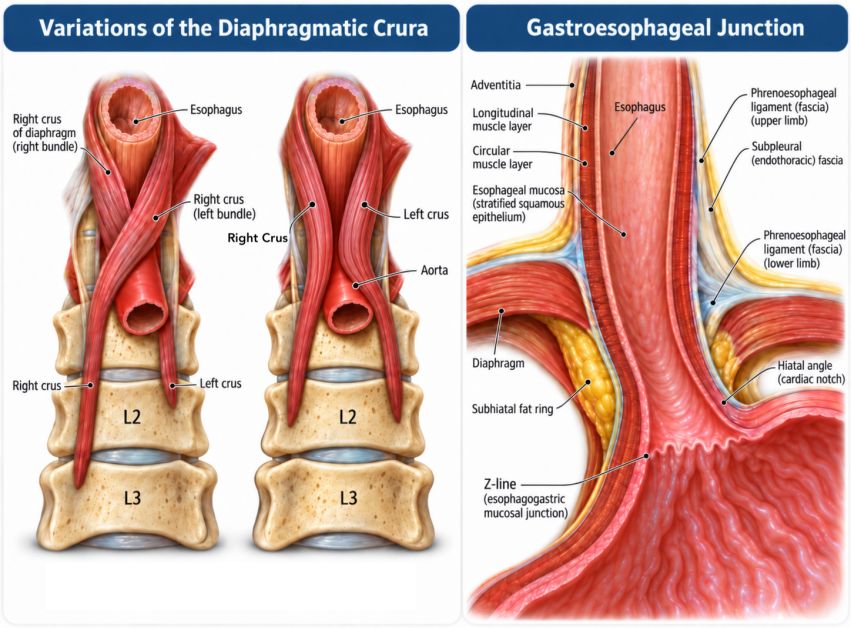
Hiatal hernia is the displacement of abdominal structures, primarily the stomach, into the thorax through the esophageal hiatus of the diaphragm. The disease encompasses a clinical spectrum ranging from a small anatomical alteration detected incidentally to a large hernia causing reflux, bleeding, mechanical obstruction, and gastric ischemia. Therefore, evaluation should consider not only the presence of the hernia but also its type, its relationship with symptoms, concomitant gastroesophageal reflux disease, and the patient's physiological reserve (Daly et al., 2024; Kahrilas et al., 2008; Katz et al., 2022).

1. Anatomy

The esophageal hiatus is a muscular ring formed by the right crus of the diaphragm. Most of the muscle fibers originate from the right crus, whereas the left crus makes a more limited contribution to the formation of the hiatus. (Figure 1) Within the hiatus, the esophagus is attached to the diaphragm by the phrenoesophageal ligament (membrane). This ligament is an elastic structure arising from the subdiaphragmatic fascia and helps maintain the esophagogastric junction within the abdominal cavity while permitting esophageal movement during respiration and swallowing (Dean et al., 2012). The main components of the antireflux barrier are the lower esophageal sphincter, crural diaphragm, phrenoesophageal ligament, angle of His, and the “flap valve” effect of the gastric fundus. (Figure 1) Hiatal hernia disrupts several components of this barrier simultaneously (Kahrilas et al., 2008; Roman & Kahrilas, 2014).

[1] Dr., Hakkari State Hospital, General Surgery, 0000-0002-1272-6103
[2] Dr., Hakkari State Hospital, General Surgery, 0000-0002-9853-1912

Figure 1. Anatomy of diaphragmatic crura and gastroesophageal junction

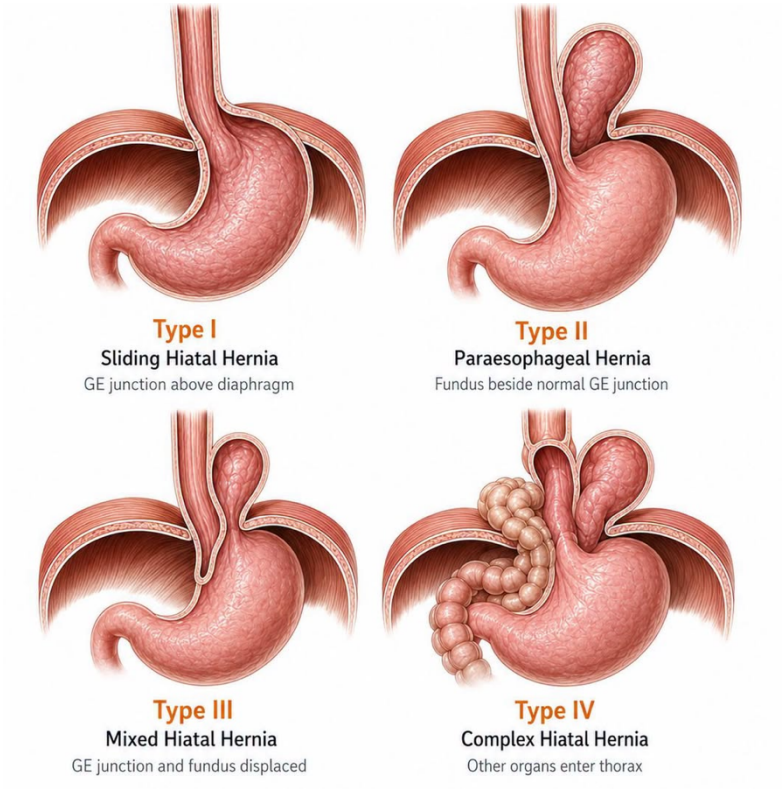


2. Classification

Type I is a sliding hiatal hernia, in which the gastroesophageal junction and proximal stomach ascend above the diaphragm. It is the most common type, and its clinical significance is largely related to reflux. Type II is a true paraesophageal hernia, in which the gastroesophageal junction remains in its normal position while the fundus herniates into the thorax alongside the esophagus. Type III is a mixed hernia in which sliding and paraesophageal components coexist. In type IV, in addition to the stomach, the colon, small intestine, or other abdominal structures pass through the hiatus into the thorax. (Figure 2) Type II–IV hernias are considered within the paraesophageal hernia group (Daly et al., 2024; Kahrilas et al., 2008).

There is no universally accepted definition of a “giant” paraesophageal hernia. Studies have used different thresholds, such as one-third or more than half of the stomach being located in the thorax. Therefore, the term giant hernia is not synonymous with type IV (Bhargava & Andrade, 2020).

Figure 2. Hiatal hernia classification



3. Epidemiology

Determining the true population prevalence of hiatal hernia is difficult, and estimates vary widely according to the diagnostic method and the population studied. In Western populations, the prevalence of hiatal hernia in adults has been reported to range from approximately 10% to 50%; its frequency increases markedly with age and may reach high rates in individuals older than 50 years (Hyun & Bak, 2011; Roman & Kahrilas, 2014). The vast majority of hiatal hernias (approximately 90–95%) are type I; paraesophageal hernias account for approximately 5–15% of all hiatal hernias (Hutter & Rattner, 2007; Sfara & Dumitrascu, 2019).

A substantial proportion of patients are asymptomatic, and the hernia is detected incidentally during imaging or endoscopy performed for another reason. In symptomatic cases, the main complaints are reflux symptoms. In patients with gastroesophageal reflux disease (GERD), hiatal hernia is associated with disease severity (erosive esophagitis, Barrett's esophagus) and lack of response to medical treatment (Hyun & Bak, 2011).

Whereas the sex distribution is approximately equal in type I hernias, large paraesophageal hernias are more frequently seen at advanced ages (usually 60–70 years and older) and in women. The increasing number of patients with aging further highlights the importance of comorbidity and functional status in surgical decision-making (Roman & Kahrilas, 2014; Stylopoulos et al., 2002).

4. Etiology and Pathophysiology

The development of hiatal hernia is usually multifactorial. Age-related loss of the elastic properties of connective tissue, laxity of the phrenoesophageal attachments, and widening of the hiatus are among the principal mechanisms. Histological studies examining the supporting ligaments of the gastroesophageal junction have demonstrated reduced elastic fiber content in patients with hiatal hernia. These findings support structural weakness; however, whether this change is a cause of hernia development or a consequence of repeated mechanical strain has not been fully clarified (Apaydin et al., 2008; Curci et al., 2008).

The pressure difference between the abdominal and thoracic cavities facilitates displacement of the stomach toward the hiatus. Conditions such as obesity, pregnancy, chronic cough, repeated straining, and vomiting may increase this mechanical load. The association of obesity with both hiatal hernia and reflux indicates that it may influence symptoms through more than one mechanism. A history of heavy lifting or a single episode of straining does not provide an etiological explanation in every patient; the disease generally develops through the combined effects of long-term tissue changes and pressure loading (Menon & Trudgill, 2011; Sfara & Dumitrascu, 2019).

Longitudinal contractions of the esophagus allow the junction to move upward during swallowing. Normally, this movement is temporary; when the supporting tissues weaken, axial displacement may become permanent. Chronic inflammation, fibrosis, and esophageal shortening associated with reflux may also contribute to the process in some patients (Roman & Kahrilas, 2014; Siegal et al., 2017).

In paraesophageal hernia, the clinical disorder extends beyond reflux. The herniated stomach may have difficulty emptying because of angulation or entrapment at the level of the hiatus. Organoaxial or mesenteroaxial rotation may cause partial or complete obstruction. Impaired venous return may be followed by wall edema and ischemia; in advanced cases, necrosis and perforation may occur. A large intrathoracic stomach may also affect lung volumes and the function of adjacent structures. These mechanisms explain why postprandial pain, early satiety, and dyspnea may be related to the hernia even in patients without heartburn (Bhargava & Andrade, 2020; Myers et al., 2021).

5. Clinical Evaluation and Diagnosis

5.1. Clinical Findings

Typical symptoms of sliding hiatal hernia are retrosternal burning and regurgitation. Symptoms may increase after meals, on bending forward, or when lying down. Dysphagia, chest pain, chronic cough, and hoarseness may occur; however, the specificity of extraesophageal manifestations in particular is low. Identification of a hiatal hernia on imaging does not prove that all these complaints arise from the hernia. Evaluation of cardiac, pulmonary, and other esophageal causes is part of the diagnostic process (Katz et al., 2022; Sfara & Dumitrascu, 2019).

In paraesophageal hernia, early satiety, postprandial epigastric or thoracic pain, solid-food dysphagia, vomiting, and reduced oral intake may predominate. Patients may relieve their symptoms by reducing meal sizes and, because of this behavior, describe themselves as

asymptomatic. Weight loss, avoidance of meals, signs of aspiration, and reduced exercise capacity should also be specifically assessed in the history. Dyspnea accompanying a large hernia may be related to mechanical compression or reflux; improvement in respiratory function after repair has been reported in selected patients after other causes have been excluded (Gray et al., 2015).

Cameron erosions and ulcers developing at the level of the hiatus may cause iron deficiency anemia through chronic occult bleeding. These lesions may be missed during the initial endoscopy; careful examination of the hernia sac and the area of diaphragmatic constriction is required. When anemia is identified, other causes of gastrointestinal bleeding should also be investigated rather than accepting an explanation attributed solely to the hernia (Gray et al., 2015).

Sudden severe epigastric or chest pain, unproductive retching, and inability to advance a nasogastric tube constitute the classic Borchardt triad suggestive of gastric volvulus. Not all components of the triad are present in every patient. Persistent vomiting, hematemesis, hemodynamic deterioration, sepsis, or signs of peritonitis require urgent evaluation for acute obstruction and ischemia. In such circumstances, treatment is not delayed to complete elective reflux investigations (Dreifuss et al., 2020).

5.2. Endoscopy and Radiological Examinations

Upper gastrointestinal endoscopy enables assessment of esophagitis, peptic stricture, Barrett's esophagus, malignancy, and Cameron lesions. The distance between the gastroesophageal junction and the diaphragmatic pinch provides information about a sliding hernia (often >2 cm). However, air insufflation, respiratory movements, and misinterpretation of anatomical landmarks may affect the measurement. The esophagogastric junction and Hill grade are evaluated on retroflexion. Particularly in Barrett's esophagus, the Z-line is not a reliable synonym for the gastroesophageal junction; the proximal limit of the gastric folds and the diaphragmatic impression should be assessed together (Hyun & Bak, 2011; Roman & Kahrilas, 2014).

Barium esophagography dynamically demonstrates the course of the esophagus, the position of the gastroesophageal junction, the intrathoracic stomach, rotation, and bolus transit. It is valuable for surgical planning in large paraesophageal hernias and complements endoscopy in patients with dysphagia or suspected recurrence. In small sliding hernias, discordance may occur between methods. Different findings do not necessarily mean that one examination is incorrect; the examinations assess a dynamic junction under different conditions (Roman & Kahrilas, 2014; Tolone et al., 2018).

Computed tomography is not necessary for every small sliding hernia. In giant or type IV hernias, it is used to identify the herniated organs and adjacent structures and, in acute presentations, to investigate signs of volvulus, obstruction, perforation, and ischemia. A retrocardiac air collection or air–fluid level may be seen on chest radiography; however, a normal radiograph does not exclude hiatal hernia and is insufficient for detailed surgical planning (Dreifuss et al., 2020; Kim et al., 2021).

5.3. Functional Tests

High-resolution esophageal manometry may demonstrate separation of the lower esophageal sphincter and crural diaphragm and assesses esophageal motility. Its primary importance before an antireflux procedure is to identify achalasia and severe motility disorders, thereby preventing inappropriate fundoplication. In large paraesophageal hernias, failure to advance the catheter into the stomach or catheter coiling may complicate measurement; results should also be interpreted in terms of technical adequacy (Kim et al., 2021; Trudgill et al., 2019).

Ambulatory pH or pH-impedance monitoring is used particularly in patients without definitive evidence of reflux on endoscopy who are being considered for antireflux surgery. When reflux is suspected but has not previously been objectively demonstrated, testing is generally performed off acid-suppressive treatment. In established reflux disease, if complaints persist despite appropriate therapy, pH-impedance monitoring on treatment may be selected. The anatomical diagnosis of a hernia and the demonstration of pathological reflux answer different questions; the presence of one does not always make testing for the other unnecessary (Katz et al., 2022; Trudgill et al., 2019).

The ICARUS consensus emphasizes the importance of endoscopic evaluation, manometry, and reflux monitoring in appropriate surgical candidates. Barium examination is also useful when a hiatal hernia or short esophagus is suspected. Investigations are selected according to the patient's symptoms and the planned intervention; complete functional evaluation is not awaited when acute strangulation is suspected. The differential diagnosis includes achalasia, esophageal spasm, eosinophilic esophagitis, malignancy, rumination syndrome, functional heartburn, and gastroparesis. Particularly in treatment-resistant complaints, misdiagnosis is one of the preventable causes of unsuccessful surgery (Pauwels et al., 2019).

6. Treatment

6.1. Conservative and Medical Treatment

A small asymptomatic type I hernia is not, by itself, an indication for surgery. The initial approach in symptomatic sliding hernia is generally directed toward controlling reflux. Weight loss in overweight patients, avoidance of eating during the two to three hours before bedtime, and elevation of the head of the bed in those with nocturnal symptoms may be recommended. Smaller meals and avoidance of foods individually identified as aggravating symptoms are helpful. Rather than providing all patients with a long standardized list of restrictions, identifying behaviors associated with symptoms facilitates adherence to treatment (Katz et al., 2022; Sfara & Dumitrascu, 2019).

Proton pump inhibitors are the principal drug group for reflux-related complaints and esophagitis; they do not close the hiatal defect or treat mechanical obstruction. When treatment response is inadequate, the first step is to evaluate adherence, dosage, and administration of the medication at the appropriate time. In patients who require them, alginates or H_2 receptor antagonists may provide additional options. Routine use of prokinetics without objective

evidence of gastroparesis is not appropriate. Not all complaints that fail to improve with medication should be regarded as ongoing acid reflux (Katz et al., 2022).

For anemia caused by Cameron lesions, acid suppression, iron replacement, and assessment of medications that may increase bleeding constitute initial treatment. Endoscopic hemostasis may be required in active bleeding. Recurrent bleeding or anemia despite appropriate treatment warrants surgical evaluation, particularly when associated with a large hernia. In paraesophageal hernia, medical treatment may reduce symptoms but does not eliminate the anatomical abnormality or the possibility of volvulus (Dreifuss et al., 2020; Gray et al., 2015).

6.2. Surgical Indications and Patient Selection

In type I hernia, the decision to operate is mostly based on objectively documented reflux disease. Persistent regurgitation, complaints that significantly impair quality of life, severe reflux associated with a large hernia, or the patient's preference regarding long-term treatment options are evaluated. Failure to respond to a proton pump inhibitor does not automatically imply benefit from surgery. Before surgery, the relationship of symptoms to reflux, motility, and the patient's expectations should be clarified (Pauwels et al., 2019; Slater et al., 2021).

Repair is recommended for appropriate surgical candidates with symptomatic type II–IV hernias. Obstruction, volvulus, dysphagia, postprandial pain, recurrent bleeding, and hernia-related respiratory complaints are taken into account. The approach to truly asymptomatic patients is controversial. The SAGES 2024 guideline emphasizes the insufficiency of direct comparative evidence and includes individualized decision-making and observation in appropriate patients. The EAES 2023 guideline conditionally supports surgery for asymptomatic or mildly symptomatic patients with moderate-to-large paraesophageal hernias within its scope, while recommending a conservative approach in frail patients (Daly et al., 2024; Markar et al., 2023).

This difference reflects uncertainty in the evidence and variability among patient groups. The decision should not be reduced solely to age or the size of the hernia in centimeters. Frailty, cardiopulmonary diseases, functional independence, nutritional status, symptom burden, and patient preferences are assessed together. Studies using frailty indices have shown that physiological reserve is associated with complications and postdischarge care needs. When observation is chosen, patients are informed about reasons to seek reassessment, such as acute pain, persistent vomiting, bleeding, and impaired oral intake (Chimukangara et al., 2016).

6.3. Preoperative Preparation and Surgical Approach

Nutritional deficiencies, anemia, respiratory diseases, and uncontrolled comorbidities should be corrected before elective surgery. Large database studies examining paraesophageal hernia repairs have demonstrated an association of anemia and malnutrition with adverse outcomes. Smoking cessation, appropriate thromboembolism prophylaxis, and assessment of perioperative aspiration risk are also important. Alongside reflux control, the patient should be

informed about temporary dysphagia, gas bloating, recurrence, and the possibility of reoperation (Clark et al., 2018).

The laparoscopic transabdominal approach is commonly used for elective repair in experienced centers. Robotic surgery may offer technical advantages for mediastinal dissection and suturing; however, it has not been established that it provides better long-term outcomes in every patient. An open or thoracic approach may be used in complex anatomy, selected reoperations, extensive adhesions, or circumstances in which a minimally invasive technique is unsafe. Regardless of the surgical platform, the key elements determining repair quality are accurate exposure of the anatomy and reduction of tension (Dreifuss et al., 2020; Siegal et al., 2017).

6.3.1. Fundamental Steps of Repair

The first step is controlled reduction of the herniated organs into the abdomen and separation of the hernia sac from the mediastinal structures. In large hernias, merely pulling the stomach downward is not sufficient; adequate mobilization of the sac and esophagus is required. During dissection, the vagal trunks, pleura, pericardium, and esophageal wall are protected. The risk of thermal injury should be considered when energy devices are used close to the esophagus. Unnecessary stripping of the surface covering of the crura may reduce their suture-holding capacity (Kohn et al., 2013; Siegal et al., 2017).

After mediastinal mobilization, the gastroesophageal junction should remain within the abdomen without continuous downward traction. A tension-free intra-abdominal esophageal length of approximately 2.5–3 cm is targeted. If this length cannot be achieved despite adequate mobilization, a true short esophagus may be considered, and Collis gastroplasty may be performed in selected patients. This technique creates a tubular extension from gastric tissue; therefore, the resulting segment does not possess the same physiological characteristics as the normal esophagus. Collis gastroplasty performed with appropriate indications in expert centers has been reported to provide benefit without adversely affecting quality of life (Nason et al., 2011).

The hiatus is usually closed by approximating the crura with sutures posterior to the esophagus. Closure should not place excessive tension on the tissue or narrow the esophageal passage. Anterior or additional sutures may be required depending on the geometry of the defect. A very wide hiatus or weak tissue complicates repair; in such circumstances, relaxing procedures or selected reinforcement methods may be considered. Esophageal length, hiatal width, and tissue strength are not evaluated independently; correcting one problem should not create new tension or obstruction in another area (Kohn et al., 2013).

6.3.2. Mesh Use

The aim of mesh use is to support the crural repair and reduce recurrence. Permanent synthetic, biological, and absorbable synthetic materials do not have identical properties; results obtained with one material cannot be generalized to all types of mesh. Long-term follow-up of a

multicenter randomized study using biological reinforcement reported that the initially observed recurrence advantage was not maintained (Oelschlager et al., 2011; Watson et al., 2020).

At 13-year follow-up of a randomized trial, recurrence was found in 38% after repair with permanent mesh and 31% in the suture-only group, with no significant superiority demonstrated. It should be remembered that this study evaluated patients with sliding hernias undergoing antireflux surgery; the results cannot be directly extrapolated to all giant paraesophageal hernias. The SAGES 2024 panel could not formulate a recommendation either for or against routine mesh use. The conditional recommendation in favor of mesh in a specific paraesophageal hernia group in the EAES guideline indicates that the debate continues (Analatos et al., 2024; Chimukangara et al., 2016; Daly et al., 2024).

The decision to use mesh should consider possible benefits as well as erosion, fibrosis, stenosis, and difficulties during reoperation. Minimizing direct contact with the esophagus and ensuring secure fixation are important. Although complications caused by a permanent implant are rare, they may be serious. Current studies do not demonstrate that any single material or placement technique is the best option for all patients; patients should be informed that recurrence may not be completely prevented and that implant-related problems may occur in the long term. Therefore, mesh use is not routine; it should be considered in selected circumstances such as large defects, poor tissue quality, a hiatus closed under tension, and revision surgery, with due regard to the surgeon's experience and awareness of mesh complications (Petric et al., 2022; Spiro et al., 2020).

6.3.3. Fundoplication and Gastropexy

Repairing the hernia alone does not adequately restore the antireflux barrier in every patient. Fundoplication may be added to the repair to reduce postoperative reflux. Total (Nissen fundoplication, 360 degrees) or partial (Toupet fundoplication, approximately 270 degrees posteriorly; Dor fundoplication, approximately 90 degrees anteriorly) fundoplication techniques may be performed (Li et al., 2025). The reflux burden, baseline dysphagia, esophageal motility, patient preference, and surgeon experience are considered in the choice. The SAGES reflux guideline supports discussing the importance patients place on reflux control versus the risk of dysphagia when choosing total or partial fundoplication (Slater et al., 2021).

In a randomized study comparing Nissen and Toupet during paraesophageal hernia repair, fewer obstructive complaints and greater improvement in quality of life were reported in the posterior partial fundoplication group. These results support Toupet as an option, particularly in patients for whom dysphagia risk is important; however, they do not indicate that the technique is mandatory for everyone. Fundoplication should be performed using suitable fundic tissue, without creating torsion or excessive tightness. Correct anatomical positioning is as important as the looseness of the wrap (Analatos et al., 2024).

Gastropexy helps maintain the abdominal position of the stomach. Anterior gastropexy added to a complete repair is not the same treatment as gastropexy performed as a limited procedure in a high-risk patient. In a randomized study of 240 patients, adding anterior gastropexy to minimally invasive paraesophageal hernia repair was found to reduce one-year recurrence from 36% to 15% (Petro et al., 2025).

6.3.4. Emergency Surgery and Special Patient Groups

In acute volvulus or obstruction, fluid resuscitation, correction of electrolyte disturbances, and gastric decompression take priority. A nasogastric tube should be advanced without force; if unsuccessful, endoscopic decompression may be considered in an appropriate patient. Emergency surgery is required in the presence of ischemia, perforation, peritonitis, or ongoing instability. Conversely, in selected patients whose condition improves with decompression and who show no evidence of loss of tissue viability, early planned repair by an experienced team may be feasible after stabilization. This approach does not mean leaving an acute patient untreated merely because symptoms have resolved (Wirsching et al., 2018).

Outcomes of emergency repairs may be worse than those of elective procedures; however, age, comorbidities, and initial disease severity also contribute to this difference. Ischemic gastric tissue may require resection. In a patient with cardiopulmonary instability, the extent of the procedure is limited according to physiological status; gastropexy may be an alternative to extensive antireflux reconstruction. In patients with severe obesity and documented concomitant reflux who are appropriate bariatric candidates, Roux-en-Y gastric bypass is considered an option that can provide both weight control and reflux treatment (Jassim et al., 2014).

7. Surgical Complications and Management

Because hiatal hernia repair involves mediastinal dissection, diaphragmatic repair, and manipulation of the esophagogastric junction, it has a distinct complication profile. Complications may be considered intraoperative, early, or late according to their timing (Table 1).

Table 1. Potential complications of hiatal hernia surgery

Intraoperative	Early Period	Late Period
Pneumothorax	Dysphagia	Chronic Dysphagia
Esophageal / Gastric Perforation	Gas bloat, Nausea	Mesh-related complications
Vagal Injury	Gastric Atony	Gastroparesis, dumping
Bleeding	Surgical Site Infections	Fundoplication migration
Cardiac / Aortic Injury		Recurrence

7.1. Esophageal and Gastric Perforation

Injury to the esophagus or stomach may occur during sac separation, dissection of dense adhesions, use of energy devices, or advancement of calibration instruments. When injury is recognized intraoperatively, tissue viability, the site of the defect, and contamination are assessed, followed by appropriate repair and drainage. Intraoperative endoscopy and leak testing may be helpful; a negative test does not completely exclude delayed thermal injury. Loss of anatomical planes, particularly during recurrent hernia surgery, increases the risk of injury (Botha & Di, 2021; Imai & Soukiasian, 2019; Yadlapati et al., 2018).

Unexplained postoperative tachycardia, fever, chest or epigastric pain, hypoxia, sepsis, and pleural effusion should raise concern for a leak. The patient is stabilized, oral intake is stopped, and intravenous broad-spectrum antibiotics are initiated. Contrast-enhanced thoracoabdominal computed tomography is useful for assessing leakage, mediastinal collections, and pleural contamination. Contrast esophagography and endoscopy are added if necessary. When clinical suspicion is high, a single negative examination should not terminate the diagnostic process (Chirica et al., 2019).

The aim of treatment is not only to close the defect but also to control the source of infection and contamination. In stable patients, a limited and well-drained leak may be managed with selected conservative or endoscopic approaches under close monitoring. Clips, covered stents, or endoscopic vacuum therapy are considered according to the characteristics of the defect. A free leak, widespread contamination, tissue necrosis, or instability may require surgical exploration, drainage, and, when necessary, resection. Nutritional support should be planned throughout treatment, and decisions should be made by an experienced multidisciplinary team (Chirica et al., 2019).

7.2. Bleeding and Adjacent Organ Injuries

Division of the short gastric vessels, traction on the splenic capsule, and mediastinal vascular dissection may cause bleeding. Controlled exposure, appropriate traction, and limiting the use of energy devices are preventive measures. Hemodynamic changes, a decrease in hemoglobin, and increasing abdominal distension are evaluated for postoperative bleeding. Management includes resuscitation, imaging, interventional radiology, or reoperation depending on the bleeding site, persistence of bleeding, and patient stability. In unstable patients, diagnostic procedures should not delay source control (Imai & Soukiasian, 2019; Yadlapati et al., 2018).

The anterior portion of the hiatus is close to the pericardium. Fixation devices that penetrate deeply may cause cardiac injury and tamponade. Tamponade should also be considered in unexplained hypotension, tachycardia, and circulatory collapse during or shortly after surgery. Echocardiography and immediate appropriate cardiac intervention may be required. The main preventive approach is to avoid blind and deep fixation into the thin anterior portion of the diaphragm (Yerdel et al., 2018).

7.3. Pneumothorax

Opening of the pleura during mediastinal dissection may allow pneumoperitoneum gas to enter the thorax and cause capnothorax. Because carbon dioxide is absorbed rapidly, not every case requires a chest tube. When airway pressure increases or hypoxia and hypotension occur, the surgical and anesthesia teams should assess the situation together. Reducing or temporarily stopping insufflation pressure and making appropriate ventilation adjustments may be sufficient. Persistent ventilation impairment, hemodynamic instability, or tension physiology requires emergency decompression and drainage (Phillips & Falk, 2011).

Postoperative dyspnea should not be attributed solely to pleural opening. Atelectasis, pneumonia, aspiration, pulmonary embolism, heart failure, and leak-related pleural infection are included in the differential diagnosis. Assessment is guided by timing, physical examination, oxygenation, and associated findings. Early mobilization, adequate analgesia, breathing exercises, and appropriate thromboembolism prophylaxis are components of general prevention. New-onset hypoxia and unexplained tachycardia should be investigated without delay, especially in elderly patients and those with comorbidities (Botha & Di, 2021; Clark et al., 2018).

7.4. Dysphagia and Outflow Obstruction

Mild early dysphagia may be associated with edema and adaptation to the new anatomy of the junction. If the patient can tolerate liquids and symptoms gradually decrease, observation with small bites, thorough chewing, and gradual dietary advancement is possible. Inability to swallow even liquids, repeated vomiting, aspiration, marked weight loss, or progressively worsening dysphagia should not be regarded as expected recovery. Excessively tight crural closure, a narrow or long fundoplication, torsion, wrap migration, and early reherniation should be investigated (Yadlapati et al., 2018).

Initial evaluation of persistent or severe dysphagia is generally performed with endoscopy and contrast esophagography. If the anatomy appears satisfactory, manometry provides additional information about functional obstruction and motility. Endoscopic dilation may be beneficial in suitable anatomy; however, repeated dilation does not resolve severe torsion or migration. When revision is necessary, crural narrowing and wrap configuration are assessed together. The surgical decision should be based on concordance between symptom severity and objective pathology (Kohn et al., 2024).

7.5. Gas Bloating and Gastric Emptying Disorders

After fundoplication, difficulty belching, abdominal bloating, early satiety, and increased flatulence may constitute gas-bloat syndrome. Reducing meal sizes, eating slowly, and decreasing aerophagia and carbonated drinks are initial measures. If symptoms are severe, mechanical obstruction and delayed gastric emptying are investigated. It is incorrect to attribute

every complaint of bloating to an excessively tight fundoplication; bowel function, eating behavior, and preoperative complaints should also be assessed (Yadlapati et al., 2018).

Gastric emptying may be delayed after vagal injury or extensive dissection. If persistent nausea, vomiting, and early satiety are present, mechanical causes are excluded first; a standardized gastric emptying study may then be considered. Dietary modification and appropriate medical treatment are initial options; pylorus-directed interventions are evaluated in specialist centers for refractory patients (Tog et al., 2017).

7.6. Mesh-Related Complications

Mesh erosion, migration, and severe fibrotic narrowing may emerge months or years after surgery. Dysphagia, odynophagia, bleeding, pain, weight loss, and recurrent infection are warning signs. Endoscopy may demonstrate migration of the material into the lumen; tomography and contrast studies further delineate its relationship to surrounding tissues. Although systematic reviews report that these complications are uncommon, rates based on case reports do not reliably measure the true risk in the population (Spiro et al., 2020).

Treatment depends on the extent to which the mesh has entered the lumen and how deeply it is embedded in the surrounding tissues. Completely intraluminal material that is appropriately selected may be removed endoscopically. Uncontrolled traction on material embedded in the wall may cause perforation. Severe erosion, fistula, or stenosis may require mesh removal, reconstruction of the junction, and, rarely, esophageal or gastric resection. These patients should be evaluated at experienced upper gastrointestinal surgical centers (Spiro et al., 2020).

7.7. Recurrence and Recurrent Reflux

Radiological recurrence, symptomatic recurrence, and the need for reoperation are distinct outcomes. Although anatomical recurrence is common in long-term randomized studies, a substantial proportion of patients may maintain clinical benefit. Therefore, a small, asymptomatic radiological recurrence alone is not an indication for reoperation. More detailed evaluation is required in cases of persistent dysphagia, obstruction, volvulus, proven treatment-resistant reflux, or significant loss of quality of life (Analatos et al., 2024; Oelschlager et al., 2011; Petro et al., 2025).

In evaluating recurrence, the nature of the symptoms is determined first. Endoscopy and esophagography are used to examine wrap position, the hiatal defect, and gastric emptying; tomography, manometry, and reflux monitoring are added when necessary. Recurrence of reflux symptoms does not always indicate anatomical recurrence; likewise, anatomical recurrence does not always produce pathological reflux. The previous operative report, mesh used, and history of complications are important components of revision planning (Chirica et al., 2019).

During revision, adhesions, altered tissue planes, and previous implants increase the risk of perforation and vagal injury. Treatment options include repeat crural repair, correction or revision of fundoplication, esophageal lengthening when necessary, and Roux-en-Y

reconstruction in selected patients. Repeated failures, severe motility disorders, or concomitant obesity may prompt consideration of alternative reconstructions. The expected benefit of revision should not be assumed to be the same as that of the initial operation; the risks of a more complex intervention should be clearly discussed (Daly et al., 2024; Singhal et al., 2018).

7.8. Postoperative Follow-up

During the first days, oral intake, hydration, pain, nausea, and respiratory status are assessed. The diet is advanced from liquids to soft foods according to the procedure performed and the patient's swallowing tolerance. Control of vomiting and severe retching is important; sudden pressure loading on the new repair may contribute to early migration. Patients are instructed to seek medical attention promptly in case of inability to tolerate liquids, severe pain, fever, bleeding, or shortness of breath. Long-term follow-up is based on assessment of symptoms and quality of life; the need for imaging is determined according to clinical findings and the center's protocol (Kohn et al., 2013; Kohn et al., 2024).

Hiatal hernia is a disease in which anatomical type and clinical consequences must be evaluated together. Objective assessment of reflux in sliding hernia and accurate identification of mechanical manifestations and the patient's physiological reserve in paraesophageal hernia guide treatment selection. Surgery aims to achieve tension-free esophageal positioning, appropriate crural closure, and a functional gastroesophageal junction. Decisions regarding mesh, fundoplication, and gastropexy should be made within the limits of the patient's anatomy and the available evidence. Successful treatment is evaluated not only by disappearance of the hernia on imaging but also by safe swallowing, symptom control, maintenance of nutrition, and improvement in quality of life.

References

Analatos, A., Håkanson, B. S., Ansorge, C., Lindblad, M., Lundell, L., & Thorell, A. (2024). Hiatal hernia repair with Tension-Free mesh or crural sutures alone in antireflux surgery: A 13-Year Follow-Up of a randomized clinical trial. *JAMA Surgery, 159*(1), 11-18. https://doi.org/10.1001/jamasurg.2023.4976

Apaydin, N., Uz, A., Evirgen, O., Loukas, M., Tubbs, R. S., & Elhan, A. (2008). The phrenico-esophageal ligament: An anatomical study. *Surgical and Radiologic Anatomy, 30*(1), 29-36. https://doi.org/10.1007/s00276-007-0279-0

Bhargava, A. & Andrade, R. (2020). Giant paraesophageal hernia: What do we really know? *JTCVS Techniques, 3*, 367-372. https://doi.org/10.1016/j.xjtc.2020.08.021

Botha, A. J. & Di Maggio, F. (2021). Management of complications after paraesophageal hernia repair. *Annals of Laparoscopic and Endoscopic Surgery, 6*, 38. https://doi.org/10.21037/ales-19-241

Chimukangara, M., Frelich, M. J., Bosler, M. E., Rein, L. E., Szabo, A., & Gould, J. C. (2016). The impact of frailty on outcomes of paraesophageal hernia repair. *Journal of Surgical Research, 202*(2), 259–266. https://doi.org/10.1016/j.jss.2016.02.042

Chirica, M., Kelly, M. D., Siboni, S., Aiolfi, A., Riva, C. G., Asti, E., et al. (2019). Esophageal emergencies: WSES guidelines. *World Journal of Emergency Surgery, 14*, 26. https://doi.org/10.1186/s13017-019-0245-2

Clark, L. N., Helm, M. C., Higgins, R., Lak, K., Kastenmeier, A., Kindel, T., et al. (2018). The impact of preoperative anemia and malnutrition on outcomes in paraesophageal hernia repair. *Surgical Endoscopy, 32*(11), 4666-4672. https://doi.org/10.1007/s00464-018-6311-0

Curci, J. A., Melman, L. M., Thompson, R. W., Soper, N. J., & Matthews, B. D. (2008). Elastic fiber depletion in the supporting ligaments of the gastroesophageal junction: A structural basis for the development of hiatal hernia. *Journal of the American College of Surgeons, 207*(2), 191-6. https://doi.org/10.1016/j.jamcollsurg.2008.02.036

Daly, S., Kumar, S. S., Collings, A. T., Hanna, N. M., Pandya, Y. K., Kurtz, J., et al. (2024). SAGES guidelines for the surgical treatment of hiatal hernias. *Surgical Endoscopy, 38*(9), 4765-4775. https://doi.org/10.1007/s00464-024-11092-3

Dean, C., Etienne, D., Carpentier, B., Gielecki, J., Tubbs, R. S., & Loukas, M. (2012). Hiatal hernias. *Surgical and Radiologic Anatomy, 34*(4), 291-299. https://doi.org/10.1007/s00276-011-0904-9

Dreifuss, N. H., Schlottmann, F., & Molena, D. (2020). Management of paraesophageal hernia review of clinical studies: Timing to surgery, mesh use, fundoplication, gastropexy and other controversies. *Diseases of the Esophagus, 33*(8), doaa045. https://doi.org/10.1093/dote/doaa045

Gray, D. M., Kushnir, V., Kalra, G., Rosenstock, A., Alsakka, M. A., Patel, A., et al. (2015). Cameron lesions in patients with hiatal hernias: Prevalence, presentation, and treatment outcome. *Diseases of the Esophagus, 28*(5), 448-52. https://doi.org/10.1111/dote.12223

Hutter, M. M., & Rattner, D. W. (2007). Paraesophageal and other complex diaphragmatic hernias. In C. J. Yeo (Ed.), *Shackelford's surgery of the alimentary tract* (pp. 549–562). Saunders Elsevier.

Hyun, J. J. & Bak, Y. T. (2011). Clinical significance of hiatal hernia. *Gut and Liver, 5*(3), 267-277. https://doi.org/10.5009/gnl.2011.5.3.267

Imai, T. A., & Soukiasian, H. J. (2019). Management of complications in paraesophageal hernia repair. *Thoracic Surgery Clinics, 29*(4), 351–358. https://doi.org/10.1016/j.thorsurg.2019.07.009

Jassim, H., Seligman, J. T., Frelich, M., et al. (2014). A population-based analysis of emergent versus elective paraesophageal hernia repair using the nationwide inpatient sample. *Surgical Endoscopy, 28*(12), 3473–3478.

Kahrilas, P. J., Kim, H. C., & Pandolfino, J. E. (2008). Approaches to the diagnosis and grading of hiatal hernia. *Best Practice & Research Clinical Gastroenterology, 22*(4), 601-16. https://doi.org/10.1016/j.bpg.2007.12.007

Katz, P. O., Dunbar, K. B., Schnoll-Sussman, F. H., Greer, K. B., Yadlapati, R., & Spechler, S. J. (2022). ACG clinical guideline for the diagnosis and management of gastroesophageal reflux disease. *The American Journal of Gastroenterology, 117*(1), 27-56. https://doi.org/10.14309/ajg.0000000000001538

Kim, J., Hiura, G. T., Oelsner, E. C., Yin, X., Barr, R. G., Smith, B. M., et al. (2021). Hiatal hernia prevalence and natural history on non-contrast CT in the Multi-Ethnic study of atherosclerosis (MESA). *BMJ Open Gastroenterology, 8*(1), e000565. https://doi.org/10.1136/bmjgast-2020-000565

Kohn, G. P., Hassan, C., Lin, E., Wong, Y. I., Morozov, S., Mittal, S., et al. (2024). International society for diseases of the esophagus consensus on management of the failed fundoplication. *Diseases of the Esophagus, 37*(12), doae090. https://doi.org/10.1093/dote/doae090

Kohn, G. P., Price, R. R., DeMeester, S. R., Zehetner, J., Muensterer, O. J., Awad, Z., et al. (2013). Guidelines for the management of hiatal hernia. *Surgical Endoscopy, 27*(12), 4409-28. https://doi.org/10.1007/s00464-013-3173-3

Li, Y., Zhou, T., Chen, S., Yuan, Z., Liu, F., Gan, W., Peng, S., & Zeng, B. (2025). Laparoscopic functional fundoplication: A seven-step anti-reflux technique guided by membrane anatomy landmarks. *Gastroenterology Report, 13*, goaf094. https://doi.org/10.1093/gastro/goaf094

Markar, S. R., Menon, N., Guidozzi, N., et al. (2023). EAES multidisciplinary rapid guideline: Systematic review, meta-analysis, GRADE assessment and evidence-informed recommendations on the surgical management of paraesophageal hernias. *Surgical Endoscopy, 37*(12), 9013–9029. https://doi.org/10.1007/s00464-023-10511-1

Menon, S. & Trudgill, N. (2011). Risk factors in the aetiology of hiatus hernia: A meta-analysis. *European Journal of Gastroenterology & Hepatology, 23*(2), 133-8. https://doi.org/10.1097/MEG.0b013e3283426f57

Myers, D., Jacobson, X., Dale, M., Sahasranaman, V., & Nandipati, K. (2021). Impact of paraesophageal hernia repair on respiratory function: A systematic review. *Frontiers in Surgery, 8*, 666686. https://doi.org/10.3389/fsurg.2021.666686

Nason, K. S., Luketich, J. D., Awais, O., Abbas, G., Pennathur, A., Landreneau, R. J., et al. (2011). Quality of life after collis gastroplasty for short esophagus in patients with paraesophageal hernia. *The Annals of Thoracic Surgery, 92*(5), 1854-60. https://doi.org/10.1016/j.athoracsur.2011.06.030

Oelschlager, B. K., Pellegrini, C. A., Hunter, J. G., Brunt, M. L., Soper, N. J., Sheppard, B. C., et al. (2011). Biologic prosthesis to prevent recurrence after laparoscopic paraesophageal hernia repair: Long-term follow-up from a multicenter, prospective, randomized trial. *Journal of the American College of Surgeons, 213*(4), 461-8. https://doi.org/10.1016/j.jamcollsurg.2011.05.017

Pauwels, A., Boecxstaens, V., Andrews, C. N., Attwood, S. E., Berrisford, R., Bisschops, R., et al. (2019). How to select patients for antireflux surgery? the ICARUS guidelines (international consensus regarding preoperative examinations and clinical characteristics assessment to select adult patients for antireflux surgery). *Gut, 68*(11), 1928-1941. https://doi.org/10.1136/gutjnl-2019-318260

Petric, J., Bright, T., Liu, D. S., Wee Yun, M., & Watson, D. I. (2022). Sutured versus mesh-augmented hiatus hernia repair: A systematic review and meta-analysis of randomized controlled trials. *Annals of Surgery, 275*(1), e45-e51. https://doi.org/10.1097/SLA.0000000000004902

Petro, C. C., Ellis, R. C., Maskal, S. M., Zolin, S. J., Tu, C., Costanzo, A., et al. (2025). Anterior gastropexy for paraesophageal hernia repair: A randomized clinical trial. *JAMA Surgery, 160*(3), 247-255. https://doi.org/10.1001/jamasurg.2024.5788

Phillips, S. & Falk, G. L. (2011). Surgical tension pneumothorax during laparoscopic repair of massive hiatus hernia: A different situation requiring different management. *Anaesthesia and Intensive Care, 39*(6), 1120-3. https://doi.org/10.1177/0310057X1103900621

Roman, S. & Kahrilas, P. J. (2014). The diagnosis and management of hiatus hernia. *BMJ, 349*, g6154. https://doi.org/10.1136/bmj.g6154

Sfara, A. & Dumitrascu, D. L. (2019). The management of hiatal hernia: An update on diagnosis and treatment. *Medicine and Pharmacy Reports, 92*(4), 321-325. https://doi.org/10.15386/mpr-1323

Siegal, S. R., Dolan, J. P., & Hunter, J. G. (2017). Modern diagnosis and treatment of hiatal hernias. *Langenbeck's Archives of Surgery, 402*(8), 1145-1151. https://doi.org/10.1007/s00423-017-1606-5

Singhal, S., Kirkpatrick, D. R., Masuda, T., Gerhardt, J., & Mittal, S. K. (2018). Primary and redo antireflux surgery: Outcomes and lessons learned. *Journal of Gastrointestinal Surgery, 22*(2), 177-186. https://doi.org/10.1007/s11605-017-3480-4

Slater, B. J., Dirks, R. C., McKinley, S. K., Ansari, M. T., Kohn, G. P., Thosani, N., et al. (2021). SAGES guidelines for the surgical treatment of gastroesophageal reflux (GERD). *Surgical Endoscopy, 35*(9), 4903-4917. https://doi.org/10.1007/s00464-021-08625-5

Spiro, C., Quarmby, N., & Gananadha, S. (2020). Mesh-related complications in paraoesophageal repair: A systematic review. *Surgical Endoscopy, 34*(10), 4257-4280. https://doi.org/10.1007/s00464-020-07723-0

Stylopoulos, N., Gazelle, G. S., & Rattner, D. W. (2002). Paraesophageal hernias: Operation or observation? *Annals of Surgery, 236*(4), 492–500. https://doi.org/10.1097/00000658-200210000-00012

Tog, C., Liu, D. S., Lim, H. K., Stiven, P., Thompson, S. K., Watson, D. I., et al. (2017). Risk factors for delayed gastric emptying following laparoscopic repair of very large hiatus hernias. *BJS Open, 1*(3), 75-83. https://doi.org/10.1002/bjs5.11

Tolone, S., Savarino, E., Zaninotto, G., Gyawali, C. P., Frazzoni, M., de Bortoli, N., et al. (2018). High-resolution manometry is superior to endoscopy and radiology in assessing and grading sliding hiatal hernia: A comparison with surgical in vivo evaluation. *United European Gastroenterology Journal, 6*(7), 981–989. https://doi.org/10.1177/2050640618769160

Trudgill, N. J., Sifrim, D., Sweis, R., Fullard, M., Basu, K., McCord, M., et al. (2019). British society of gastroenterology guidelines for oesophageal manometry and oesophageal reflux monitoring. *Gut, 68*(10), 1731-1750. https://doi.org/10.1136/gutjnl-2018-318115

Watson, D. I., Thompson, S. K., Devitt, P. G., Aly, A., Irvine, T., Woods, S. D., et al. (2020). Five year Follow-up of a randomized controlled trial of laparoscopic repair of very large hiatus hernia with sutures versus absorbable versus nonabsorbable mesh. *Annals of Surgery, 272*(2), 241-247. https://doi.org/10.1097/SLA.0000000000003734

Wirsching, A., El Lakis, M. A., Mohiuddin, K., Pozzi, A., Hubka, M., & Low, D. E. (2018). Acute vs. elective paraesophageal hernia repair: Endoscopic gastric decompression allows Semi-Elective surgery in a majority of acute patients. *Journal of Gastrointestinal Surgery, 22*(2), 194-202. https://doi.org/10.1007/s11605-017-3495-x

Yadlapati, R., Hungness, E. S., & Pandolfino, J. E. (2018). Complications of antireflux surgery. *The American Journal of Gastroenterology, 113*(8), 1137-1147. https://doi.org/10.1038/s41395-018-0115-7

Yerdel, M. A., Şen, O., Zor, U., Kara, S., & Acunaş, B. (2018). Cardiac tamponade as a Life-Threatening complication of laparoscopic antireflux surgery: The real incidence and 3D anatomy of a heart injury by helical tacks. *Journal of Laparoendoscopic & Advanced Surgical Techniques, 28*(9), 1041-1046. https://doi.org/10.1089/lap.2017.0713

BÖLÜM 3

THE ROLE OF PATIENT MONITORING AND DIGITAL TECHNOLOGIES IN BARIATRIC SURGERY PROCEDURES

ABDULLAH ÇİME[1]

Introduction

In recent years, bariatric surgery has become increasingly common due to the rising incidence and prevalence of obesity; it is now a significant surgical treatment option that attracts not only domestic patients but also those involved in international medical tourism. As the prevalence of obesity within society grows driven by factors such as increasingly sedentary urban lifestyles, reduced physical activity, and poor dietary habits a range of direct and indirect health complications has emerged. Because conventional weight-management strategies which focus on balancing caloric intake and expenditure through diet and physical activity require a long-term commitment, bariatric surgery serves as a vital alternative for cases of obesity that necessitate immediate or acute intervention.

[1] Dr, Kırıkkale Private Yaşam Hospital, General Surgery, Orcid: 0009-0006-2518-6085

Although it is possible to reach a target weight in a relatively short time following bariatric surgery, factors such as the re-expansion of the stomach and a mismatch between an individual's dietary intake and physical activity levels can lead to weight regain, potentially necessitating revision surgery. For this reason, post-operative patient follow-up is of great importance, as it ensures the effective management of the patient's weight, physical activity, and overall health status.

Digital applications, which are among the primary methods used for patient monitoring today, facilitate significant interaction and communication between patients and healthcare professionals in a short amount of time, while also enabling the collection, tracking, and scientific evaluation of patient data. In this regard, the effectiveness of digital technologies not only within the healthcare system as a whole but specifically in the post-operative monitoring of bariatric surgery patients is an important topic that warrants attention. Such an approach can contribute to the existing literature on the use of digital technologies in healthcare while simultaneously enhancing the success of clinical and surgical practices. Consequently, this chapter provides a conceptual and theoretical examination of the role of digital technologies in the post-operative monitoring of bariatric surgery patients.

Weight Control in Bariatric Surgery

Bariatric surgery consists of surgical procedures performed on patients who suffer from obesity a condition that cannot be resolved through medical treatment, diet, or nutritional interventions and for whom weight loss is essential, either as an urgent medical necessity or to treat specific comorbidities (Poirier et al, 2011; Runkel et al, 2011). Although the urgent need for weight loss was initially the primary criterion for bariatric surgery,

it has evolved particularly within the context of medical tourism into a field where elective surgical interventions have become more prominent.

The fundamental principle behind bariatric surgical procedures is to reduce the volume of the stomach, thereby limiting food intake and, consequently, caloric consumption (Al-Najim et al, 2018; Ionut et al, 2013; Miras and Roux, 2013). However, this approach does not offer a permanent solution; irregularities in a patient's eating habits or physical activity levels later in life can lead to a situation where further bariatric intervention may once again become necessary (Maxim et al, 2025; Ziegler et al, 2009; Natvik et al, 2013). In other words, unlike many other types of essential or elective surgeries, bariatric procedures are contingent upon specific terms and conditions foremost among these being a commitment to lifestyle changes and the adoption of a conscious, mindful approach to nutrition.

When a patient requires bariatric surgery to lose weight due to obesity in the absence of hormonal or physiological causes the situation is most often linked to the patient's lifestyle (Sagner et al, 2017; Tabish, 2017; Rozanski et al, 1999). This indicates that the patient has been unable to establish an adequate balance between caloric intake (through nutrition) and caloric expenditure. In other words, for individuals who require bariatric surgery to lose weight without an underlying medical justification, it is possible to say that their existing lifestyle patterns may also predispose them to weight gain following the surgical procedure.

The level of nutritional awareness in patients is an increasingly important topic today; even if individuals do not consume an excessive amount of food, they may still face obesity issues due to the consumption of unhealthy food items. In such cases, although individuals often believe they are eating an adequate amount and are not prone to overeating, they are more

likely to gain weight as a result of the unhealthy foods they consume.

In conclusion, one's lifestyle and daily physical activity levels, as well as an individual's knowledge regarding healthy nutrition and their ability to incorporate such habits into their daily life, are critical factors that must be addressed for effective weight management following bariatric surgery. Failure to improve an unhealthy or inadequate lifestyle and poor nutritional habits will not only hinder the desired outcomes in post-bariatric weight control and follow-up, but may also lead individuals to become less vigilant against the very factors such as irregular habits that contribute to obesity. For this reason, weight management and long-term follow-up after bariatric surgery are of paramount importance.

Patient Follow-up in Bariatric Surgery

In bariatric surgery, patient follow-up is of vital importance for the success of the surgical procedure; as we mentioned in the previous section, such follow-up is also crucial for maintaining all the gains achieved post-operation (Budny et al, 2024; O'Kane et al, 2016; Puzziferri et al, 2014). Consequently, coordination between the patient and the surgical team is considered a matter of utmost importance.

The primary objective of patient follow-up is to effectively guide the patient through appropriate medical interventions and the post-operative recovery process, while simultaneously facilitating their transition toward a sustainable, healthy lifestyle (Rajala et al, 2025; Santana et al, 2018). To this end, the focus is placed on the patterns of caloric intake and expenditure—factors known to be closely linked to weight management. Caloric intake relates to

nutrition, whereas caloric expenditure is associated with basal metabolic rate and physical activity.

Caloric intake and nutrition have become highly significant issues today, particularly with the emergence of artificial or synthetic food additives (Erickson et al, 2025; Warner, 2024; Carocho et al, 2014). As the production and marketing of these substances have grown, the consumption of unhealthy food items containing them has increased globally. Foods with a very high glycemic index, in particular, trigger a constant urge to eat, leading individuals to consume far more calories than they require daily. This persistent appetite and tendency to eat not only expand the stomach's capacity but also cause weight gain. The alarming rise in the prevalence of diabetes and metabolic disorders at a societal level can also be attributed to this factor. Consequently, in the post-operative care of bariatric surgery patients, it is essential not only to manage their nutritional routines, portion sizes, and eating patterns but also to ensure they are thoroughly educated about the nature and composition of the food they consume.

For a patient to lose weight, they must regulate their daily physical activities and the number of calories they expend. A significant challenge in this regard stems from urbanization and the expansion of communication and transportation infrastructure. Particularly in urban areas, the advancement of technology and improved transportation options have led to a more sedentary lifestyle with reduced physical movement. Consequently, individuals are unable to burn off the calories consumed through their diet, which results in weight gain. It may not always be feasible for individuals to visit a gym for intensive workouts; however, patients should be guided and monitored regarding their post-operative physical activity by incorporating simple habits into their daily routines such as using the stairs or walking for short distances.

In conclusion, the follow-up of patients after bariatric surgery is extremely important; it constitutes a vital part of the treatment, ensuring that the surgical interventions achieve their intended outcomes and that these results remain lasting. For this reason, patients must be closely monitored following bariatric surgery, particularly regarding their physical activity and nutritional routines.

Digital Methods for Patient Follow-up in Bariatric Surgery

While patient follow-up after bariatric surgery was traditionally conducted through conventional communication methods such as phone calls or in-person clinic visits a wide range of alternative options, including social media applications, are now being utilized. These digital tools encompass both general-purpose social media platforms which are accessible to the public and professional applications developed specifically for patient monitoring, the latter of which are becoming increasingly common. Such tools can generally be categorized into two groups: social media-based platforms and specialized, purpose-built applications.

Patient monitoring via social media is based on establishing communication between healthcare professionals and patients through widely used social media platforms. However, the use of these tools is influenced and shaped by various factors, ranging from a patient's level of technological literacy to their specific skills in navigating social media. Furthermore, because these platforms lack standardized protocols and are generally designed to cater to the needs of the broader population, communication between patients and healthcare teams can sometimes become problematic. While attempts have been made to address this such as by creating specific groups or employing alternative methods within these platforms such approaches can occasionally prove

insufficient. Consequently, and in response to this need, dedicated patient monitoring programs have been developed.

Patient monitoring programs generally refer to systems developed specifically for a particular disease group or health condition. Although they may utilize social media infrastructure as a communication foundation, these programs are purpose-built to address the specific communication needs between patients and their healthcare teams. Consequently, compared to standard social media platforms, these programs enable more effective monitoring processes both by facilitating faster responses to patient needs and by employing closed-system architectures that ensure the protection of patient data and personal information.

In summary, when digital technologies are considered in a broad sense, they play a significant role in helping my patients manage their daily lives and make positive adjustments to their lifestyles following bariatric surgery. However, although there are new applications emerging in this field, the technology is still in its early stages, and it cannot yet be said that it fully addresses all needs, particularly in terms of its current market scope.

Conclusion

Although bariatric surgery procedures enable patients to reach their desired weight in a short period, a failure to change lifestyle habits such as those related to nutrition and physical activity or the persistence of a sedentary lifestyle and the continued consumption of unhealthy or fast foods (often linked to obesity) can lead to the recurrence of obesity or weight-related issues. Furthermore, the sense of confidence gained from the removal of a large portion of the stomach during surgery may cause patients to lose control over their diet and nutritional intake. For this reason,

patient follow-up after bariatric surgery especially during the first year is of vital importance.

The relationship between nutrition, physical activity, and an individual's daily routine is highly complex; consequently, a personalized monitoring schedule is created for each patient based on their specific daily habits. Although patients are provided with information regarding the post-operative period, the multifaceted nature of weight management necessitates individualized follow-up. While the use of digital technologies for patient monitoring initially began via social media, today, more comprehensive, specialized programs often supported by artificial intelligence are employed. Although the primary objective of these programs is to facilitate real-time communication and interaction between the healthcare team and the patient, their relatively recent development introduces certain risks, such as concerns regarding data security and the potential for providing patients with inaccurate information. Furthermore, while some optional features are currently emerging within these applications, there remains a clear need for the development of more comprehensive and robust programs capable of addressing all patient requirements.

Communication and interaction between patients and healthcare teams facilitated through social media or dedicated applications play a crucial role in both maintaining the outcomes achieved following bariatric surgery and reducing the future need for revision surgeries. As individuals transition toward a healthier lifestyle and adopt more informed nutritional patterns, the benefits extend beyond obesity itself, positively impacting the healthcare system by addressing the full spectrum of obesity-related health issues and comorbidities. Consequently, the development and implementation of digital methods for post-bariatric patient follow-up should not be viewed merely as an optional tool or a niche sub-field; rather, it is a matter with significant public health

implications. Therefore, the development and ongoing, needs-based refinement of such applications require expertise across a diverse range of disciplines from surgery and dietetics to digital and health literacy.

Given the importance of digital technologies developed for weight management and patient monitoring following bariatric surgery, further research and literature-based applications can be pursued. Specifically, studies could examine variables such as patient and healthcare team access to these programs, levels of usage, the ability to interpret program-generated data, and the processes involved in adapting to and becoming oriented with these systems. By expanding the development of such applications and integrating them into national healthcare systems, it becomes possible to monitor and sustain the outcomes and benefits achieved through bariatric surgery with a particular focus on data tracking.

References

Al-Najim, W., Docherty, N. G., & le Roux, C. W. (2018). Food intake and eating behavior after bariatric surgery. *Physiological reviews*.

Budny, A., Janczy, A., Szymanski, M., & Mika, A. (2024). Long-term follow-up after bariatric surgery: key to successful outcomes in obesity management. *Nutrients*, *16*(24), 4399.

Carocho, M., Barreiro, M. F., Morales, P., & Ferreira, I. C. (2014). Adding molecules to food, pros and cons: A review on synthetic and natural food additives. *Comprehensive reviews in food science and food safety*, *13*(4), 377-399.

Erickson, A., Bellampalli, S., & Beyder, A. (2025). Edible evolution: the significance of food additives in shaping human health. *Frontiers in Nutrition*, *12*, 1717352.

Ionut, V., Burch, M., Youdim, A., & Bergman, R. N. (2013). Gastrointestinal hormones and bariatric surgery-induced weight loss. *Obesity*, *21*(6), 1093-1103.

Maxim, M., Soroceanu, R. P., Vlăsceanu, V. I., Platon, R. L., Toader, M., Miler, A. A., ... & Timofte, D. V. (2025). Dietary habits, obesity, and bariatric surgery: a review of impact and interventions. *Nutrients*, *17*(3), 474.

Miras, A. D., & Le Roux, C. W. (2013). Mechanisms underlying weight loss after bariatric surgery. *Nature reviews Gastroenterology & hepatology*, *10*(10), 575-584.

Natvik, E., Gjengedal, E., & Råheim, M. (2013). Totally changed, yet still the same: patients' lived experiences 5 years beyond bariatric surgery. *Qualitative health research*, *23*(9), 1202-1214.

O'Kane, M., Parretti, H. M., Hughes, C. A., Sharma, M., Woodcock, S., Puplampu, T., ... & Barth, J. H. (2016). Guidelines for the follow-up of patients undergoing bariatric surgery. *Clinical obesity*, *6*(3), 210-224.

Poirier, P., Cornier, M. A., Mazzone, T., Stiles, S., Cummings, S., Klein, S., ... & Franklin, B. A. (2011). Bariatric surgery and cardiovascular risk factors: a scientific statement from the American Heart Association. *Circulation*, *123*(15), 1683-1701.

Puzziferri, N., Roshek III, T. B., Mayo, H. G., Gallagher, R., Belle, S. H., & Livingston, E. H. (2014). Long-term follow-up after bariatric surgery: a systematic review. *Jama*, *312*(9), 934-942.

Rajala, M., Kääriäinen, M., Tanhua, A., & Kaakinen, P. (2025). Patients' Perspectives on Postoperative Follow-Up Calls in Day Surgery: A Qualitative Study. *Scandinavian Journal of Caring Sciences*, *39*(3), e70077.

Rozanski, A., Blumenthal, J. A., & Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation*, *99*(16), 2192-2217.

Runkel, N., Colombo-Benkmann, M., Hüttl, T. P., Tigges, H., Mann, O., & Sauerland, S. (2011). Bariatric surgery. *Deutsches Ärzteblatt International*, *108*(20), 341.

Sagner, M., Egger, G., Binns, A., & Rossner, S. (Eds.). (2017). *Lifestyle medicine: lifestyle, the environment and preventive medicine in health and disease*. Academic Press.

Santana, R. F., Pereira, S. K., do Carmo, T. G., Freire, V. E. C. D. S., Soares, T. D. S., do Amaral, D. M., & Vaqueiro, R.

D. (2018). Effectiveness of a telephone follow-up nursing intervention in postsurgical patients. *International Journal of Nursing Practice*, *24*(4), e12648.

Tabish, S. A. (2017). Lifestyle diseases: consequences, characteristics, causes and control. *J Cardiol Curr Res*, *9*(3), 00326.

Warner, J. O. (2024). Artificial food additives: hazardous to long-term health?. *Archives of disease in childhood*, *109*(11), 882-885.

Ziegler, O., Sirveaux, M. A., Brunaud, L., Reibel, N., & Quilliot, D. (2009). Medical follow up after bariatric surgery: nutritional and drug issues General recommendations for the prevention and treatment of nutritional deficiencies. *Diabetes & metabolism*, *35*(6), 544-557.

BÖLÜM 4

LOKAL İLERİ EVRE MEME KANSERLERİNDE REKONSTRÜKSİYON YÖNTEMLERİ: PALYATİF YAKLAŞIMDAN YAŞAM KALİTESİNE

BÜLENT SULTANOĞLU[1]

GİRİŞ

Meme kanseri, en yaygın kanser türlerinden biridir. Kanserden ölüm nedenleri arasında ikinci sırada yer almaktadır. Son yıllarda görülme sıklığı giderek artış göstermekte ve yılda % 0,5 oranında arttığı belirtilmektedir.(Giaquinto et al., 2022)

Memedeki geniş, ülsere yaralar meme kanserinin ilerlemiş ve sıkıntı yaratan bir sonucu olarak ortaya çıkmaktadır(Osório et al., 2023). American Joint Committee on Cancer (AJCC) tarafından evre 3 olarak sınıflandırılmıştır.

1

[1] Dr. Öğr. Üyesi, Gaziantep Şehir Hastanesi, Genel Cerrahi Kliniği, Orcid: 0000-0001-7939-2366

Lokal ileri evre meme kanseri (LABC), uzak metastaz olmaksızın, yaygın lezyon invazyonu veya bölgesel lenf nodu metastazı olan, klinik evre IIB ila IIIC dahil olmak üzere geniş bir meme kanseri kategorisini ifade etmektedir (Zhu & Doğan, 2021)

Hastanın müracatının gecikmesi sonucunda ortaya çıkmaktadır. Müracaat anına kadar olan gecikmeler hastanın sosyoekonomik düzeyine, sosyal izolasyonuna, ileri yaş, psikolojik olarak durumu kabullenememe ve erkek cinsiyet kaynaklı olabilmesinden dolayı olabilir. (Lund-Nielsen et al., 2011) Lokal ileri meme kanseri, genellikle büyük tümör boyutu, cilt invazyonu ve aksiller lenf nodu tutulumu ile karakterizedir.

Bazı hastalarda meme ülserasyonu, nekroz nedeniyle sekonder enfeksiyon gibi komplikasyonlar gelişebilir. Bu durum, hastaların yaşam kalitesini ciddi şekilde etkileyen, sosyal izolasyona yol açan, ağrılı ve kötü kokulu bir klinik tabloya neden olabilmektedir. Bu hastalarda yaşam beklentisinin sınırlı olması nedeniyle tedavi, sistemik neoadjuvant kemoterapi, tümöral kitleyi küçültmek için hormonal tedavi yerine semptomları azaltan ve yaşam kalitesini arttıran palyatif cerrahi şeklinde olmaktadır. Cerrahi tedavi, yaşam kalitesini arttırmaya yönelik tedaviye entegre şekilde uygulanabilir olmalıdır.

MASTEKTOMİ

Mastektomi, uygun vakalarda basit ve kullanışlı bir yöntem olması nedeniyle ilk tercihtir. (Resim 1 ve 2) Kolay yara bakımı, hastanede kısa yatış süresi ve kolay uygulanabilir olması avantajlarıdır. Ancak, bazen mastektomi, sonrasında yetersiz doku kalması sebebiyle rekonstrüksiyon yapılması oldukça zorlaşmaktadır. Bu sebeple rekonstrüksiyon amacıyla literatürde birçok fleb yöntemi de tanımlanmıştır. Cilt flebleri, basit olmaları ve karşılaştırılabilir olmaları nedeniyle miyokutanöz fleblere tercih

edilir. (Deo et al., 2003; Leinster & Webster, 1982) Bilateral advancement mastektomi flebi, mastektomi insizyonu ile başlar. Üstte klavikula üzerinden yukarıya doğru disseksiyon genişletilirken, alttan gerekirse umblikusa kadar prefascial alanda ilerler. Burada interkostal , epigastrik damarlar ve perforan dalların korunması önemlidir. Doku kaybının çok olması, defektin kapatılmasına imkan olmayan durumlarda miyokutanöz fleblerin tercih edilir.

Resim 1



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

Resim 2



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

TORAKOABDOMİNAL FLEB

Temel olarak lateral interkostal, subkostal ve lomber arterleri kullanan bir rotasyon-ilerletme flebidir. Karın orta hattından göbek deliğine kadar bir kesi yapılır ve daha ileri diseksiyon, prefasyal bir düzlem boyunca aşağıya ve laterale doğru ilerler. Bu flebin pedikülü, dış oblik kasın medial kenarında belirlenebilir ve korunabilir. Flep, sol göğüs duvarı defektleri için saat yönünde, sağ göğüs duvarı defektleri için ise saat yönünün tersine döndürülür. Torakoabdominal fleb, torakoabdominal deri, ön karın duvarının deri altı dokusunu ve subkostal, interkostal ve lomber arterlerden kaynaklanan segmental arterlerin doğrudan perforan damarlarını kullanır.(Leinster & Webster, 1982) (Resim 3a,b,c)

Resim 3a



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

Resim 3b



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

Resim 3c



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

INVERTED T İNSİZYON İLE REKONSTRÜKSİYON(WISE PATTERN)

İnverted T insizyonu ile yapılan onkoplastik prensiplere uygun mastektomi ülsere, sınırlı alanı tutan hastalık için volüm kaybına yol açmasına rağmen uygun bir tedavi yöntemidir. Cerrahi adımlar, meme cildinde insizyon çizimi, sonrasında meme üst fleblerin hazırlanması, tümör eksizyonu, cilt stapleri ile şekil ve proporsiyonu değerlendirme, sonrasında ise yeniden şekillendirme şeklindedir. Bu adımlar boyunca, nipple areola kompleksinin doğru konumlandırılması ve vasküleritenin korunması nekroz riskini azaltır. Bu tekniğin avantajları arasında geniş tümör eksizyonu sağlanması, meme konturunun korunması ve simetrinin iyileştirilmesi yer alır. Ancak, nipple areola kompleksinin nekrozu, (sigara içenlerde, periferik damar hastalığı olanlarda ve radyoterapi görmüş hastalarda bu risk daha fazladır.) yara iyileşmesindeki

problemler ve meme asimetrisi gibi komplikasyonlar görülebilir.(GÜLÇELİK & FERAHMAN, 2026) (resim 4a,b)

Resim 4a



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

Resim 4b



Kaynak: Dr. Bülent SULTANOĞLU'nun arşivinden

TRANSVERSE RECTUS ABDOMİNİS MUSCULOCUTANEOUS FLAP (TRAM)

TRAM fleb Hartrampf ve ark. Tarafından ilk kez 1982 yılında bildirilmiştir. O tarihten bu yana mastektomi yapılan hastalarda meme rekonstrüksiyonunun vazgeçilmez yöntemi haline gelmiştir.(Hsieh et al., 2014) TRAM fleb otolog meme rekonstrüksiyonunda altın standart olarak kabul edilmektedir. TRAM fleb operasyonunda rektus abdominis kası kullanılmaktadır. Bu nedenle karın duvarı zayıflığı, ventral herni gibi komplikasyonlar görülebilmektedir. Güncel cerrahide kas koruyucu tekniklerin (DIEP fleb gibi) popülerliği nedeniyle TRAM, mikrocerrahi imkanı olmayan merkezler için halen daha uygun bir seçenektir.

SONUÇ

Ülsere olmuş, lokal ileri meme kanserli hastalarda cerrahi tedavi genellikle palyatif olarak değerlendirilse de yaşam kalitesini arttırır. Cilt flebi ile yapılan onarımlar, geniş doku kayıplarının güvenli bir şekilde kapatılmasını sağlar. Ülsere lezyonların komplikasyonlarını ve yara bakım problemlerini ortadan kaldırır. Bu yaklaşım, hem fiziksel hem de psikososyal açıdan hastalar için önemli kazanımlar sunar. Bu nedenle, cerrahi tedavinin palyatif amaçlı değil tedaviye entegre olarak öncelikli düşünülmesi önemlidir.

KAYNAKÇA

Deo, S. V. S., Purkayastha, J., Shukla, N. K., & Asthana, S. (2003). Myocutaneous versus thoraco-abdominal flap cover for soft tissue defects following surgery for locally advanced and recurrent breast cancer. *Journal of Surgical Oncology*, *83*(1), 31–35. https://doi.org/10.1002/jso.10236

Giaquinto, A. N., Sung, H., Miller, K. D., Kramer, J. L., Newman, L. A., Minihan, A., Jemal, A., & Siegel, R. L. (2022). Breast Cancer Statistics, 2022. *CA: A Cancer Journal for Clinicians*, *72*(6), 524–541. https://doi.org/10.3322/caac.21754

GÜLÇELİK, M. A., & FERAHMAN, S. (2026). ONCOPLASTIC SURGERY TECHNIQUES - WISE (INVERTED T) PATTERN. In *Essential of Oncoplastic Breast Surgery Techniques* (pp. 147–161). Turkiye Klinikleri. https://doi.org/10.5336/978-625-395-828-2_p147

Hsieh, T.-Y., Lin, Y.-N., Lin, S.-D., Lai, C.-S., Chang, K.-P., Lee, S.-S., Huang, S.-H., Hou, M.-F., Chen, F.-M., & Ou-Yang, F. (2014). Immediate Transverse Rectus Abdominis Musculocutaneous Flap Reconstruction Is Associated With Improved Cancer-Specific Survival in Locally Advanced Breast Cancer. *Annals of Plastic Surgery*, *73*(Supplement 1), S31–S36. https://doi.org/10.1097/SAP.0000000000000251

Leinster, S. J., & Webster, D. J. (1982). Thoraco-abdominal and thoracoepigastric flaps: alternatives to skin grafting after mastectomy. *Clinical Oncology*, *8*(2), 145—148. http://europepmc.org/abstract/MED/7049480

Lund-Nielsen, B., Midtgaard, J., Rørth, M., Gottrup, F., & Adamsen, L. (2011). An Avalanche of Ignoring-A Qualitative Study of Health Care Avoidance in Women With Malignant

Breast Cancer Wounds. *Cancer Nursing*, *34*(4), 277–285. https://doi.org/10.1097/NCC.0b013e3182025020

Osório, C., Rodrigues, E. F., Santos, M., Santos, T., & Nora, M. (2023). Fungating Breast Wound: A Rare Manifestation of Primary Breast Leiomyosarcoma. *Cureus*. https://doi.org/10.7759/cureus.33398

Zhu, H., & Doğan, B. E. (2021). American Joint Committee on Cancer's Staging System for Breast Cancer, Eighth Edition: Summary for Clinicians. *European Journal of Breast Health*, *17*(3), 234–238. https://doi.org/10.4274/ejbh.galenos.2021.2021-4-3


BİDGE