

## A mature cystic teratoma located in the posterior mediastinum

### *Arka mediastinum yerleşimli matür kistik teratom*

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Although mature teratomas are often in close proximity with thymus in the anterior mediastinum, nearly 3-8% may localize in the posterior mediastinum. A 15-year-old male patient was admitted with back and low back pain lasting for four months. Thoracic computed tomography demonstrated a multiloculated lesion in the posterior mediastinum lateralized to right containing fluid and fat density with a calcified wall. The mass was totally excised by right thoracotomy. Histopathological examination revealed a mature cystic teratoma characterized by cystic structures having irregular arrangement with hair and fat tissues.

**Keywords:** Germ cell neoplasm; mediastinum; teratoma.

Matür teratomlar sıklıkla timusa komşu olarak ön mediastende görülmesine rağmen, yaklaşık %3-8'i arka mediastende yerleşebilmektedir. On beş yaşında erkek hasta dört aydır süren sırt ve bel ağrısı yakınması ile başvurdu. Toraks bilgisayarlı tomografisinde arka mediastende sağ tarafta bulunan, içerisinde sıvı ve yağ yoğunlukları gözlenen, duvarında kalsifikasyonlar bulunan multiloküle lezyon izlendi. Kitle sağ torakotomi ile tamamen çıkarıldı. Histopatolojik incelemede kistik, düzensiz görünümlü, içerisinde saç ve yağ dokuları tespit edilen kistik yapılar ile karakterize matür kistik teratom tespit edildi.

**Anahtar sözcükler:** Germ hücreli tümör; mediasten; teratom.

The most common extragonadal localization of germ cell tumors is the anterior mediastinum, and mediastinal germ cell tumors account for 15% of all anterior mediastinal tumors in adults. The most common type of these tumors are teratomas, which contain at least two of three primitive germ layers,<sup>[1]</sup> and these may involve mature, immature, or malignant components.<sup>[2]</sup> While mature teratomas are often in close proximity to the thymus, 3-8% of them are found in the posterior mediastinum.<sup>[1,3,4]</sup> Herein, we present a male patient with a posterior mediastinal mature cystic teratoma.

### CASE REPORT

A 15-year-old male patient presented with lower back and back pain that had persisted for four months. A physical examination didn't reveal any pathological findings, and his breath sounds were normal. In the posteroanterior chest X-ray (CXR), a right paracardiac indentation was seen (Figure 1). In addition, thoracic

computed tomography (CT) revealed a multiloculated lesion at the paravertebral region of the right hemithorax that was compressing against the neighboring lung and causing atelectasis. This lesion extended from the right inferior pulmonary vein to the right cardiophrenic sinus and was also compressing against the inferior vena cava (IVC) from the anterior aspect. Furthermore, the CT showed a close relationship with the aorta at the medial aspect. The lesion measured 9x8x6 cm in diameter and contained fluid, fat densities, and a calcified wall (Figures 2a and b). In addition, the alpha-fetoprotein (AFP) and beta-human chorionic gonadotropin ( $\beta$ -hCG) levels were normal, and the pulmonary function test results revealed a forced expiratory volume in one second (FEV<sub>1</sub>) of 2.95 (84%), a forced vital capacity (FVC) of 3.30 (80%), and FEV<sub>1</sub>/FVC of 89%.

The patient underwent the operation based on the preliminary diagnosis of a mediastinal teratoma. The thoracic cavity was accessed through the right seventh



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**Figure 1.** Chest X-ray showing the right paracardiac indentation (arrowheads).

intercostal space via a posterolateral thoracotomy under left selective intubation, and in the posterior mediastinum, the mass was located in the inferior lobe of the right lung, (Figures 3a and b). The pulmonary ligament was released and the mediastinal pleura surrounding the mass was then incised. The tumor, which was reddish pink in color and hemorrhagic, was subsequently totally excised via both blunt and sharp dissection. The tumor was tightly adhered to the chest wall, but in the medial plane, it was

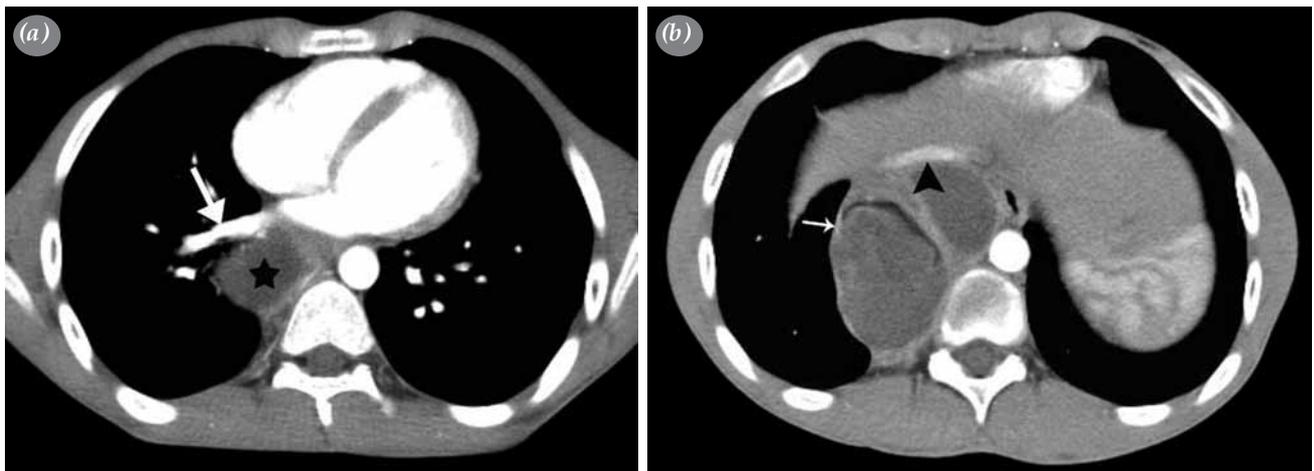
softly attached to the neighboring structures. For this reason, digital dissection was sufficient in this plane. A histopathological examination identified a mature cystic teratoma characterized along with an irregular interior arrangement that contained hair and fat tissues (Figure 4a, b).

## DISCUSSION

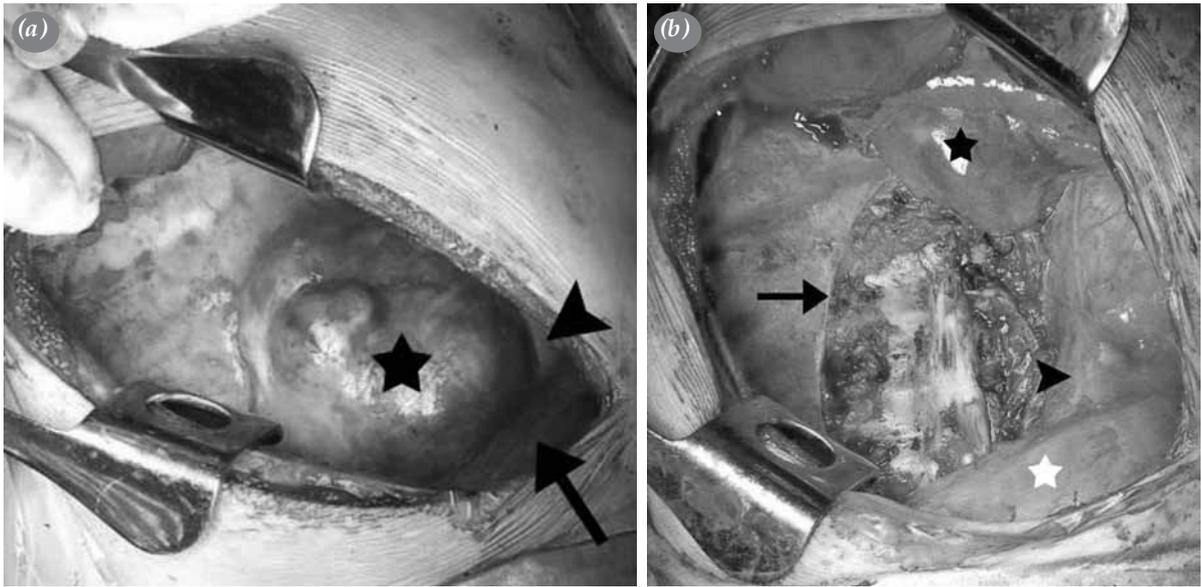
If mature teratomas with posterior mediastinal localization are adequately large in the newborn and early childhood periods, they can compress against the neighboring organs, resulting in respiratory problems. However, in adults, they are usually asymptomatic and are incidentally found in chest radiographs.<sup>[5]</sup> Symptomatic cases complain more often about chest pain. Moreover, cough, dyspnea, and hemoptysis due to access to the bronchial tree may also be observed. Due to their cystic nature, compression-dependent symptoms are rare, even when the tumor is large.<sup>[6]</sup> The only symptom our patient had was pain, and we diagnosed the teratoma when we were evaluating him for this. Furthermore, his physical examination revealed no venous congestion or any other abnormalities, in spite of the compression against the IVC.

Some neurogenic tumors with possible posterior mediastinal localization may actually be liposarcomas, neuroenteric cysts, extramedullary hematopoiesis, or mass lesions, for example extralobar sequestrations.<sup>[1]</sup>

Germ cell tumors can be divided into three groups: benign teratomas, seminomas, and embryonic tumors, with the latter having malignant teratoma and



**Figure 2.** Computed tomographic view showing a multiloculated lesion (star) and the paravertebral localization in the right hemithorax. (a) The lesion extended from the right inferior pulmonary vein (arrow) to the right cardiophrenic sinus; (b) The lesion was compressing against the inferior vena cava from the anterior aspect (arrow head) and was touching the aorta at the medial aspect. It measured 9x8x6 cm in diameter and contained fluid, fat densities, and a calcified wall (arrow).

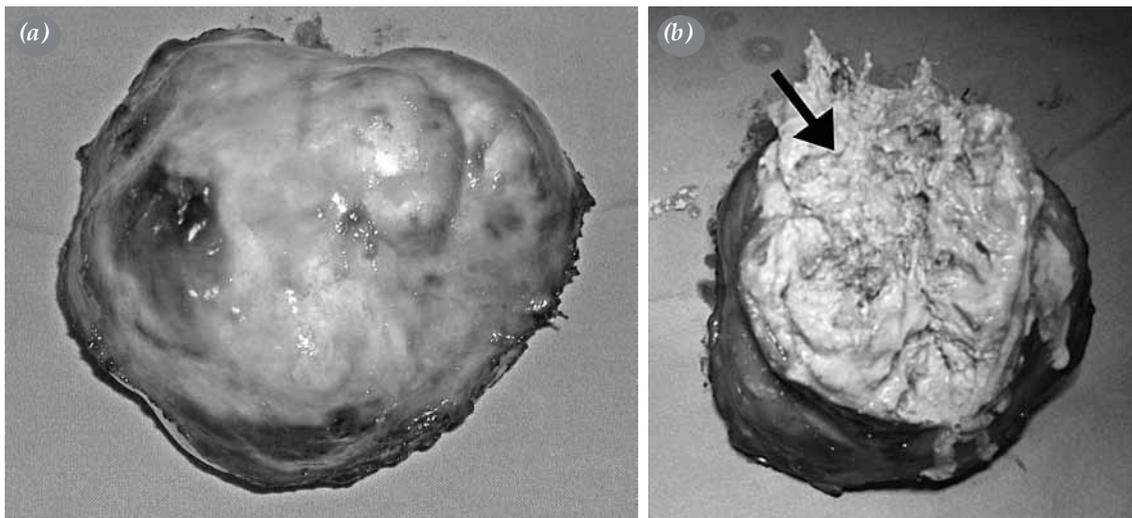


**Figure 3.** (a) An intraoperative view showing the posterior mediastinal mass (star), inferior vena cava (arrow head), and the diaphragm (arrow); (b) A view after the excision of the mass showing the collapsed lung (star), inferior vena cava, (arrowhead), diaphragm (white star), and line of the parietal pleura (arrow).

non-seminomatous germ cell tumoral involvement. In the diagnosis of embryonic tumors, AFP and  $\beta$ -hCG are used as serological markers.<sup>[7]</sup> In our case, the AFP and  $\beta$ -hCG values were within normal limits.

Imaging studies of teratomas begin with a CXR, which commonly shows an anterior mediastinal mass lesion with smooth borders that is usually localized on either side of the mid-line.<sup>[3]</sup> Additionally, the CXR is used because it has a low sensitivity when detecting calcification and fat density. In a retrospective

study conducted on 66 mediastinal teratoma cases, Moeller et al.<sup>[4]</sup> found calcification in 22% of the patients and teeth in two others, whereas an air-fluid level within the tumor was only identified in one case. Thoracic CT is another important tool for examining teratomas because it provides the ability to clearly view the borders of the tumor along with realistic information about the structures included in the teratoma, such as soft tissue, fluid, fat, calcification, and teeth.<sup>[1,4]</sup> Moeller et al.<sup>[4]</sup> found a multilobular structure in 85% of their cases, cystic structure in 88%,



**Figure 4.** (a) Excised mass; (b) The mass containing hair and fat (arrow).

fat density in 76%, and calcification in 53%. Another option is magnetic resonance imaging, which allows for a better examination of the relationship between the teratoma and the surrounding tissues.<sup>[3]</sup> However, it does not provide any added value to the CT regarding the radiological examination of these tumors.<sup>[4]</sup> In our case, a right paracardiac indentation was found on the CXR, and a multilocular lesion was revealed on the thoracic CT.

Mature teratomas usually have a well-bordered capsule and are normally lobular and multi-cystic.<sup>[3,4]</sup> They include at least two of three germ layers and generally include ectodermal tissues such as hair, skin, sweat glands, and teeth. Mesodermal tissues such as fat, cartilage, bone, and smooth muscle, and endodermal tissues, for example the respiratory and intestinal epithelium, are seen less often.<sup>[8]</sup> In our case, the pathology result showed hair as well as mesodermal components such as fat.

Mature teratomas are benign tumors, and the main treatment approach is total surgical excision. They may present difficulties if they are too close to neighboring vital structures like the IVC, thoracic duct, lungs, or thoracic aorta. In a series containing 93 patients with mature teratomas, Takeda et al.<sup>[9]</sup> reported that when a complete resection was performed, three patients also required a lobectomy combined with tumor extirpation, five underwent an additional partial resection of the lung, and seven had a pericardiectomy. In our case, neither lung nor pericardial resection was required for the complete resection. The recurrence rate is nearly zero when a complete resection is performed or when the teratoma contains no immature structures.<sup>[7,9]</sup> For instance, Takeda et al.<sup>[9]</sup> reported no mortality in their study that was conducted over a period of 120 months. Currently, our patient is still being followed up and is experiencing no problems.

In conclusion, a posterior mediastinal teratoma should be kept in mind for the differential diagnosis of patients who present with back and lower back pain.

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