

Right Sided Enterothorax: A Rare Long-term Complication of Donor Hepatectomy

Sağ Enterotoraks: Donör Hepatektominin Nadir Uzun Dönem
Komplikasyonu
Genel Cerrahi

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Özet

Diyafragma fıtıkları konjenital ve edinsel olarak sınıflandırılabilir. Sağ taraflı edinsel insizyonel diyafram hernileri oldukça nadirdir. Yaklaşık 3 yıl önce donör hepatektomi öykülü bir hasta acil serviste yapılan değerlendirme sonucunda strangüle inkarsere insizyonel diyafram hernisi tanısı ile opere edildi. Öncelikli olarak küçük diyafram defektini emilmeyen sütür ile onarıldı ve sağ hemikolektomi yapıldı. Hasta postoperatif 7. günde sorunsuz taburcu edildi. Ameliyat sonrası insizyonel diyafram hernisi insidansı farklı serilerde %5-62 arasında olup, karaciğer donörlerinde ameliyat sonrası morbidite oranı %12-26'dır. Strangüle diyafram hernileri karaciğer cerrahisi geçirmiş hastalarda tanı olarak akılda tutulmalıdır. Hastaya yaklaşım klinik, görüntüleme ve hastanın durumuna göre belirlenmelidir.

Anahtar kelimeler: *diyaframatik herni, enterotoraks, donör hepatektomi, komplikasyon*

Abstract

Diaphragmatic hernias can be classified as congenital and acquired. Right-sided acquired incisional diaphragmatic hernias are extremely rare. We operated on a patient who had undergone donor hepatectomy about 3 years ago with the diagnosis of strangulated incarcerated incisional diaphragmatic hernia after evaluation in the emergency department. We primarily repaired the small diaphragmatic defect with non-absorbable suture and performed a right hemicolectomy. The patient was discharged uneventfully on the 7th postoperative day. The incidence of post-operative incisional diaphragmatic hernia is between 5-62% in different series, and the postoperative morbidity rate for liver donors is 12-26%. Strangulated diaphragmatic hernias should be kept in mind as a diagnosis in patients who have undergone liver surgery. The approach to the patient should be determined according to the clinic, imaging and the patient's condition.

Keywords: *diaphragmatic hernia, enterothorax, donor hepatectomy, complication*

Introduction

Living donor liver transplantation (LDLT) is also being performed in increasing numbers in Asian countries to abate mortality and increase the reduced cadaveric liver storage. Although it is still controversial, LDLT is considered as a treatment modality for unresectable colorectal liver metastases and HCC. In adult-adult LDLT, the right lobe of the liver without the middle hepatic vein is commonly used for the donor hepatectomy¹. Diaphragmatic hernias can be classified as congenital and acquired. Congenital hernias arise from the developmental defect of the diaphragmatic constal and crural muscles². Acquired diaphragmatic hernias are generally seen on the left side due to trauma. The anatomical localization of the liver reduces the possibility of right-sided diaphragmatic hernia³. Acquired right-sided diaphragmatic hernias which are less common may occur after penetrating injuries or surgery. Although it is more common in nephrectomy and esophagectomy, cases of iatrogenic diaphragmatic hernia have been reported after cholecystectomy, spleno-pancreatectomy and liver resections⁴. Thermal damage of the diaphragm, poor nutritional status, pressure difference between thorax and abdomen, and thin diaphragmatic structure were emphasized as risk factors for incisional diaphragmatic hernia. In this case report, we present a very rare incisional strangulated diaphragmatic hernia due to donor hepatectomy.

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Case Report

A 41-year-old male patient who had no chronic disease, no family history and had undergone donor right-hepatectomy 3 years ago was admitted to the tertiary emergency department with complaints of abdominal pain, nausea and vomiting for two days. The patient emphasized that the abdominal pain increased from the beginning and was continuous throughout the day. The patient also stated that he vomited dark colored and foul-smelling from the second day of his complaints.

Vital signs of the patient were blood pressure 110/70 mm Hg, heart rate 110 beats/minute, breathing rate 25/minute, saturation 94, fever 37.2 celcius. The patient's BMI was 37 kg/m². Increased bowel sounds on auscultation; diffuse abdominal tenderness, rebound and minimal distension were detected in the comprehensive examination performed by the Emergency Service Doctors. On rectal examination, the ampulla was found to be empty. There was no significant finding other than leukocytosis in blood tests. A mild blunting was observed in the right sinus on chest X-ray. Abdominal X-ray showed several small intestinal air-fluid levels. Computed tomography (CT) showed air-fluid level in the distal small intestine and a herniated rightcolon in the thorax (Figure 1-2).

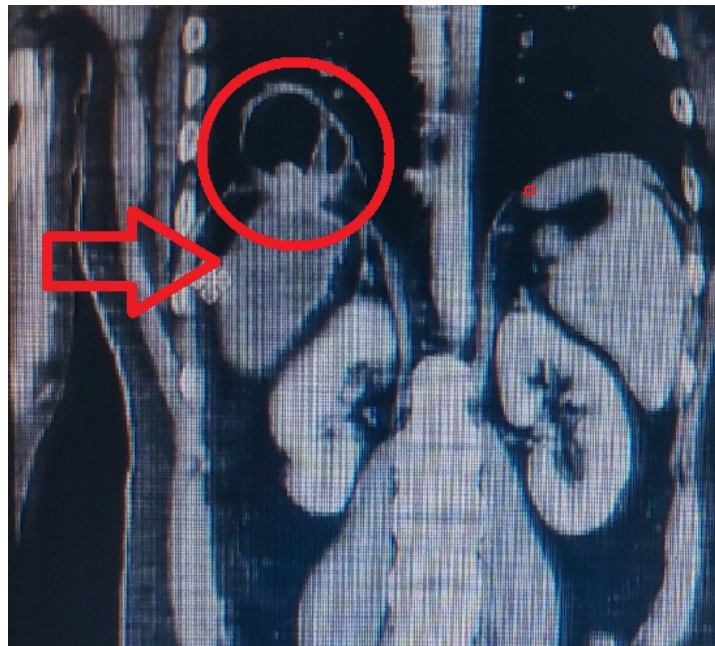


Figure 1

CT Image at Coronal section. The right colon herniated to the thorax is seen

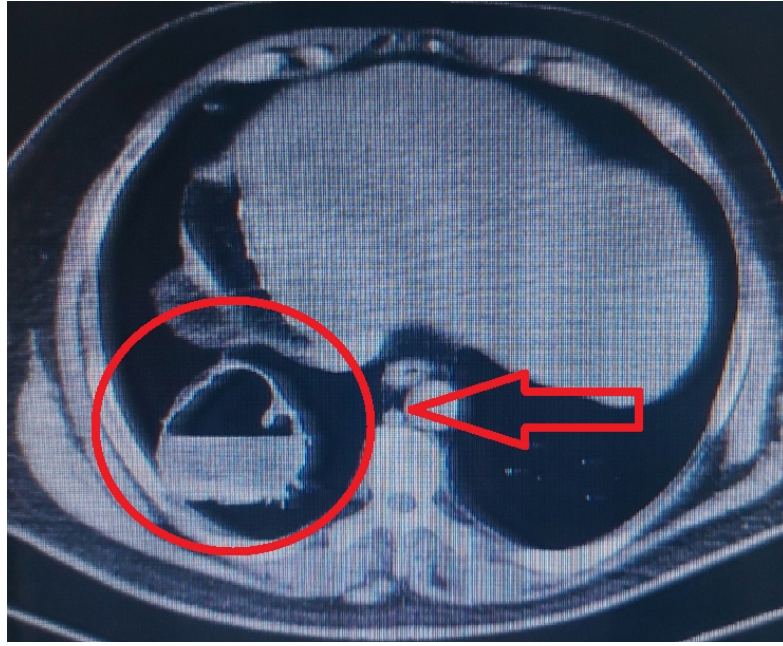


Figure 2
CT Image at Axial section

The patient who was evaluated as acute abdomen by the emergency physicians was consulted to us after the patient's anamnesis, physical examination, laboratory and radiological examinations. As a general surgery clinic, we diagnosed strangulated incarcerated incisional diaphragmatic hernia.

The patient was admitted to the hospital after obtaining consent for further examination, treatment and data to be used for academic study. We decided for emergency laparotomy because systemic inflammatory response due to strangulation of the right colon started in the patient and his hemodynamics was unstable.

It was seen that there was bleeding in the small intestine mesentery which was stretched due to the hernia and the blood supply to the cecum and ascending colon was impaired in the examination during the operation. After bleeding control is provided herniation of approximately 5 cm colon segment was detected from the 2 cm diaphragmatic defect in the case with donor right hepatectomy history. After enlarging the defect approximately 1 cm, the hernia was reduced. There was no significant adhesion with the major structures and pleura in the thorax. The diaphragmatic defect was closed transabdominally with non-absorbable sutures. Right hemicolectomy was performed, lateral anastomosis was performed with surgical staples.

The patient was followed up in the intensive care unit one day after the operation and oral intake was started on the 3rd postoperative day. The patient who was treated with meropenem and vancomycin due to bilateral lower lobe pneumonia was also followed up by the Pulmonary Diseases and Infectious Diseases Clinic. The patient was discharged uneventfully on the 7th postoperative day.

Case Discussion

Studies have reported that the morbidity rate for a healthy donor in LDLT is 12-26% with this it has been emphasized that incisional diaphragmatic hernia develops in 5-62% of cases in different series. Direct or thermal damage of the diaphragm are presented as hypothesis for diaphragmatic hernia, which is one of the morbidities⁴⁻⁵. The congenital thin structure of the posterior diaphragm and the pressure difference between the thorax and abdomen were additionally emphasized as risk factors for diaphragmatic hernia after liver surgery. It was stated that the median time for the formation of an incisional diaphragmatic hernia after the surgery was 14 months³. We diagnosed diaphragmatic hernia in our patient 3 years after liver surgery.

Symptoms for diaphragmatic hernia are non-specific. Chest pain, recurrent abdominal pain, and early feeling of fullness after eating are some of the symptoms⁶.

In the study, it was stated that there are four stages for the development of diaphragmatic hernia: 1) asymptomatic 2) minimal symptom 3) obstruction 4) Strangulation. Surgical treatment is essential in the strangulation period. If not diagnosed early it causes strangulation and severe lung disease, and the mortality rate reaches 32%⁶.

Computed tomography is the most commonly used modality for diagnosis. The radiography accuracy for diagnosis is approximately 40%. Definitive diagnosis is made on the basis of clinical examination and radiological examinations. Basically the curative treatment of strangulated diaphragmatic hernias is emergency surgery. Primary repair is sufficient for small defects in diaphragmatic hernias²⁻⁶.

In accordance with the data and experiences expressed in the literature; we diagnosed our patient who presented with strangulated incarcerated diaphragmatic hernia with CT and examination and performed an emergency operation on our patient. In the operation, we repaired the small diaphragmatic defect with primary suture.

As a result, diaphragmatic hernias should be kept in mind as long-term complications in patients who have undergone liver surgery. Early diagnosis is important for good consequences ; symptoms, signs and general condition should be taken into consideration for patient⁶⁻⁷. In addition liver surgeons should pay attention to the integrity of adjacent organs⁵.

Special Thanks

I would like to thank Prof. Dr. Marc Besselink for allowing me to write the essay when I was a observer at his clinic.

Informed Consent

From the patient

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