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Incidentally Diagnosed Mediastinal Mature Teratoma in an Infant: About A Case Report and Literature Review

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Abstract **Case Report**

Mature teratoma accounts for 75% of germ cell tumors of the mediastinum, including 6 to 18% of tumors of the anterior mediastinum in children. The risk of malignancy of this benign tumor is exceptional. Respiratory and cardiac symptoms are its mode of revelation due to the mass effect on the adjacent mediastinal structures. We report the case of a 4-month-old male infant with an anterior mediastinal mass found during a cardiac ultrasound as part of a heart murmur assessment. The rest of the clinical examination was normal. The chest CT scan highlighted an anterior mediastinal mass with a fatty, cystic, and tissue component developed at the expense of the right part of the thymus without compression of adjacent structures. Tumor markers were negative. The lesion was excised by right lateral thoracotomy. The pathological analysis favored a mature teratoma. No complications or recurrences occurred after a 21-month follow-up. Mature thoracic teratoma is a rare benign tumor in the pediatric population. Its diagnosis is most often incidental or evoked in case of chest symptoms. Complete surgical excision of this tumor results in complete healing without risk of recurrence.

Keywords: Mediastinal teratoma, thoracotomy, child, case report.

INTRODUCTION

Mature teratoma accounts for 75% of germ cell tumors of the mediastinum, including 6 to 18% of tumors of the anterior mediastinum in children [1]. The risk of degeneration of this benign tumor is exceptional. Respiratory and cardiac symptoms are its mode of revelation due to the mass effect on the adjacent mediastinal structures. Radical treatment is surgical excision leading to complete recovery without chemotherapy. Our work aims to report our experience with an exhaustive literature review.

CASE PRESENTATION

A 4-month-old male infant was referred by his pediatrician for the incidental discovery of an intrathoracic mass during a cardiac ultrasound for a cardiac murmur. It was closely related to the proximal aorta, the right atrium, the right ventricle, and the superior vena cava. A chest CT scan showed a cystic structure measuring 9 cm x 6.5 cm x 5 cm with a thick wall at the right side of the thymus, with heterogeneous content, contrast enhancement, and no vascular compression (Figure 1a, b). The tumor markers were negative. A right anterolateral thoracotomy in the fifth intercostal space allowed the excision of a mass adhering to the right edge of the thymus with a vascular pedicle (Figure 2). Two chest drains were placed, one apical and the other basal. The postoperative follow-up was uneventful, with the chest drains removed on postoperative Day 2 (POD 2) and the patient discharged home on POD 5. The pathological analysis confirmed the diagnosis of mature teratoma (Figure 3a, b). After 21 months, no recurrence was noted (Figure 4).

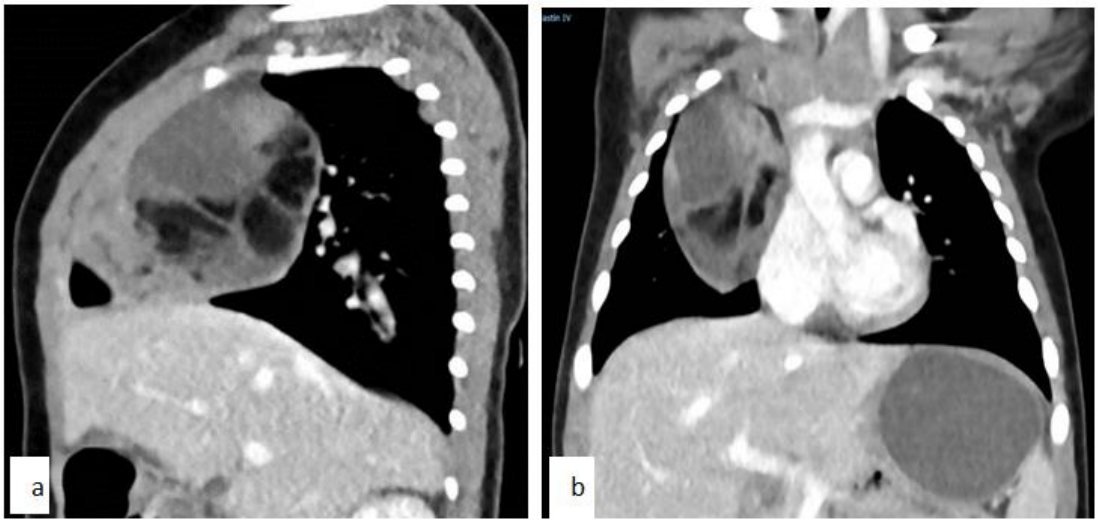

Figure 1: Chest CT scan showing the anterior thoracic location of the tumor, which is cystic and heterogenous (a. sagittal view; b. frontal view)

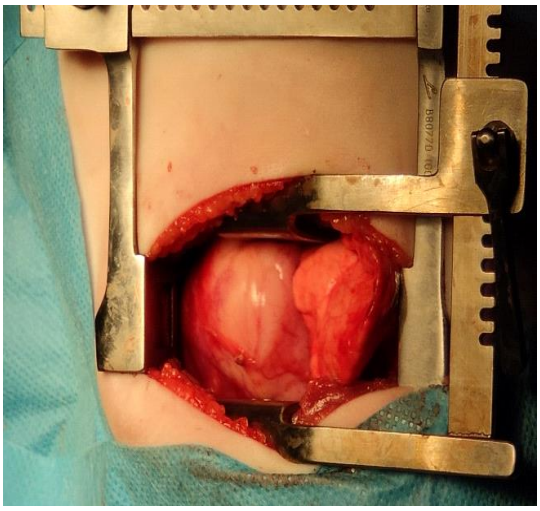

Figure 2: Intraoperative appearance of the tumor occupying the anterior mediastinum

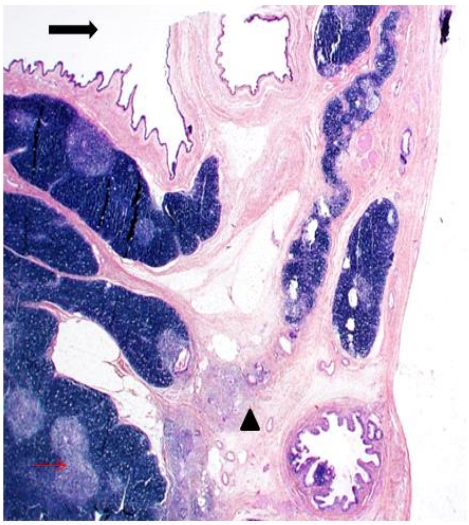

Figure 3a: HES staining with low magnification Thymus (red arrow) site of a partially cystic lesion (Black arrow) and with several structures (Black triangle)

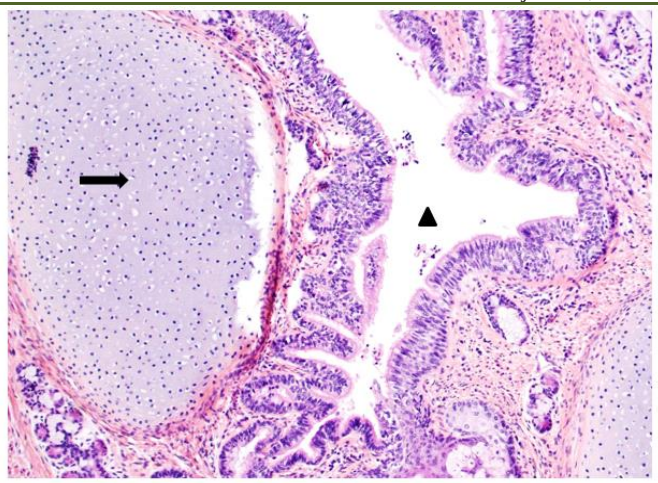

Figure 3b: HES staining with higher magnification mesoderm (Black arrow) and endodermal tissues (Black triangle)

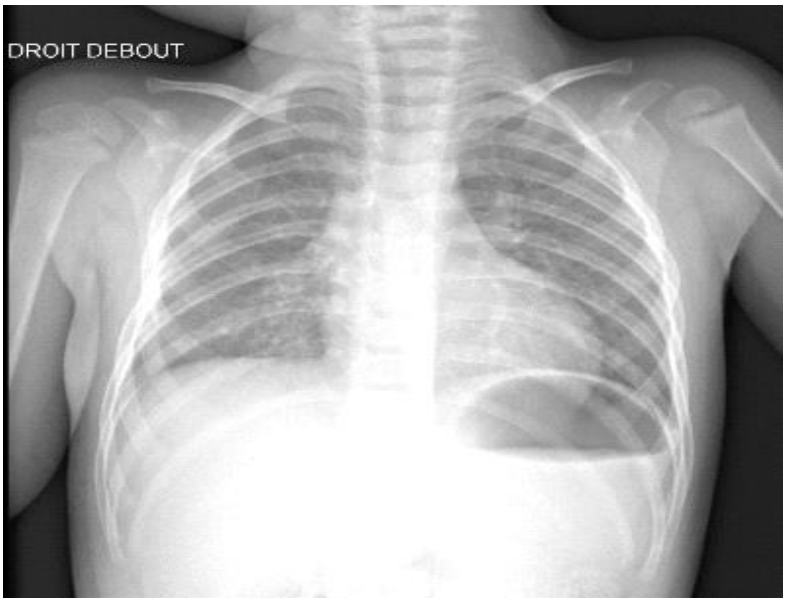

Figure 4: Chest X ray at 1 year postoperative

Table 1: A literature review of a few studies

Authors	**Case**	**Age**	**G**	**Clinical presentation**	**Tumor markers**	**Surgical approach**	**Mediastinal**	**Size (cm)**	**Histology**	**HS**	**Complicatio**
Our patient France, 2020	**1**	**4 m**	**M**	**Cardiac murmur**	**Decreasing AFP levels; HCG and LDH negative**	**Right thoracoto my**	**Anterior**	**9x6,5x5**	**Mature**	**5**	**None**
Khalood [2] Saudi Arabia, 2017	1	5 y	M	Foreign body ingestion	Negative	Right thoracoto my	Anterior	5x4x2	Mature	13	None

Authors	Case	Age	G	Clinical presentation	Tumor markers	Surgical approach	Mediastinal	Size (cm)	Histology	HS	Complicatio
Codric [5] Italy, 2012	1	4 y	F	Bronchopneumonia	Negative	Thoracoscopy	Anterior	4x4x9	Mature	3	None
Stajevic [6] Serbia, 2019	1	2 y	F	Neonatal respiratory distress	Unknown	Sternotomy	Anterior	Unknown	Immature	30	Phrenic
Liew [7] Malaysia, 2015	1	12y	M	Chronic cough	Negative	L-shaped incision	Anterior	11,2x9,9 x14	Mature	9	None
Ba [1] Senegal, 2010	1	15 y	M	Dyspnea	Negative	Right thoracotomy droite	Anterior	6	Mature	8	None
Yokoyama [8] Japan, 2013	1	11 y	F	Cough	Negative	L-shaped incision	Anterior	13	Mature	10	None

G: gender; **cm:** centimeters; **HS:** hospital Stay (days); **m:** months; **M:** male; **F**: female; **y**: years; **h:** hours of life

DISCUSSION

Derived from the Greek word "*terato*," which means "*monster*," and "*onkoma*," which means "*bulky*," teratoma is a germ cell tumor that develops from pluripotent cells derived from the three embryonic layers (endoderm, mesoderm, and ectoderm) [2]. Two forms are described: mature, benign, and immature, malignant. 68.5% of teratomas are mature in children, the thorax being the fourth most affected site after the ovaries, testes, and sacrococcyx [1, 3]. In addition, thoracic teratoma usually develops in the anterior mediastinum in 75% of cases, in contact with the thymus [1-3]. It affects both boys and girls without gender predominance [4]. In infants and newborns, thoracic teratoma is asymptomatic in 60% of cases and diagnosed incidentally on chest x-ray or routine imaging during pregnancy [2]. Our patient is one of the youngest cases described in the literature (Table 1). Respiratory and cardiac symptoms are the most frequent mode of revelation due to the mass effect on the adjacent mediastinal structures, as reported in our case. Khulood *et al*., describe an incidental finding on a chest x-ray indicated for ingestion of a foreign body [2], while Codrich *et al*., diagnosed it during bronchopneumonia [5] and Stajevic *et al*., at the 2nd hour of life in a neonate with respiratory distress [6]. Due to its location in the anterior mediastinum, possible differential diagnoses are thymoma, lymphoma, thyroid cyst, and dermoid cysts [2, 5, 7]. Most authors agree that the chest CT scan is the best diagnostic modality in case of a thoracic lesion. Mature teratoma appears as a well-circumscribed, heterogeneous, partitioned mass made of fatty tissue and calcifications, with a thick wall enhanced upon injection of the contrast product [1]. MRI is performed if there is a contraindication to the injection of the contrast product [5, 7, 8]. Biological investigations such as tumor markers levels, namely Alpha-fetoprotein (AFP), Human Chorionic Gonadotropin (HCG,) and Lactate Dehydrogenase (LDH), must be obtained before setting up treatment. The negativity or decrease of these markers on at least two successive samples would favor a benign tumor [7, 8]. Complete surgical excision without neoadjuvant chemotherapy remains the treatment for mature thoracic teratoma [2, 5, 8]. The approach depends on the size and location of the mass in the mediastinum. As Khalood *et al*., did, we performed an anterolateral thoracotomy on our patient [2]. Stajvic instead favored sternotomy [5]. Liew *et al*., opted for an extended sternotomy with a thoracotomy (L-shaped incision) [7]. Thoracoscopy is possible for small benign tumors, according to Codric *et al*., [5]. The anatomopathological analysis of our operative specimen confirmed the diagnosis of a mature teratoma with the presence of skin, cartilaginous, bronchial tissue, and a dental bud. Besides, the completeness of the excision ensures the absence of recurrence. Our patient's length of stay was five days; this result is superior to that of Codric *et al*., [5], who had noted two days of hospitalization in their patient treated by thoracoscopy.

Complications are dominated by phrenic nerve injury, reported in 16% of cases in the literature [9]. Only Stajevic *et al*., reported this complication in their patient [6]. With a follow-up of 21 months, our patient is doing well, and we have not recorded any recurrence.

CONCLUSION

Mature thoracic teratoma is a rare benign tumor in the pediatric population. Its diagnosis is most often incidental or evoked in case of chest symptoms. A Chest CT scan is essential for the diagnosis. Complete surgical excision of this tumor results in complete healing without risk of recurrence.

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