

**CASE  
REPORT**

**Latife Merve Yıldız<sup>1</sup>**  
**Mahcube Cubukcu<sup>2</sup>**

<sup>1</sup> Güneysu Tenzile Erdoğan County  
Government Hospital, Rize, Türkiye  
<sup>2</sup> Samsun University Faculty of  
Medicine, Department of Family  
Medicine, Samsun, Türkiye

**Corresponding Author:**

Latife Merve Yıldız

mail: latifeyaglioglu05@gmail.com

Received: 09.10.2023

Acceptance: 29.02.2024

DOI: 10.18521/kt.1373559

**Konuralp Medical Journal**

e-ISSN1309-3878

konuralptipdergi@duzce.edu.tr

konuralptipdergisi@gmail.com

www.konuralptipdergi.duzce.edu.tr

**Hidden Behind Chronic Dyspeptic Symptoms: Post-traumatic Diaphragmatic Eventration****ABSTRACT**

Diaphragmatic eventration is commonly seen following high-energy traumas, particularly due to traffic accidents and falls from significant heights. This pathology has the potential to influence both the gastrointestinal and cardiorespiratory systems, presenting with a variety of symptoms. A 45-year-old male patient, with a history of trauma from falling off a tree, sought medical attention at our clinic with dyspeptic complaints and symptoms of shortness of breath. During the physical examination, diminished sounds were detected in the right lung field, along with epigastric tenderness. For diagnostic purposes, a posteroanterior chest radiograph (CXR) and thoracic computed tomography (CT) scan were obtained. A subsequent bronchoscopy, performed with a pulmonology consultation, revealed decreased diaphragmatic movements. Taking into account the findings, a thoracic surgery treatment plan was devised for the patient. This case report underscores the significance of considering the seldom-encountered pathology of diaphragmatic eventration in patients presenting with dyspeptic and respiratory complaints. Keeping in mind that patients with such symptoms frequently turn to family physicians, it highlights the pivotal role of a multidisciplinary primary care approach in initiating the diagnostic trajectory.

**Keywords:** Family Medicine, Dyspepsia, Diaphragmatic Eventration.

**Kronik Dispeptik Şikayetlerin Ardında Saklı Kalmış: Travma Sonrası Diyafragma Evantrasyonu****ÖZET**

Diyafragma evantrasyonu, yüksek enerjili travmalarda, özellikle trafik kazaları ve yüksekten düşmelerde oluşmaktadır. Bu patoloji, gastrointestinal ve kardiyorespiratuar sistemleri etkileyebilmekte ve semptomları değişkenlik gösterebilmektedir. Kırk beş yaşında erkek hasta, ağaçtan düşme travma öyküsü olup, dispeptik yakınmalar ve nefes darlığı semptomlarıyla polikliniğe başvurmuştur. Fizik muayenede, sağ akciğer seslerinde azalma ve epigastrik hassasiyet saptanmıştır. Tanı için posteroanterior akciğer grafisi (PAAC) ve toraks bilgisayarlı tomografisi (BT) çekilmiştir. Göğüs hastalıkları konsültasyonu ile yapılan bronkoskopide diyafragma hareketlerinde azalma görülmüştür. Hastaya, bulgular doğrultusunda göğüs cerrahisiyle tedavi planı oluşturulmuştur. Bu olgu sunumu, dispeptik ve solunumsal şikayetleri olan hastalarda, nadir rastlanan diyafragma evantrasyonu patolojisinin göz önünde bulundurulmasının önemini vurgulamaktadır. Bu tarz yakınmalarla hastaların sıklıkla aile hekimliğine başvurduğu göz önüne alınırsa; multidisipliner bir yaklaşım sergileyen birinci basamağın, tanı sürecini başlatan oldukça değerli bir basamak olduğunun önemi ortaya konulmaktadır.

**Anahtar Kelimeler:** Aile Hekimliği, Dispepsi, Diafragma Evantrasyonu.

## INTRODUCTION

Dyspepsia is well-recognized in medical literature as a complaint affecting millions of individuals (1). Characterized predominantly as symptoms of the upper gastrointestinal system, dyspepsia manifests as epigastric discomfort, bloating, early satiety, and postprandial fullness (1). It can significantly impair patients' daily quality of life and may necessitate prolonged therapeutic approaches.

While there are numerous causes of dyspepsia, one of the most common is termed functional dyspepsia, characterized by the onset of symptoms without a specific identifiable cause (2). Other etiologies include gastritis, peptic ulcers, gastroesophageal reflux disease, and gallstones (2). Occasionally, atypical and unexpected causes that can give rise to these symptoms are encountered.

The diaphragm is one of the most crucial muscles separating the thoracic and abdominal cavities. The preservation of its functional and anatomical integrity is critical for the proper functioning of the cardiorespiratory system (3). Traumatic diaphragmatic injuries, resulting from either blunt or penetrating thoracoabdominal traumas, are infrequently encountered (4). Diaphragmatic eventration refers to the abnormal elevation of the diaphragm due to congenital or acquired defects, atrophy, or paralysis of the muscle fibers. It signifies the herniation of abdominal organs into the thoracic cavity (5). It often progresses asymptotically and is discovered incidentally (5). Diaphragmatic eventrations most commonly occur on the left side, with those occurring on the right generally leading to more severe complications (6).

Cardiac surgery, traumas, tumors, pathologies related to muscles and nerves, granulomatous diseases, and surgical interventions concerning the thymus gland are observed as the most common causative factors (7). However, in many cases, these causes cannot be identified. In such cases, it is often believed that viral infections lead to diaphragmatic elevation or eventration (8).

Most traumatic diaphragmatic injuries occur due to high-energy traumas, particularly as a result of traffic accidents and falls from significant heights (9). According to literature data, the global prevalence of such injuries ranges between 0.8% and 5% (10). Clinical symptoms can vary depending on the location and size of the injury as well as the organs involved. These injuries can present with severe symptoms in the acute phase, or sometimes manifest with chronic symptoms that persist for months (11). In the chronic phase, clinical presentations may include atypical symptoms such as postprandial indigestion, bloating, and shortness of breath (11). Additionally, they can lead to various complications in the respiratory and digestive systems. Rare conditions like post-traumatic diaphragmatic eventration can emerge as easily

overlooked underlying causes for the aforementioned symptoms.

Radiological examinations hold significant importance in the diagnosis. The evaluation process, which starts with direct radiographs, is detailed with computed tomography in suspicious cases (12). In this case study, the objective is to contribute to the existing literature by examining the epidemiological, clinical, diagnostic, and therapeutic approaches of diaphragmatic eventration that developed post-trauma, using a case that presented with chronic dyspeptic and respiratory complaints.

## CASE REPORT

Case Presentation A 45-year-old male patient presented to our clinic with complaints of bloating, indigestion, upper abdominal pain, and occasional pronounced shortness of breath that had been persisting for the past 6-7 months. The patient reported that his dyspeptic symptoms intensified after meals and occasionally experienced a sensation of pressure in his chest along with the shortness of breath. He mentioned that these symptoms negatively impacted his daily activities and work performance. It was learned that the patient had contracted COVID-19 about three months prior but did not seek medical attention. Upon further inquiry into his medical history, the patient shared a 40 pack-year smoking history but had quit smoking 17 years ago. Upon detailed anamnesis, he revealed a trauma due to falling from a tree eight months ago. Since he did not experience any significant pain or symptoms immediately after the incident, he did not seek medical care. However, it was ascertained that he began experiencing symptoms about 2 months post the incident but did not associate his complaints with the post-fall trauma, which resulted in a delay in seeking medical assistance. He confirmed that he had not previously sought medical attention for his shortness of breath and dyspeptic symptoms. The decision to consult was made upon noticing a progressive worsening of his complaints in recent times.

Upon physical examination, mild tenderness was detected in the patient's epigastric region. Respiratory examination revealed a reduction in breath sounds on the right side, with diminished participation in respiration compared to the left side. Auscultation did not identify any significant crackles or rhonchi; however, coarse breath sounds were noted. Oxygen saturation (SpO<sub>2</sub>) measured using a fingertip pulse oximeter was 96%.

For the initial diagnostic evaluation, a posteroanterior chest radiograph (CXR) was ordered for the patient (Figure 1). The CXRs revealed a notable elevation in the right diaphragm. Based on this finding, a thoracic CT scan was requested for the patient. The results of the thoracic CT indicated that the right hemidiaphragm was

positioned higher due to liver eventration, atelectasis had developed in the right lung's middle lobe due to compression, a reduction in lung volume



**Figure 1.** Posteroanterior Chest Radiograph (CXRs)

In light of these findings, the patient was consulted with the department of chest diseases. At the chest diseases clinic, the patient underwent bronchoscopy under fluoroscopy and a respiratory function test. The evaluation of the respiratory function test indicated results in favor of a restrictive pathology. During bronchoscopy, it was observed that there was a reduction in diaphragmatic movements with respiration.

Based on these findings, the patient was referred for a thoracic surgery consultation. The thoracic surgeon assessed the patient's condition and established an appropriate surgical treatment plan. Due to the patient's pronounced symptoms, which significantly affected his quality of life, and the high risk of complications developing in the future, it was decided to perform a surgical plication procedure on the patient.

**DISCUSSION**

Diaphragmatic eventration is a clinical issue where intra-abdominal organs are shifted into the thoracic cavity due to the weakening or paralysis of muscle fibers (3). Though commonly seen in children, this condition is quite rare among adults (13). Often occurring in the right diaphragm, this disease usually presents without symptoms (14).

More than half of adult cases with unilateral diaphragmatic eventration are asymptomatic (8). In the remaining cases, symptoms such as exercise dyspnea, general muscle fatigue, chest pain, cough, and resting dyspnea can be observed (8). Our patient's increase in symptoms with positional changes and exercise is consistent with the literature. Unilateral diaphragmatic eventration in adults often goes unnoticed as it doesn't always lead to respiratory symptoms, and is generally identified incidentally. The detection of a unilateral diaphragm

was observed, and the right atrium was compressed (Figure 2).



**Figure 2.** Thoracic Computed Tomography (CT)

in a higher position in the posteroanterior lung radiograph typically prompts this diagnosis. Paradoxical movement of the diaphragm observed during inhalation with fluoroscopy (the sniff test) is usually diagnostic.

According to the literature, traumatic diaphragmatic injuries typically occur in high-energy traumas and most frequently on the left side (15). However, in our case, there was an eventration of the diaphragm on the right side, which brings into consideration a higher risk of serious complications. Furthermore, the fact that the patient's trauma resulted from a fall from height aligns with the literature.

In the case, the approach to the importance of radiological examinations has been consistent with the literature. The initial assessment with posteroanterior chest radiography (CXRs) was later detailed with tomography. This approach is typically recommended in the literature (16).

Whether the elevation of the diaphragm is due to paralysis or eventration is not crucial for treatment; its value lies only in clarifying the etiology (16). If desired, the presence of paradoxical movement in the diaphragm can be investigated with fluoroscopy (8). To illuminate the etiology, differentiate the diagnosis, rule out other pathologies, and ascertain the degree of the clinical picture, standard chest radiography, thoracic computed tomography, respiratory function tests, and other examinations can be conducted in conjunction with the patient's history (16). If required, the elevation due to eventration can also be calculated in direct and lateral chest radiographs (17). In the computed tomography scan, since the patient is lying down, the eventration becomes more pronounced, and the gas-filled stomach and intestines are better visualized (17).

Even if this pathology does not manifest any symptoms or signs, given the low rate of spontaneous recovery, it should be evaluated for surgery upon detection to protect the patient from potential side effects and problems that may arise in the future (5). The most critical surgical operation indication is the presence of respiratory restriction in the patient, confirmed with respiratory function tests (5). In adult patients with unilateral diaphragm paralysis or eventration, surgical plication is only indicated when there are symptoms (5). Although the etiologies of diaphragm paralysis and eventration differ, their pathophysiologies are similar, and both pathologies are repaired with the same surgical method (17). The aim of surgical plication is to prevent paradoxical movement during inspiration by tensioning and stabilizing the atrophied, thin, relaxed, and elevated diaphragm (17). In patients with symptomatic unilateral diaphragm paralysis or eventration, plication prevents the abdominal organs from shifting to the ipsilateral thorax and epigastric region during inspiration (18). This provides sufficient intrathoracic negative pressure for the expansion of the contralateral lung, enabling the correction of atelectasis and intrapulmonary shunts.

Moreover, the pressure on the epigastric region is reduced, alleviating dyspeptic complaints (18). Not only does the patient gain better exercise performance and lung function, but the burden on the gastrointestinal system is also reduced.

### CONCLUSION

Chronic dyspeptic complaints are a common symptom with numerous potential etiologies. However, when taking a detailed history from patients presenting with such symptoms, even though rare, serious causes like post-traumatic diaphragmatic eventration can be identified. In such atypical cases, early and accurate diagnosis can significantly improve the patient's quality of life.

Primary care family medicine represents a crucial point where patients first present with a wide range of health concerns. General symptoms, such as dyspeptic and respiratory complaints, can be directed towards more specific diagnoses through the detailed history-taking and physical examination by the family physician. This case once again underscores the role of family medicine as the first and most critical step in the multidisciplinary approach within the healthcare system.

### REFERENCES

1. Etçioğlu E, Aydın A. Birinci Basamakta Dispepsi Şikayeti Olan Erişkin Hastaya Klinik Yaklaşım. *Sakarya Tıp Dergisi*. 2020;10(Özel Sayı):69-75.
2. Karabulut S, Karabulut M, Akarsu C, Bozkurt MA, Bademler S, Kocataş A, et al. Türk Toplumunda Organik ve Fonksiyonel Dispepsili Hastalarda Etiyolojiye Yönelik Analiz. *Bakırköy Tıp Dergisi*. 2015;11(1):17-23.
3. Başara I, Balcı A, Köremiz N. Diyafram ve Göğüs Duvarı Patolojileri. *Bulletin of Thoracic Surgery/Toraks Cerrahisi Bülteni*. 2013;4(3):140-156.
4. Alpay L, Ocakcioglu I, Dogruyol T, Laçın T, Baysungur V, Yalcinkaya I. Diaphragm injury following blunt trauma/Kunt travma sonucu gelişen diyafram yaralanması. *The Journal of Kartal Training and Research Hospital*. 2013;24(2):110-4.
5. Fındık G, Aydoğdu K, Kaya S. Travma sonrası semptomatik hale gelen diyafram evantrasyonu. *Türk Göğüs Kalp Damar Cer Derg*. 2011;19(1):107-9.
6. Şehitoğulları A, Sayir F, Kahraman A, Öncü R, Soyoral L. Diafragmanın travmatik yaralanmaları. *Dicle Tıp Dergisi*. 2012;39(2):257-61.
7. Çakırca M, Çakırca M, Et G, Daglı C, Isgüven D. Anesthesia approach in a patient with hemidiaphragma paralysis; case report. *Turkish Journal of Anaesthesiology & Reanimation*. 2011;39(4):215.
8. Bircan A, Çakır M, Öztürk Ö. İdiyopatik edinsel tek taraflı diyafragma evantrasyonu: Olgu sunumu. *SDÜ Tıp Fakültesi Dergisi*. 2011;18(4):132-5.
9. Kavurmacı Ö, Akçay O. Toraks Travmalarında İleri Yaş Neleri Değiştirmektedir? *Sakarya Tıp Dergisi*. 2020;10(1):11-6.
10. Karpuz Ç. Acil servise başvuran hastalara çekilen toraks bilgisayarlı tomografilerin değerlendirilmesinde acil tıp uzmanlık öğrencilerinin tomografileri yorumlamadaki doğruluk ve güvenilirlik derecelerinin araştırılması [uzmanlık tezi]. [Bursa(TR)]: Bursa Uludağ Üniversitesi; 2018.
11. Erkan S, Yabanoğlu H, Gündoğdu R, Kuş M, Erkent M. Erişkin Konjenital Diafragma Hernisi Cerrahi Tedavi Sonuçlarımız. *Muğla Sıtkı Koçman Üniversitesi Tıp Dergisi*. 2022;9(2):142-6.
12. Öztıp MC. Son on yılda kliniğimizdeki toraks travmalı olguların değerlendirilmesi [uzmanlık tezi]. [Edirne (TR)]: Trakya Üniversitesi Tıp Fakültesi; 2005.
13. Özdemir Ö, Daştan TM. Çocuklarda Nadir Görülen Diyafragma Evantrasyonu. *Sakarya Tıp Dergisi*. 2021;11(3):675-9.
14. Tunç T, Kul M, Eker İ, Vurucu S, Çalışkan B, Sarıcı SÜ, et al. Solunum sıkıntısı bulguları olan bir yenidoğanda frenik sinir zedelenmesine bağlı diyafragma paralizisi: olgu sunumu. *Gülhane Tıp Dergisi*. 2009;51(1):55-7.
15. Şehitoğulları A, Sayir F, Kahraman A, Öncü R, Soyoral L. Traumatic injuries of the diaphragm. *Dicle Tıp Dergisi*. 2012;39(2):257-61.
16. Akay HÖ, Barç M, Özbek MN. Diyafragma patolojilerinde radyolojik görüntüleme. *Dicle Tıp Dergisi*. 2004;31(1):13-9.

17. Yalçinkaya İ, Baytemir Atinkaya C. Diyafram Paralizisi ve Evantrasyonu. Türkiye Klinikleri Göğüs Cerrahisi Dergisi. 2020(1):38-44.
18. Işık AF, Yalçinkaya İ, Kurnaz M. Erişkinlerde diyafragma yükselmeleri; cerrahi gerekli mi? Van Tıp Dergisi. 2002;9:33-7.