Right-sided Bochdalek hernia in an adult: a case report

Bir yetişkinde sağ taraf Bochdalek hernisi: Olgu sunumu

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Congenital right diaphragmatic hernia of Bochdalek rarely occurs in adults. Most of them are asymptomatic. In this article, we report a case of a 21-year-old male with right-sided Bochdalek diaphragmatic hernia who presented with abdominal pain and dyspnea. The chest radiography showed features suggestive of right-sided diaphragmatic hernia. This was confirmed on a computed tomography. The patient underwent right posterolateral thoracotomy whereby a 10 cm posterolateral diaphragmatic defect with herniation of the colon and kidney through the opening was found. During surgery the colon and right kidney were reduced into peritoneal cavity, and the diaphragmatic defect was repaired with non-absorbable sutures. The patient's recovery was uneventful. He remained well at six-month follow-up.

Key words: Computed tomography; diaphragm/diagnosis/radiography; thoracic diseases/complication/radiography/surgery.

Bochdalek doğuştan sağ diyafram hernisi yetişkinlerde nadir görülmektedir. Bunların da büyük çoğunluğu asemptomatiktir. Bu yazıda karın ağrısı ve nefes darlığı yakınmaları ile başvuran 21 yaşındaki bir erkek hastadaki sağ taraflı Bochdalek hernisi olgusu sunuldu. Olgunun göğüs grafisinde sağ taraflı diyafram hernisine işaret eden özellikler görüldü. Bu tanı bilgisayarlı tomografi ile doğrulandı. Sağ posterolateral torakotomi uygulandı ve kolon ile sağ böbreğin herniye olduğu 10 cm'lik bir posterolateral diyafragmatik defekt saptandı. Ameliyat sırasında kolon ve sağ böbrek peritoneal boşluğa indirildi ve diyafragmatik defekt emilmeyen dikişler ile onarıldı. Hastanın iyileşme sürecinde sorun yaşanmadı. Hastanın altıncı ay kontrolünde sağlıklı olduğu saptandı.

Anahtar sözcükler: Bilgisayarlı tomografi; diyafram/tanı/radyografi; göğüs hastalıkları/komplikasyon/radyografi/cerrahi.

Bochdalek first reported herniation in the posterolateral region of the diaphragm in 1848, referred to as 'Bochdalek hernia'. The hernia defect results in utero from failed closure of the pleuroperitoneal ducts, primitive communications between the pleural and abdominal cavity.[1] It is a common congenital anomaly, occurring in approximately one in 2200 to 12.500 live births, but is widely considered to be extremely rare in adults.[2] Most Bochdalek hernias present with life-threatening cardiorespiratory distress in the neonatal period, and emergency surgical repair is usually performed in infants. Right-sided Bochdalek hernias are rarer because the right pleuroperitoneal canal closes earlier and the liver buttresses the right hemidiaphragm. Rarely, right-sided Bochdalek hernias remain clinically silent until adulthood. A Medline search of the literature revealed only 14 cases of right-sided Bochdalek's hernia in adults.[3] We report a 21-year-old male with Bochdalek hernia. The right kidney and colon were the herniated organs.

CASE REPORT

A 21-year-old previously healthy male patient was admitted to the emergency department with periumbilical pain and right-sided lower chest discomfort associated with shortness of breath of two weeks duration. There was no history of thoracic or abdominal trauma. Physical examination revealed stable vital signs. The bowel sounds were audible on the right side of the chest. Posteroanterior and lateral chest X-rays showed loops of the colon above the right hemidiaphragm (Fig. 1a, b). Computed tomography was performed and confirmed a right-sided Bochdalek hernia with colon loops and right kidney within the pleural cavity (Fig. 2a, b). Right thoracotomy was performed on the second hospital day. Herniation of the transverse colon and right-kidney in a hernia sac were observed at the site of the foramen of Bochdalek. The defect measured as 10x8 cm, and its borders were well defined. The lower lobe of the right lung was compressed and atelectatic. The adhesions were carefully released. The colon and right kidney

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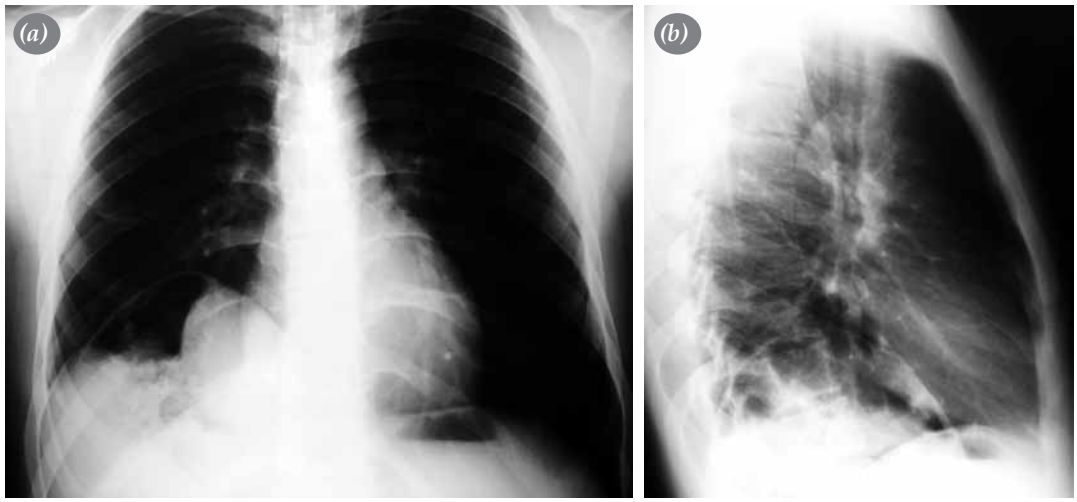

Fig. 1. (a) Posteroanterior chest graphy of the patient. **(b)** Lateral chest graphy of the patient.

were reduced to the peritoneal cavity after opening the hernia sac. There were no ischemic changes of the colon and kidney. The hernia sac was extracted and was repaired using non-absorbable sutures (Ethicon Prolene, Ethicon Inc. USA). The patient's postoperative recovery was uneventful. Chest tubes were removed on the 3rd and 4th days, and he was discharged home on the 6th post-operative day. He remains well at six-month follow-up.

DISCUSSION

The classic congenital diaphragmatic hernia of Bochdalek is a posterolateral defect in the diaphragm thought to be caused by failure of the pleuroperitoneal canal to close at eight weeks' gestation.

The right hemidiaphragm is fully formed before the left side. The defect occurs on the left side 80% of the time and is occasionally bilateral. The hole can range in size from 1- to 2-cm round defect to total absence of the hemidiaphragm. A Bochdalek hernia may cause life-threatening respiratory distress in the first hours or days of life. The defect can cause respiratory distress or feeding intolerance in later infancy or childhood or may be identified on a radiograph obtained for unrelated reasons in an asymptomatic patient. The morbidity and mortality associated with a congenital diaphragmatic hernia are directly related to the age of the patient at presentation.[4] An emergency surgical repair is usually performed in infants. Congenital right diaphragmatic hernia of Bochdalek rarely occurs in adults and it is usually asymptomatic. Usually ventilation is not compromised in Bochdalek hernia discovered during adulthood.[5] Pulmonary symptoms include chest or shoulder pain, shortness of breath, dyspnea, cough. Abdominal or back pain, changes in bowel habits, vomiting, nausea, or abdominal distension are the abdominal symptoms of

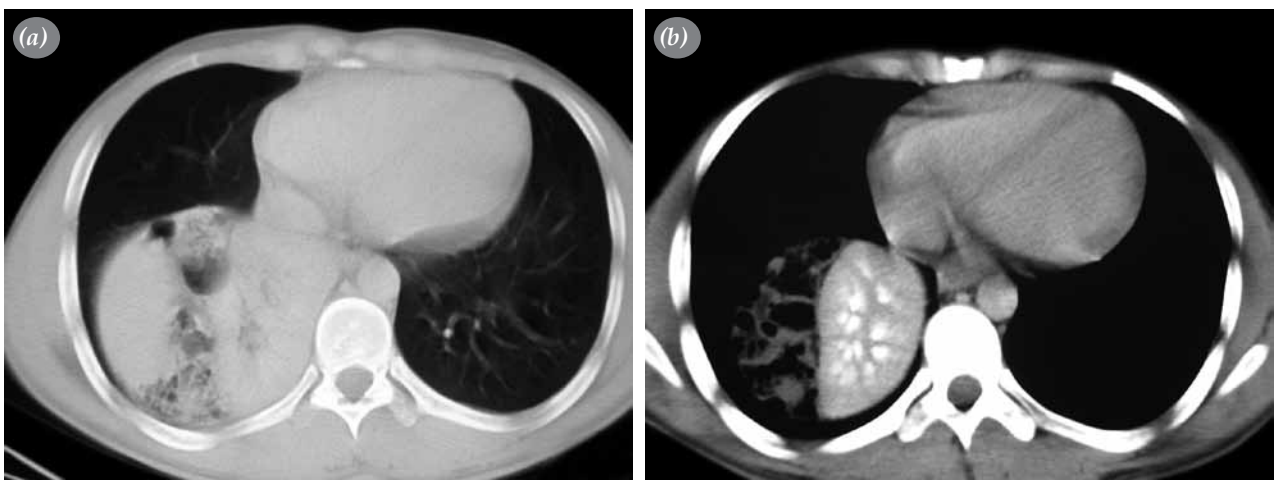

Fig. 2. Computed tomography of the patient in **(a)** paranchimal window, **(b)** mediastinal window.

Bochdalek hernia. As in the present case, the physical examination of Bochdalek hernia in adults is typically misleading. Bochdalek hernia is unexpectedly detected on chest X-rays in patients who are asymptomatic or have no specific symptoms. Chest X-ray shows gas-fluid levels in the chest and thus suggest the diagnosis of diaphragmatic hernia. Thin section CT scanning is highly accurate and should be regarded as the standard method to diagnose a Bochdalek hernia. Our present patient was admitted to the emergency department with such nonspecific symptoms as abdominal pain and dyspnea. Diagnosis is established by plain chest radiography, with definitive confirmation by computed tomography (CT) scanning of the thorax and abdomen. Because our patient did not have any prior history of trauma, we believe that the defect in the diaphragm may have been congenital, for this reason, the hernia is supposed to be Bochdalek type.

The current treatment of choice of a Bochdalek hernia is surgical repair even in asymptomatic cases because of the risk of visceral herniation and strangulation.[6] Surgical treatment encompasses both reduction of the hernia and defect closure. The open thoracic approach has traditionally been performed for right-sided Bochdalek hernias because of superior visibility of the ipsilateral hemidiaphragm and the presence of the liver. In the present case a right posterolateral thoracotomy exposed a perfect view of the diaphragmatic defect and rest of the hemidiaphragm. We transferred the colon and right kidney to the peritoneal cavity. Intrathoracic kidney associated with Bochdalek hernia differs from other intrathoracic renal ectopia, as it tends to be mobile and be easily reduced from thorax to the abdominal cavity with other organs.[7] We repaired the diaphragmatic defect using non-absorbable sutures. Extensive defects may not be repaired with sutures and/or endogenous tissues. Recent research suggests a superiority of nonabsorbable vs absorbable prosthetic materials to achieve durable repairs.[8] These prosthetic materials should be available before surgery.

In conclusion, congenital right diaphragmatic hernia of Bochdalek rarely occurs in adults. Its successful management is based on both emergency diagnosis and timely surgical management. Right sided thoracotomy is recommended as the best chance for a successful outcome, helps to obtain satisfactory results.

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