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Surgical Resection of a Mediastinal Teratoma Adherent to the Pericardium

Perikarda Yapışık Mediastinal Teratomun Cerrahi Olarak Çıkartılması

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ABSTRACT

Mediastinal teratomas, a rare form of germ cell tumors in children, account for only 4.3% of all germ cell tumors. In most cases, patients with mediastinum tumors have no symptoms (53%), and their masses are frequently diagnosed incidentally on routine chest radiography. In the literature, the outcomes of surgical excision for the treatment of mediastinal teratomas and the results are inconclusive. We present a one-year old male child who experienced recurrent upper respiratory tract infections and was diagnosed with a benign mature teratoma adherent to the pericardium. The child underwent surgical excision.

In conclusion, mediastinal teratomas located in the anterior mediastinum should be kept in mind in the differential diagnosis in children whose chest x-rays reveal a mass or unspecific opacity in the mediastinum. These are usually benign with a good response to total resection. Thoracotomy is one of the appropriate surgical approaches.

Key Words: Children, Mediastinum, Teratoma

ÖZ

Mediastinal teratomlar çocuklarda tüm germ hücreli tümörler içinde % 4.3 oranında görülen, germ hücreli tümörlerin ender bir tipidir. Mediastinal tümörleri olan hastaların çoğunda herhangi bir semptom görülmez (%53) ve kitle genellikle rutin akciğer grafileri sırasında tesadüfen saptanır. Literatürde mediastinal teratomların tedavisinde cerrahi eksizyonun sonuçları tartışmalıdır. Çalışmada, sık tekrarlayan üst solunum yolu enfeksiyonları ile bulgu veren, perikardiyuma yapışık benign matür teratom tanısı alan bir yaşındaki erkek çocuğun sunulması planlandı. Teratom cerrahi olarak eksize edildi.

Sonuç olarak, akciğer grafisinde mediastinumda kitle ya da opasite görülen hastaların ayırıcı tanısında anterior mediastinum yerleşimli teratomlar akılda bulundurulmalıdır. Mediastinal teratomlar genellikle benign ve total rezeksiyona iyi yanıt verirler. Torakotomi uygun cerrahi yaklaşımlardan biridir.

Anahtar Sözcükler: Çocuk, Mediasten, Teratom

INTRODUCTION

Mediastinal teratomas, a rare form of germ cell tumors in children, accounts for only 4.3% of all germ cell tumors. Typically, these tumors have components derived from two or more embryonic layers and have a benign character (1).

In most cases, patients with mediastinum tumors have no symptoms (53%), and their masses are frequently diagnosed incidentally on routine chest radiography (2). After found incidentally on chest X-rays, chest computed tomography (CT) should be performed for a definitive work-up in order to describe the location and relationship to nearby structures.

Although mediastinal teratoma has a benign character and is mostly found incidentally, its surgical outcome is still a matter of discussion in the literature because of its rare incidence. Today, complete surgical resection either via thoracotomy or video-assisted thoracoscopic surgery (VATS) is accepted as the first-line treatment methodology for mediastinal teratomas (3). We aimed to report our experience with surgical resection of a mediastinal teratoma adherent to the pericardium and aimed to discuss the differential diagnosis and possible treatment alternatives.

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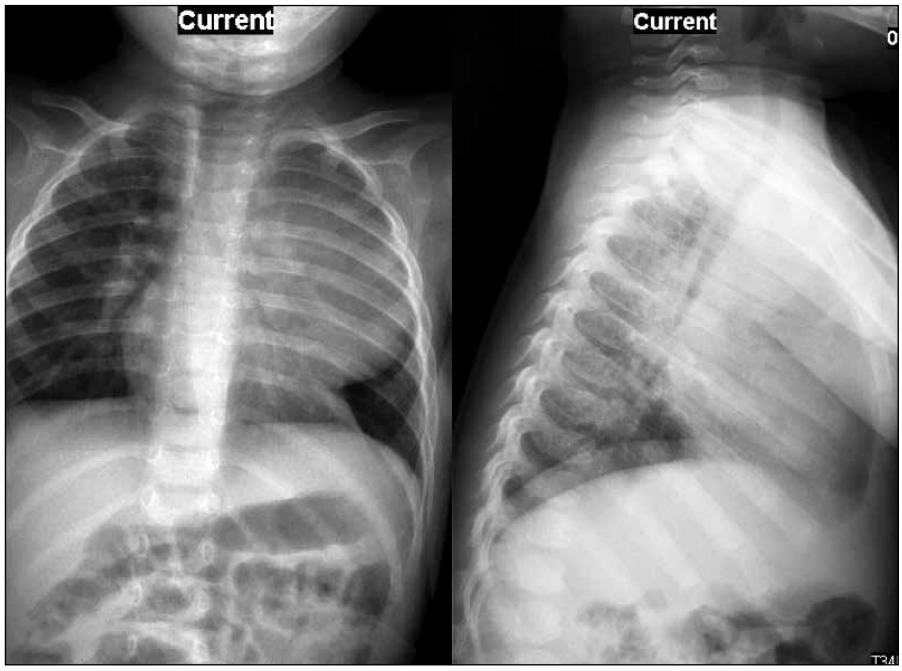

Figure 1: Chest radiography on admission showing a large mediastinal mass extending to the left hemithorax.

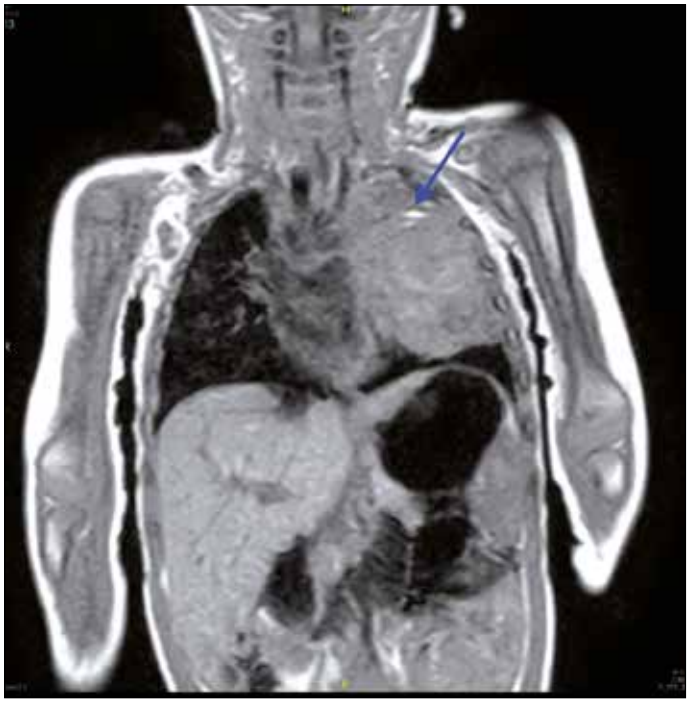

Figure 2: At T1 intense images on MRI, the mass has a heterogeneous intermediate signal intensity pattern and a T1 hyperintense fat tissue component can be seen at the superior part of the mass.

CASE

A one-year-old male child with recurrent upper respiratory tract infections was referred to our hospital's outpatient clinics for the evaluation of an asymptomatic mediastinal mass. The mass was firstly diagnosed incidentally in a peripheral hospital with routine chest X-rays. The child's history revealed that he had only some minor symptoms in regard to his respiratory tract infection and had no history of cyanosis, choking episodes, feeding difficulty, noisy breathing and vomiting or urinary complaints.

On admission, the physical examination (PE) revealed no systemic or local abnormality apart from slightly decreased breath sounds on the left side in auscultation. A large mass occupying the anterior mediastinum and the left thoracic cavity was detected on chest X-ray (Figure 1). Chest magnetic resonance imaging (MRI) was performed and a mediastinal mass, measuring 62x51x46 mm, occupying the entire left thoracic cavity was detected. The mass was compressing the pulmonary parenchyma and the main vascular structures and was composed of multiple cysts with calcifications and fat, suggestive of a mature teratoma (Figure 2). Transthoracic echocardiography revealed a well-defined lobulated round mass adhered to pericardium. The α-fetoprotein and β- human chorionic gonadotropin levels were 16.45 ng/ml (0-9) and <0.1 (<0.26), respectively.

A left-sided thoracotomy was performed locating the mass in the anterior mediastinum and the left thorax, compressing the entire left lung. There were multiple adhesions to the pericardium, thymus and the left lung. A combination of blunt and sharp dissection was performed for the excision of the adhesions. For better operative exposure, the tumor was punctured and its fluid content was aspirated. The 6x5x5cm multiseptate cyst with areas of calcifications and solid tissue containing hair and bone was resected (Figure 3A, B). The chest tube was removed on the second postoperative day.

The child was discharged on the third postoperative day. Histopathological examination confirmed the diagnosis of a benign mature teratoma. The child is well on 3 months of follow-up.

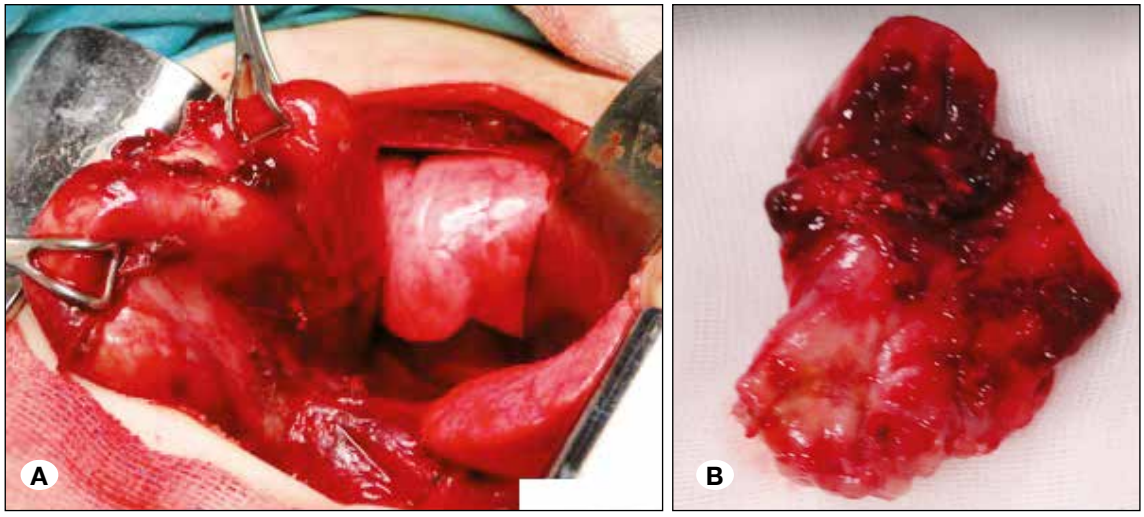

Figure 3:
A) The thoracic mass adherent to the pericardium after aspiration.
B) The macroscopically heterogeneous mass was detached from the pericardium with fine dissection and excised totally.

DISCUSSION

Mature teratomas are the most common histological type of germ cell tumors.[4] They contain usually well-differentiated tissues from all three layers; ectoderm, mesoderm and endoderm (3). The most common extra-gonadal site for a mature teratoma is the anterior mediastinum (3). The diagnosis of mature teratoma is usually incidental and half the patients have no complaints unless the mass is not adherent and compresses the mediastinal structures as such as the heart, great vessels, esophagus and bronchus (4).

Patients can also present to outpatient clinics with undefined symptoms such as fever, chest pain, dyspnea, recurrent respiratory tract infections, cough and even trichoptysis (1,3,4). In the literature, there are various case reports that presented as mediastinal abscesses and all were diagnosed as mediastinal teratoma (5). In the current case report, bronchogenic cyst and extralobar pulmonary sequestration cyst were the most likely differential diagnoses before surgery.

Mediastinal teratomas are usually demonstrated by incidental chest X-rays but further investigation is required with CT and MRI. MRI gives detailed information about adhesions and invasion degree of the mass to surrounding tissues and also helps in the differential diagnosis (6). Echocardiography should also be performed if there is a suspicion of heart or pericardium invasion as in the current case. Echocardiography revealed an adhesion between the mass and the pericardium even though the MRI did not show this.

Surgery aims complete removal of the mass in mature teratomas if possible. Otherwise partial resection is acceptable. Partial resection is a favorable way especially when the teratoma is adherent to vital structures located in the mediastinum such as the heart, pericardium and great vessels. Sternotomy or thoracotomy or both simultaneously can be performed according to size and localization of the mass (6). Although the teratoma was adherent to the pericardium in the current case, it was possible to separate all adhesions and remove the mass in total and the pericardium could be kept intact. The dissection became easier when the fluid component of the teratoma was aspirated through a small incision as Yokohama et al. described in their paper (6).

In conclusion, mediastinal teratomas located in the anterior mediastinum should be kept in mind in the differential diagnosis in children whose chest x-rays reveal a mass or unspecific opacity in the mediastinum. These are usually benign with a good response to total resection. Thoracotomy is one of the appropriate surgical approaches.

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