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Mature Teratoma of the Posterior Mediastinum: A Case Report

Mature teratomas are the most common type of mediastinal germ cell tumors. They typically occur in young adults (15 to 35 years) and 95% of these teratomas occur in the anterior mediastinum.

Herein, we report a case of a huge mediastinal teratoma in a 16-year-old boy who presented with a history of chest pain, cough, exertional dyspnea, and fever. Chest X-ray and spiral computed tomography (CT) revealed a bulky mass of 20cm×15cm in the right side of the posterior mediastinum. The operative finding was a large cystic mass in the posterior mediastinum adherent to the neighbor organs. The cyst was filled with sebum, hair and calcified materials.

The resected tumor was in the posterior mediastinum, although most of these tumors occur in the anterior mediastinum. To the best of our knowledge, this is the first documented report in Iran.

Keywords: Teratoma, Mediastinum, Spiral Computed Tomography, Surgery

Introduction

Mediastinal mature teratoma is a rare primary germ cell neoplasm composed of well-differentiated tissues derived from more than one of the three embryonic germ cell layers.[1] Only 5%-10% of germ cell tumors are extragonadal and mediastinum is the most common extragonadal site. Almost all benign teratomas occur in the anterior mediastinum. Only 3% are located in either the posterior mediastinum or have extension to the posterior mediastinum.[2] These mature teratomas are rare, benign, slow–growing neoplasms that usually occur within or near the thymus gland and account for up to 75% of primary germ cell tumors of the mediastinum.[3,4]

About 36% of patients with mediastinal tumors are asymptomatic at the moment of diagnosis.[5] Consequently, these tumors tend to be diagnosed by chance during chest imaging. When symptoms are present, they may be due to compression, invasion of adjacent intrathoracic structures or associated to other syndromes.[6]

Operation of this tumor is more difficult than common posterior mediastinal tumors such as schwannoma, due to chemical irritation of the surrounding tissue and dense adhesion between this tumor and neighboring structures. Therefore, it is noteworthy that thoracic surgeons must be aware of this occurrence.

Here, we report a rare case of a mature cystic teratoma in the posterior mediastinum. To our knowledge, there has been no reported case of posterior mediastinal teratoma in the Iranian medical literature.

Case Presentation

A 16-year-old boy was referred to the surgery department of Imam Khomeini Hospital, Urmia with the chief complaint of vague chest pain, dry cough, fever,

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and exertional dyspnea of about 2 months, prior to admission. In physical examination, the vital signs were normal. He was dyspneic in the supine position. In inspection, the chest was normal. In auscultation, the breath sound was reduced in the upper part of the right hemithorax. Dullness was discovered in percussion of the right hemithorax.

Chest X–rays showed a circumscribed mass in the right upper part of the hemithorax. The mass was a well-defined, oval shaped mass without calcification or cavitation (Figs. 1A&B).

The thoracic spiral CT was carried out on an X-vision/SP (Toshiba, Tokyo) with IV contrast (ultravist, 120cc). The slice thickness was 1cm. CT showed a heterogeneous mass with various densities (HU=19, HU=-120, HU=35, HU=400) including fat, soft tissue, and calcium. The size of the mass was 20cm×15cm and was located in the posterior mediastinum (Fig. 1C).

The patient was prepared for operation with the diagnosis of a posterior mediastinal mass. Right posterolateral thoracotomy was performed. The operative finding was a large cystic mass in the posterior mediastinum.

The mass was adherent to adjacent organs. Adhesions were released and the mass was resected with a wedge of the lung tissue. Gross examination of the cyst showed it contains sebum, hair, and calcified materials (Fig. 2).

On histopathological evaluations, the sections showed cystic structures lined by keratinized stratified squamous epithelium and contained sebaceous gland, neural tissue, adipose tissue, hair, and ossified areas (Figs. 3A-C).

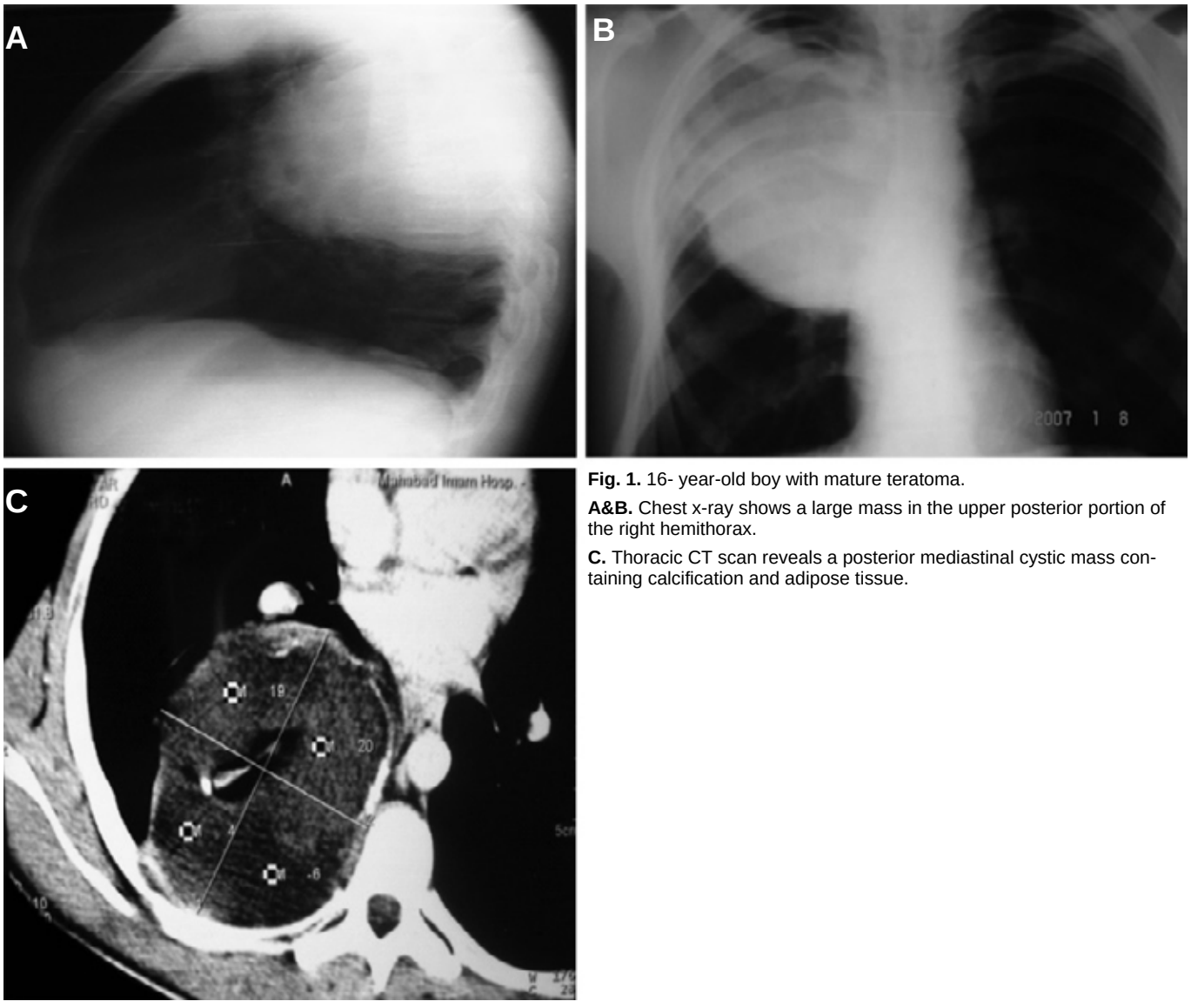

Fig. 1. 16- year-old boy with mature teratoma.

A&B. Chest x-ray shows a large mass in the upper posterior portion of the right hemithorax.

C. Thoracic CT scan reveals a posterior mediastinal cystic mass containing calcification and adipose tissue.

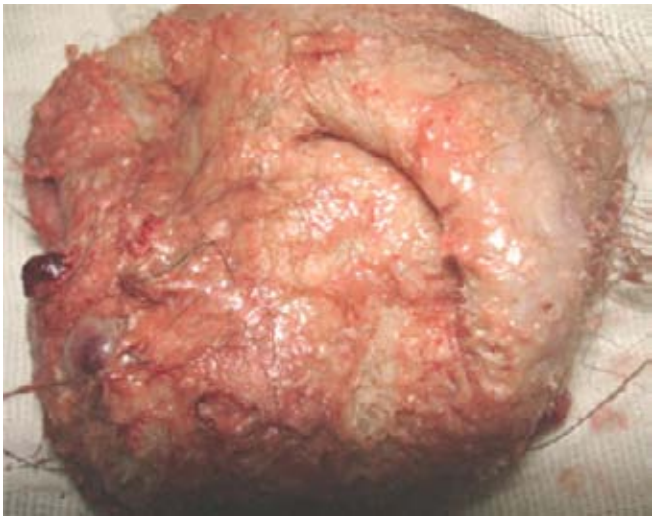

Fig. 2. 16- year-old boy with mature teratoma. Photograph of the resected teratoma.

The patient was discharged from the hospital 6 days after the operation. Follow–up after 6 months has shown him free of disease.

Discussion

Germ cell tumors account for approximately 15% of mediastinal tumors. 85% of these tumors are benign in adults. In children, these tumors account for 25% of mediastinal tumors, which are all benign.[1,2] Typically, germ cell tumors present clinically in young adults in the second to fourth decade of life.[2,7] Almost all of the benign teratomas occur in the anterior mediastinum.[2,8,9] Their location in the posterior mediastinum is rare.[1,2,7]

Speculations regarding the cause of mediastinal teratomas are numerous. Perhaps the most widely accepted theory contends that extragonadal mediastinal teratomas arise from dislocated germ cells misplaced during their migration from the yolk sac endoderm to the gonad during early embryogenesis.[1]

It has been generally believed that most patients with mediastinal mature teratoma are asymptomatic.[2,10] The most common clinical symptoms of mediastinal germ cell tumors include dyspnea (25%), thoracic pain (23%), cough (17%), fever (13%), weight loss (11%), superior vena cava occlusion (6%), and extrathoracic pain (5%).[11]

Occasionally, when the tumor erodes into an airway, the patient may cough up hair (trichophytosis)

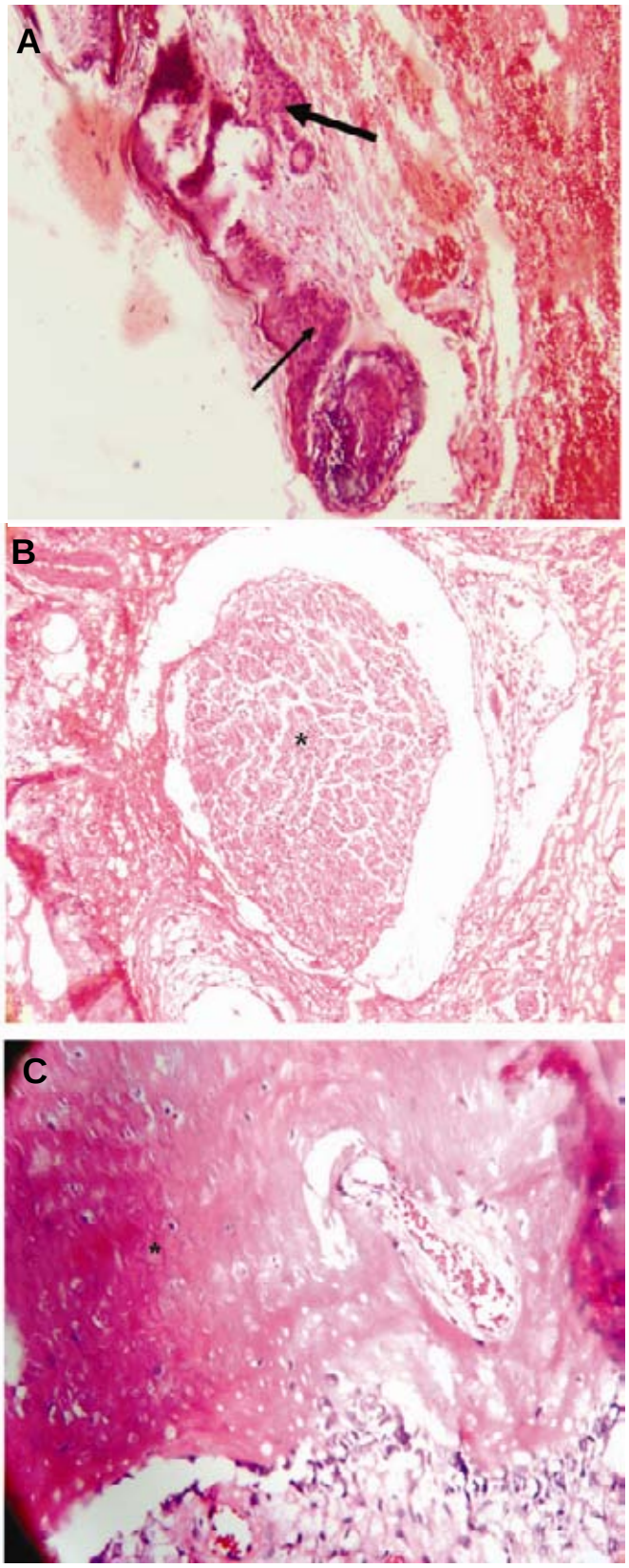

Fig. 3. Histopathological features of the mature teratoma.

A. Skin, stratified squamous epithelium (thin arrow) and hair follicles (thick arrow).

B. Neural tissue in the center of feature (*).

C. Ossification area (*).

or sebum which is pathognomonic of a benign mediastinal teratoma.[2,7]

Most benign teratomas are discovered on routine chest radiography. A well-circumscribed anterior mediastinal mass is suggestive of a benign teratoma.[2,7,12]

Cross sectional imaging, using CT scan allows identification of different elements within these tumors including soft tissue, fluid fat, and calcium. Moeller et al. noted calcification materials in 22% of the cases.[1] The CT scan usually demonstrates a thick-walled cystic mass with areas of calcification intermixed within areas of fat density. However, in CT scan it should be differentiated from complicated hydatid cysts, neurogenic tumors with necrosis, and congenital cysts with calcification.[2]

Total resection is the treatment of choice for benign germ cell tumors. This procedure can be achieved by lateral thoracotomy or median sternotomy, depending on the size and location of the tumor. When it involves intrathoracic structures, removal may be difficult.[13]

These benign teratomas may frequently become adherent to adjacent structures.[7]

In our case, adherence to the lung was evident. The trachea was compressed to the upper part of the mediastinum.

The size of the tumor was 20cm×15cm, which is large compared with other reports. In 1997, Moeller et al. reported the size of 63 tumors that ranged from 5 to 17.5 cm (mean size, 10.3).[1]

Complete excision including the lung, thymus or pericardium can usually be accomplished if necessary. It may be crucial to leave some of the tissue behind to avoid injury to vital structures. Partial resection still relieves symptoms frequently without relapse.[2,14]

Our case was operated with the preoperative diagnosis of complicated hydatid cyst. The operative finding was a cystic mass with severe adherence to the lung and deviation of the trachea. The tumor was excised with a wedge of the lung. In comparison with other reported cases, all symptomatic cases were older than 20 years, but our case was younger. Another symptomatic case, similar to our case was presented with respiratory symptoms.

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