Case Report

Mediastinal space-occupying lesion – Mature teratoma: A case report

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ABSTRACT

Mediastinal teratomas are germ cell tumors located in the anterior mediastinum, representing the most common extra-gonadal germ cell tumors. They account for approximately 15% of anterior mediastinal masses in adults and approximately 25% of anterior mediastinal masses in children. Here, we report a case of successful surgical management of a large mediastinal mature teratoma in a 6-year-old boy. This case highlights an uncommon cause of chest pain in children and underscores the importance of considering mass lesions in the differential diagnosis.

Key words: Germ cell tumors, Mediastinal mass, Teratoma, Video-assisted thoracoscopic surgery

The mediastinum is the most common site for chest mass in childhood [1]. As per etiology, these cases can be divided into congenital anomalies, infectious, benign and malignant neoplasms, and pseudomasses (e.g., prominent thymus) [1-3]. Middle mediastinal masses, comprising 20–25% of all mediastinal masses, are further classified into vascular and non-vascular lesions. Mediastinal tumors are benign, asymptomatic, and grow slowly. Sometimes, they may spread to the point where they impact adjacent anatomical tissues, producing symptoms and possibly delaying or incorrectly diagnosing the condition. Incidence of these teratomas is approximately one in 4000 live births [4].

Chest pain in children is a common complaint and is most frequently attributed to benign or self-limiting causes such as musculoskeletal trauma, infections, costochondritis, empyema, or gastrointestinal symptoms. As a result, sometimes serious underlying pathologies are often missed. Hence, clinicians should maintain a wider index of suspicion, as occasionally chest pain could be a presenting symptom of mass lesions in the mediastinum. This case is being presented to highlight the importance of considering mass lesions in the differential diagnosis of chest pain, especially when symptoms are atypical or disproportionate to common causes.

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CASE DESCRIPTION

A 6-year-old boy presented with a history of a fall while playing in the park, followed by chest pain on the left side. The pain was dull, aching in nature, and associated with a feeling of heaviness in the chest. It was aggravated by a trivial injury sustained in the park and progressively increased in intensity over the 3–4 days before admission.

Examination revealed poor air entry on the left side. Chest X-ray (CXR) showed homogeneous opacity in the mediastinum with reduced aeration of the left lung (Fig. 1). Bedside point of care ultrasound suggestive of a loculated collection in the left anterior chest with consolidation in the left middle and lower lobes. Contrast-enhanced computed tomography (CT) chest signifies a large, well-defined, predominantly cystic, anterior hypodense left-sided mediastinal mass measuring 78 × 65 × 105 mm (Anteroposterior × Trans × Craniocaudal) with areas of calcifications and fat within, along with mass effect on the pulmonary trunk and the left main pulmonary artery (Fig. 2a) without signs of invasion. There was mild narrowing of the left main bronchus and the major bronchi (Fig. 2b), highly suggestive of cystic teratoma. Alpha-fetoprotein (AFP), beta human chorionic gonadotropin (HCG), and lactate dehydrogenase were measured to rule out germ cell tumors and lymphoma was normal.

Video-assisted thoracoscopic surgery was done, where we found features of a thoracic mature teratoma-dermoid, containing bone, fat, and mucinous material.

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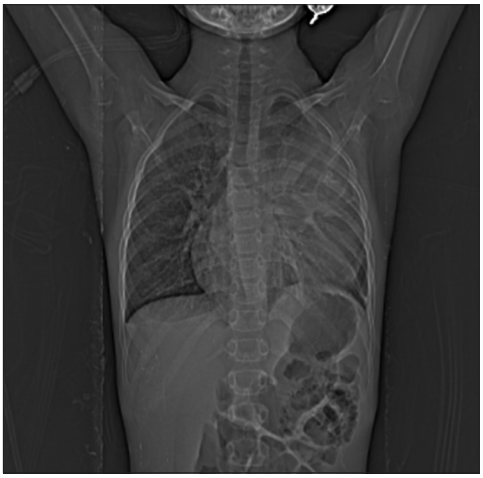

Figure 1: Preoperative chest X-ray showing homogenous opacity in mediastinum

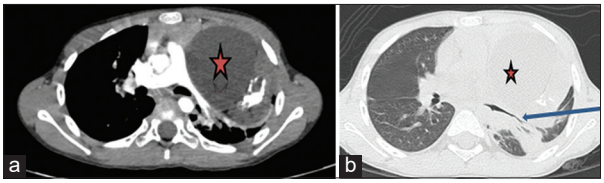

Figure 2: Contrast-enhanced computed tomography chest showing (a) well-defined cystic anterior mediastinal mass with narrowing of left main pulmonary artery. (b) Large anterior mediastinal mass (represented as star) with narrowing of left main bronchus (represented as arrow)

After initial fluid aspiration, the mass was removed in toto (Fig. 3). Aspirated cystic fluid was negative for malignant cells. Biopsy report revealed a cyst wall lined by stratified squamous epithelium and its adnexal structures, sebaceous glands and hair follicles, tissue components of bronchial mucosa with mature cartilage in the wall. Areas of mature neural tissue were also noted amidst these areas, features consistent with mature cystic teratoma with mature glioneuronal tissue.

Postoperatively, the child was transferred to the pediatric intensive care unit with left intercostal drainage (ICD) tube and minimal oxygen support. ICD was removed and discharged to room air by post-operative day 4. Follow-up CXR showed good aeration in the left lung (Fig. 4).

DISCUSSION

The word teratoma is derived from Greek words "terato" meaning monster and "onkoma" meaning "swelling" [4,5]. Mediastinal teratomas are derived from pluripotent embryonic cells that will eventually differentiate into tissues with all three germ cell layers. These teratomas are typically detected in the second and third decades of life and affect both sexes equally [6].

The most common sites of presentation are sacrococcygeal (40%), ovarian (25%), testicular (12%), cerebral (5%), and other places, including neck and mediastinum (18%) [4]. The frequency of mediastinal teratomas ranges from 1% to 5% [7]. Malignant forms of teratomas are more prevalent in adolescence, while pure

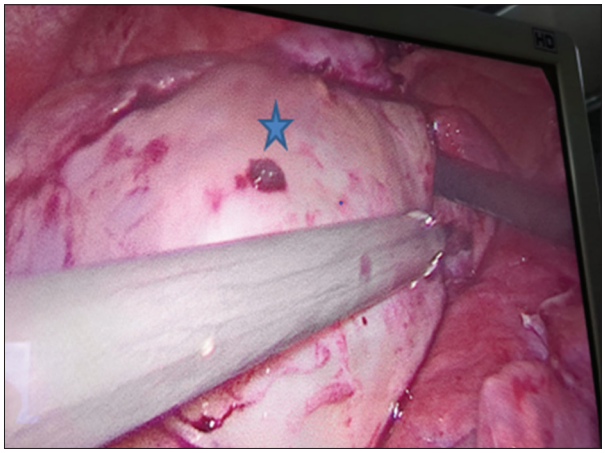

Figure 3: Intraoperative picture of the teratoma (★)

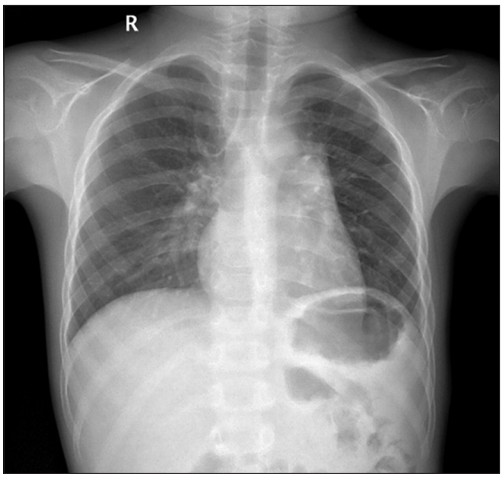

Figure 4: Chest X-ray on follow-up showing good aeration in the left lung

mediastinal teratomas are frequently discovered in the first 5 years of a child's life [8,9]. They can be classified into mature solid or cystic teratoma, immature teratoma, and teratoma with malignant transformation [10].

In children, a mediastinal teratoma usually manifests as an anterior mediastinal mass. Possible differential diagnoses for an anterior mediastinal mass in children include thymoma, lymphoma, thymic cyst, lymphangiomas, neurogenic tumors, germ cell tumors, and mesenchymal tumors [10].

Mediastinal benign teratomas are well-circumscribed heterogeneous masses that have radiographic characteristics of multilocular cysts with solid and fatty components in addition to calcifications. The radiographic characters may not be present in every case, and only 20–40% of cases show evidence of calcifications [4]. Mediastinal teratomas are generally asymptomatic in 60% of patients and are diagnosed incidentally, during a CXR for other indications [10]. Conversely, non-specific symptoms are caused by mediastinal tumors and are typically linked to tumor growth that compresses the surrounding structures because of the mass effect on the mediastinal structures [10,11]. Chest pain, respiratory failure, coughing, dysphagia, and dyspnea are often associated with tumor progression [11]. Teratomas may present with several complications, such as respiratory

distress, hemorrhage, pneumothorax, or fistula formation into the aorta, the esophagus, or the bronchus [12].

When diagnosing and monitoring mediastinal germ cell cancers, serum tumor markers such as HCG and AFP must be determined. This is important since benign teratoma patients do not show elevated tumor markers, which aid in differentiating between malignant and immature teratomas [13]. CXR is the first imaging modality used to diagnose mediastinal teratomas. The next step in evaluation is a CT scan, which determines the type, location, and relationship of the tumor to adjacent structures. Magnetic resonance imaging has recently demonstrated better diagnostic accuracy than CT scans, especially when it comes to detecting tumor invasion of the capsule and surrounding structures [14]. The histopathological examination gives the definitive diagnosis. The differential diagnosis includes hydatid cyst, fungal ball, lung abscess, and lung parenchymal tumor [15]. Complete surgical excision with delicate separation from the surrounding tissue is the treatment of choice for benign mediastinal teratoma [16].

CONCLUSION

The complete removal of mature teratoma poses a challenge when strong adhesions to vital mediastinal structures occurs. Careful surgical planning and approach must be customized according to the size and extent of the mediastinal tumor to provide adequate exposure, safe dissection, and removal of the mediastinal tumor.

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