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Case Report

Unusual presentation of giant mature mediastinal teratoma in a young child: A case report ☆,☆☆

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ABSTRACT

Mature mediastinal teratoma is a rare benign tumor in children. Few cases have been reported in the literature. Moreover, this tumor is often characterized by slow growth, reaching a large volume and frequently causing nonspecific symptoms, making its diagnosis more difficult. It raises the question of differential diagnosis with malignant mediastinal tumors in pediatric patients, requiring histological confirmation by biopsy or excision. The purpose of this article is to report an atypical clinical finding characterized by spinal deformity, and to contribute to medical knowledge concerning this uncommon pediatric tumor.

Introduction

Mediastinal mature teratoma is a rare benign neoplasm in the pediatric age group. Few series have been published. Clinical presentation is determined by size and mass effect. Children may present with a wide range of symptoms due to its location, including respiratory complaints, chest pain and nonspecific symptoms such as spinal deformity. Conversely, some patients are asymptomatic and diagnosed incidentally. Contrast computed tomography of the chest suggests the diagnosis. Surgical resection is the primary treatment but it can be challenging due to proximity of major thoracic structures. This tumor has an excellent prognosis with a high long-term survival rate.

Case report

A healthy 10-year-old female child presented with a 4-year history of dyspnea on exertion and progressive spinal deformity, without fever or additional respiratory symptoms. Upon examination, she exhibited no signs of respiratory distress,

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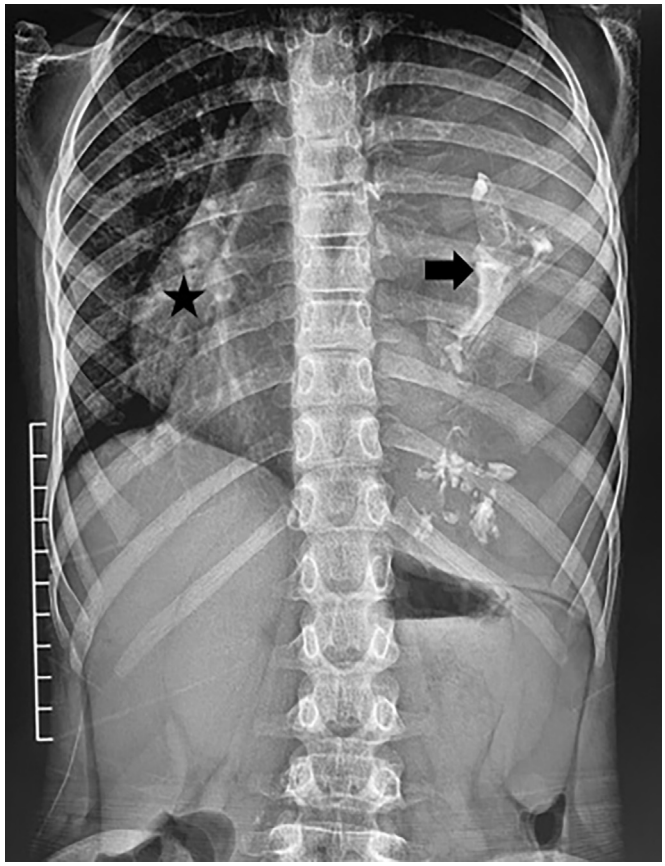

Fig. 1 – Chest X-ray pre-op revealed a giant opacity in the left hemithorax containing unusual amorphous calcifications (black arrow) and causing a cardiomediastinal shift to the right (black star).

but diminished breath sounds were noted in the left lung field, particularly at the base, along with dullness on percussion. Chest X-ray revealed a large opacity in the left hemithorax containing unusual amorphous calcifications and causing a rightward cardiomediastinal shift (Fig. 1). Contrast-enhanced chest computed tomography showed a giant, well-defined, encapsulated mass measuring 135 × 150 × 197 mm in the anterior mediastinum. The mass exhibited soft-tissue density, cystic areas, and calcifications, with heterogeneous enhancement after contrast administration, consistent with a teratoma (Fig. 2). The lesion extended beyond the midline into the retrocardiac region, further displacing the left lung, which appeared hypoplastic and compressed. Additionally, the thymus was displaced to the right. Biological investigations revealed a normal complete blood-count and biochemistry profile, as well as negative levels of alpha-fetoprotein (AFP) and beta-human chorionic gonadotropin (B-HCG).

A Left lateral thoracotomy at the fifth and sixth intercostal spaces was performed, exposing a large mass in the anterior mediastinum adherent to the thymus and adjacent to the pericardium, causing atelectasis of the left inferior lobe. During tumor resection, an inadvertent rupture occurred, leading to spillage of contents, promptly aspirated. Meticulous blunt dissection allowed for phrenic nerve preservation, and complete excision of the tumor along with a part of the thymus was achieved (Fig. 3). A 20-French chest tube was placed in the pleural space and the chest was closed. Postoperative course was uneventful, with extubation on the first postoperative day. A chest X-ray performed on the second postoperative day showed resolution of the anterior mediastinal mass without pleural effusion. The chest tube was removed 48 hours later. The patient was weaned to room air and discharged after 5 days.

Histological examination of the specimen revealed a solid-cystic mass containing multiple randomly distributed tissue components. Some areas were lined with regular malpighian epithelium containing sebaceous and sweat glands (Fig. 4A), alongside adipose lobules and regular muscular bundles (Fig. 4B), as well as osseous tissue and occasional foci of glial tissue (Fig. 4C). No immature areas or signs of malignancy were identified. These findings confirmed the diagnosis of a mature teratoma with thymic tissue found on the periphery of the mass. After 2 years of follow-up, the patient remains asymptomatic with no evidence of recurrence (Fig. 5).

Discussion

Mediastinal teratomas are extremely rare tumors in children, comprising only 3% of pediatric germ cell tumors and 5%-10% of pediatric mediastinal tumors [1]. The scarcity of published

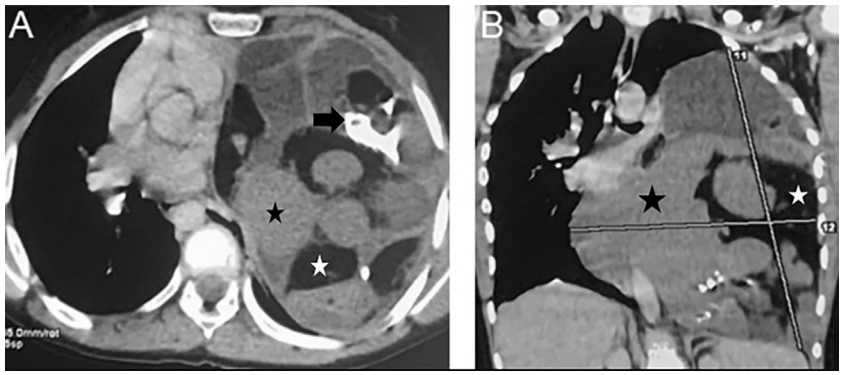

Fig. 2 – Contrasted chest computed tomography (A: axial section, B: coronal reconstruction) revealed a giant anterior mediastinal mass, with soft-tissue density (black star), cystic areas (white star) and calcifications (black arrow).

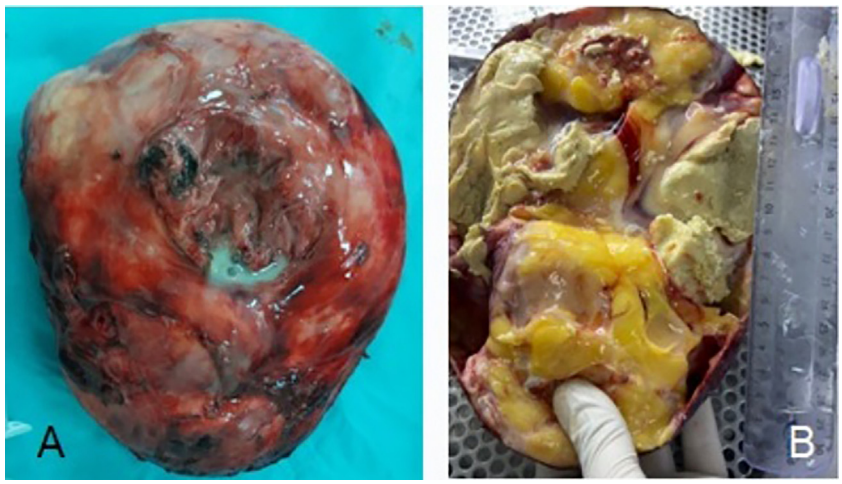

Fig. 3 – Intraoperative photograph showing: (A) Encapsulated removed mass. (B) Gross cystic and solid tumor components.

patient series confirms their uncommon occurrence. Mostly located in the anterior mediastinum, they originate from the thymic gland or, exceptionally, from ectopic thyroid tissue. Their presence in the posterior mediastinum is exceptional [2], where they may assume a paravertebral position, posing a differential diagnosis challenge with neuroblastoma or lymphoma [3].

These lesions manifest diverse clinical and histological presentations. Frequently, patients remain asymptomatic, and the tumor is incidentally discovered during a routine chest radiography performed for other indications. In symptomatic cases, clinical signs are related to its size and compression of adjacent structures. Patients may present with chest pain, dyspnea, hemoptysis, or nonspecific symptoms such as spinal deformity, as observed in our case.

Initial diagnostic evaluation for a mediastinal mass is usually a chest X-ray. The radiological appearance of mature teratoma differs depending on its composition. Cystic teratomas appear as an opacity with sharply rounded, well-circumscribed borders, while solid teratomas exhibit lobulated and irregular contours. Intralesional calcifications are nonspecific [4]. In our case, calcifications were present. Computed tomography (CT) is the preferred imaging modality for both diagnosis and treatment planning. This technique can elucidate potential mass effects and assess invasion into adjacent anatomical structures. Mediastinal teratomas typically manifest as round or lobulated masses containing soft tissue, fluid, fat, and calcifications [5]. Magnetic resonance imaging (MRI) shows masses with heterogeneous signal intensities consistent with fluid in 88% of tumors and with fat in 63% of tumors [6].

These tumors are generally considered benign; however, they may contain benign and malignant elements revealed on microscopic examination. Malignant transformation is extremely rare [7]. Surgery is the standard treatment. Performing a complete resection is highly recommended and determines the prognosis which is very favorable. The choice of operative approach, whether via median sternotomy or lateral thoracotomy, should be carefully planned based on preoperative imaging. Surgical procedures may involve conventional open laparotomy or thoracoscopy [8]. Resection of giant mediastinal tumors presents several challenges for surgeons, including the potential risk of cardiovascular collapse and damage to adjacent anatomical structures due to their close proximity and potential adherence to major organs, vessels, and nerves, complicating the surgical procedure.

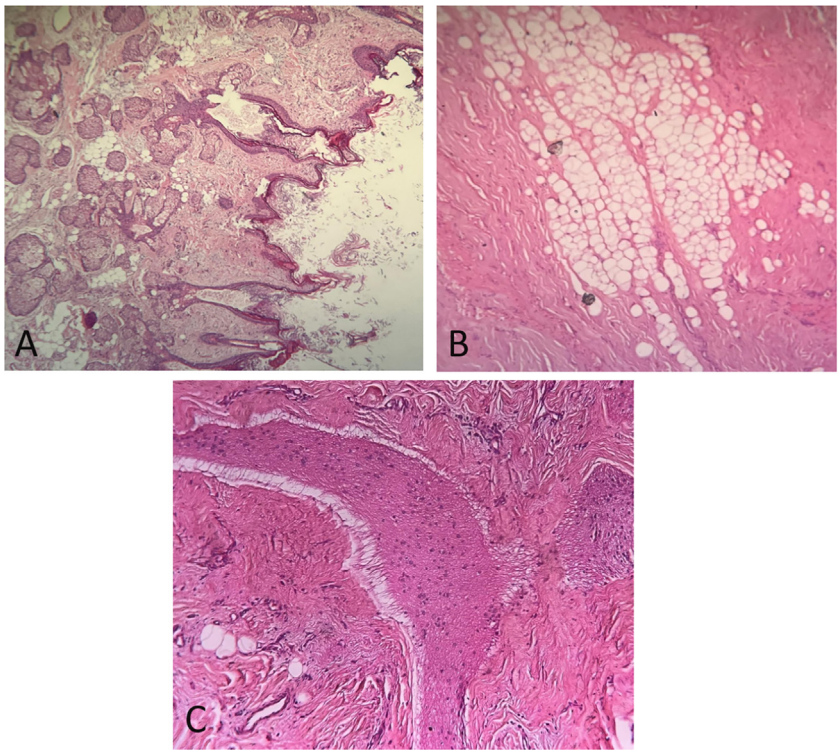

Fig. 4 – Pathological findings. (A) Malpighian epithelium containing sebaceous and sweat glands. (B) Adipose lobules and regular muscular bundles. (C) Foci of glial tissue.

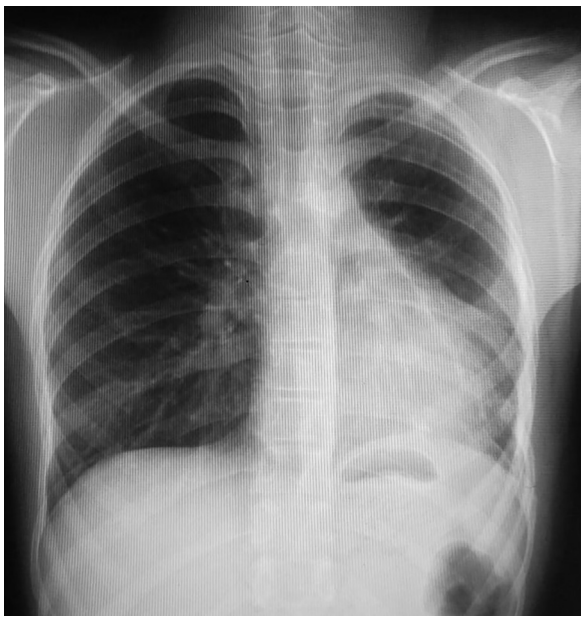

Fig. 5 – Chest X-ray at 24 months of follow-up.

Conclusion

Giant mature mediastinal teratoma is a rare entity in children and should be considered as a differential diagnosis in patients with scoliosis or chest deformity. This emphasizes on the importance of performing detailed radiological investigations to establish an appropriate diagnosis and ensure an optimal treatment. Early and complete surgical resection offers the best possible prognosis and prevents further complications. However, giant tumors pose unique challenges during resection due to their proximity to nearby structures.

Patient consent

Written informed consent was obtained from the patient's parents (legal guardian) for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

REFERENCES

[1] Kebalo SP, Lamboni D, Guedenon KM, Amegbor K, Gnassingbe K. Mature teratoma of the mediastinum in children: a case revealed by persistent chest pain. J Pediatr Surg Case Rep 2022;78:102209. doi:10.1016/j.epsc.2022.102209.
[2] Ranaldi R, Morichetti D, Goteri G, Martino A. Immature teratoma of the mediastinum arising in ectopic thyroid tissue: a case report. Anal Quant Cytol Histol 2009;31:233–8.
[3] Haloua M, Bouardi NE, Hbibi M, Alami BE, Lamrani YA, Hammas N, et al. Posterior mediastinal teratoma presenting

as an abdominal mass in a child: a case report. Radiol Case Rep 2022;17:3825–9. doi:10.1016/j.radcr.2022.07.067.
[4] Liu J, Tian B, Zeng Q, Chen C, Zhou C, Li H, et al. Mediastinal teratoma presenting with hemoptysis and pleuritis misdiagnosed as tuberculosis (empyema). BMC Pediatr 2018;18:382. doi:10.1186/s12887-018-1357-7.
[5] Wu T-T, Wang H-C, Chang Y-C, Lee Y-C, Chang Y-L, Yang P-C. Mature mediastinal teratoma: sonographic imaging patterns and pathologic correlation. J Ultrasound Med 2002;21:759–65. doi:10.7863/jum.2002.21.7.759.
[6] Moeller KH, Rosado-de-Christenson ML, Templeton PA. Mediastinal mature teratoma: imaging features. Am J Roentgenol 1997;169:985–90. doi:10.2214/ajr.169.4.9308448.
[7] Bouassida I, Ayed AB, Ouhichi S, Saad A, Zairi S, Marghli A. A huge mediastinal teratoma in a 14-year-old girl. Int J Surg Case Rep 2023;113:109003. doi:10.1016/j.ijscr.2023.109003.
[8] Carannante F, Frasca L, Marziali V, Longo F, Crucitti P. Giant mature teratoma in thymic tissue removed with uniportal vats approach. Int J Surg Case Rep 2020;66:143–5. doi:10.1016/j.ijscr.2019.11.031.