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Mediastinal Teratoma: Unusual Location and Mode of Disclosure

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Abstract

A 5 year-old girl patient without any health history, presented a persistent cough, dyspnea, hemoptysis and fever. Physical examination showed a bronchial airway sound abolition and dullness in lower of right lung. We report the long diagnostic and therapeutic course for this child presenting a teratoma of the mediastinum with postero-inferior location having evolved well after surgical excision. To sum up, anterial mediastinal teratomas are common tumor, but the postero-inferior location is rare. Basically, clinical signs are not specific. Anyway, an infectious syndrome should not overshadow other etiologies.

Keywords

Teratoma, Mediastinium, Pneumonia, Pleural Infusion

1. Background

A teratoma is a germ cell tumor that can occur anywhere in the body. In the mediastinum, teratomas most commonly occur in the anterior middle mediastinum [1] [2]. Common chest symptom and sign may be seen in mediastinal teratoma. Such might be a chest pain, cough, rarely, hemoptysis. In other way, it may be discovered incidentally during a pre-employment chest X-ray [1] [2]. The age at diagnosis ranges from infancy to adulthood [3]. We report here a case of a posterior-inferior mediastinal teratoma detected during an evaluation of hemoptysis in a patient with prolonged fever and review, through the literature, the various aspects of this rare pathological entity.

2. Case Report

A 5-year-old girl presented at doctor's office for mild hemoptysis that had been

developing over a month. This hemoptysis is occurred within 3 months of hospitalization in pediatric department due to pulmonary disease. This lung illness had been known from 16 months. Symptoms and signs started at 3 years and 6 months of age, with a cough, shortness of breath, and fever. First of all, a pediatrician diagnosed an acute bronchitis. She underwent amoxicillin and cough syrups as treatment. The child reportedly showed partial improvement for 3 months. Then, a second visit to a pediatrician's office had been made, due to the same symptoms and signs. A chest X-ray was performed. It showed a homogeneous and dense opacity in the third lower right lung, surmounted by a small radiologic clarity (**Figure 1**). Blood tests showed a normal white blood count and a CRP of 48 mg/dL. Mycobacterium tuberculosis screening test on sputum smear, using the GeneExpert system was negative. The pediatrician diagnosed a acute and communautary pneumonia, and readmitted her in Pediatric department. The empirical parenteral antibiotic therapy (cefotaxime and gentamicin), oxygen therapy, and symptomatic treatment were used for two weeks. The child discharged with partial improvement without a follow-up chest X-ray. Six months later, the child had been experiencing another respiratory decompensation with worsening dyspnea and cough. The subsequent chest X-ray (**Figure 2**) showed in right lung, a homogeneous, dense and round opacity, surmounted by a radiologic clarity with

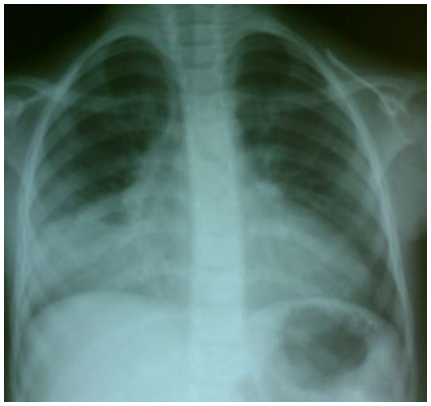

Figure 1. Chest X-ray in December 2023.

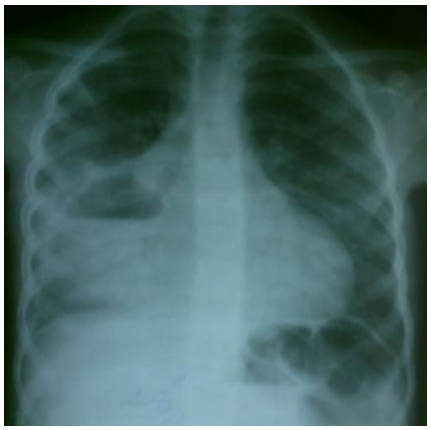

Figure 2. Chest X-ray in May 2024.

a clear air-fluid level. Therefore, she was readmitted in hospital for a lung abscess treatment. Empiric antibiotic therapy combining cefotaxime and metronidazole was used for three weeks without clinical nor radiological improvement. Yet, the pediatrician suspected a right pachypleuritis even though chest CT scan was not performed. Anyway, a right thoracotomy is performed. Nevertheless, she child discharged from the hospital with a partial improvement with oral amoxicillin + clavulanic acid for ten days. Faced of this lack of improvement in symptoms and signs, she consulted several pediatricians over four months, and received many different medications.

In spite of this medication, she was finally readmitted in pediatric department at 13th month due to a worsening dyspnea, cough and fever. At that time, the white blood cell count was 15,000/mm^3 with a predominance of neutrophil polynuclear cells (80%) and a CRP of 96 mg/dL. Blood cultures remained sterile. The tuberculosis test, using Gen-Expert system was again, negative. The standard chest X-ray showed an increase in the size of the right-sided round opacity, with the right lower lobe airway seen around. The right border of the heart was disappeared, a right costophrenic space was free (**Figure 3**). The pediatrician again diagnosed and treated a acute infectious pneumonia despite history of the lung disease. The child was hospitalized for the third time. She was treated with numerous antibiotics, including imipenem and vacomycin, oxygen, and antipyretics for three months, but she never improved. Given the persistence of the symptoms, complicated of hemoptysis, yet, the child was transferred to a pediatric pulmonologist.

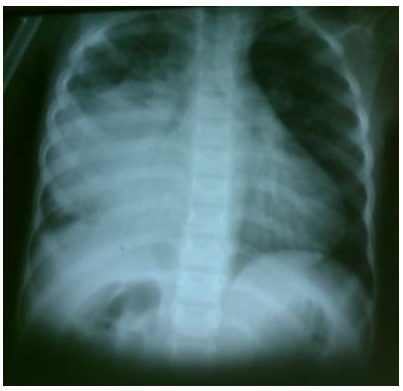

Figure 3. Chest X-ray in January, 2025.

The physical examination by this doctor noted a weight of 15 kg (−1 SD), an SaO2 of 97% on room air and at rest, dullness and absence of breath sounds in the lower two-thirds of the right lung, and a right thoracotomy scar. In light of the progression of the disease and the patient's medication history, a chest CT scan was performed. It showed thoracic asymmetry with a tumor in right lung space with 10.5 × 7.5 × 8 cm of measurations. This tumor contained multilobulated cystics with fluid content, and parietal calcification in two areas. This mass was displacing the surrounding anatomical structures (**Figure 4(a)** and **Figure 4(b)**), with compression of the right main bronchus, associated with right subclavicular

opacity, with air bronchogram. It extended from the postero-inferior mediastinum towards the right hemithorax.

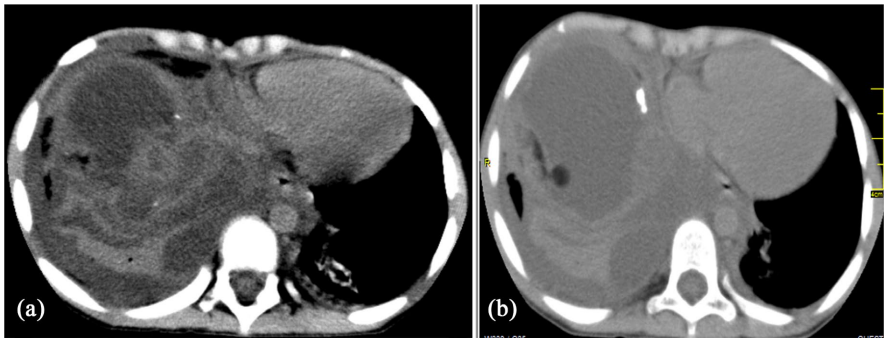

Figure 4. A preoperative chest CT scan showing a multilobed tumor containing fluid with foci of calcification, displacing adjacent organsm performed in March 2025.

Based on the appearance of the chest CT scan, a diagnosis of mediastinal teratoma with mass effect was suspected, and surgery was indicated. Lack of a local facility to perform the surgery, the child was transferred to the University Hospital of Montpellier. In addition to the chest CT scan performed before the transfer abroad, a pre-operative check up was carried out to confirm the diagnosis and to determine the patient's fitness for anesthesia and surgery. It involved reviewing medical history, a physical exam and tests. Foeto Protein alfa and β-hCG levels were measured, but the results are not available.

Then, the child underwent surgery via a sternal approach (sternectomy). Complete resection of the mass was performed. The three lobes of the right lung remained intact. This mass developed from the postero-inferior mediastinum. Anatomopathological reading of the mass found a keratinized squamous epithelium of cutaneous type, most often remodeled by inflammatory infiltrates predominantly of histiocytes with foamy cytoplasm, and quite a few multinucleated giant cells. This indicated areas of rupture. This was directly connected to the hemoptysis. In places, this epithelium is overlain by dermal-type fibrous tissue rich in hair follicles, and by sparse, mature hypodermal-type fibroadipose tissue. Within the thickness of the wall, other derivatives of the three embryonic germ layers are found, particularly exocrine and endocrine pancreatic tissue, respiratory epithelium, digestive mucosa, complete thymic tissue, and several cartilage islands. All these tissues exhibit complete histological maturation without any malignant features.

Indeed, the diagnosis of a mature teratoma of the postero-inferior mediastinum was therefore confirmed after a surgery and an anatomopathological examination of the tumor.

The surgery was followed by physiotherapy focusing on posture and alveolar ventilation of the right lung. The postoperative course was excellent, with the disappearance of all clinical signs and symptoms, weight regain, and complete re-expansion of the entire right lung (**Figure 5**). Clinical progress is excellent, both in terms of general health and respiratory function.

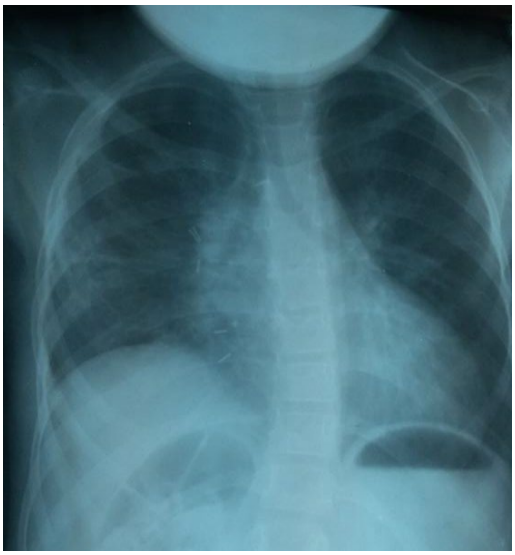

Figure 5. Chest X-ray done one month after the surgery.

3. Discussion

Mature teratomas are the most common germ cell tumors. Their mediastinal location is rare, accounting for 10% to 15% of all mediastinal tumors. The most common site is the anterior-middle mediastinum. In our case, the tumor was located in the posteroinferior mediastinum. This location is extremely rare. Teratomas generally grow slowly [1] [2]. Consequently, they typically become clinically symptomatic between the ages of 30 and 40 [3]. Earlier or later onset is also possible [4]. This was the case for this 5-year-old girl.

Mediastinal teratomas are often discovered incidentally. They are occasionally detected during chest imaging performed for other reasons [1] [5] [6]. When it becomes symptomatic, the teratoma may present with symptoms related to compression of neighboring organs, such as chest pain, dyspnea, and pleural effusion, or with signs of rupture into a hollow space in 36% to 40% of cases [5] [6]. This rupture is generally responsible for prominent symptoms such as chest pain, hemoptysis, dyspnea, and mucus-producing bronchorrhea that may contain hair [5] [6]. Acute respiratory distress is also possible [5]. The infectious syndrome appears to occur only in the event of a parenchymal superinfection facilitated by lung compression. All of these clinical features were present in our patient.

The histological heterogeneity of the teratoma, characterized by the presence of exocrine and endocrine secretory cells—such as those from the pancreas, gastrointestinal tract, and lung—is thought to play a significant role in its rapid growth and in its rupture due to enzymatic lysis of its wall [7]. Hemoptysis is one of the signs suggestive of this rupture. However, hemoptysis is a rare sign in pediatrics. When this sign appears, particular attention should be directed toward rare etiologies, including teratoma rupture.

The initial tests (complete blood count, C-reactive protein, standard chest X-ray) in this child showed a homogeneous and dense opacity with an area of clarity

within it, which would initially suggest bacterial pleuropneumonia given its prevalence and the associated signs of infection. Indeed, empirical antibiotic therapy was a reasonable approach. In the absence of improvement, other etiologies—including a teratoma—should have been considered, and additional tests should have been ordered without waiting 16 months for the condition to evolve. This would have spared the child and the family an unnecessary thoracotomy and unnecessary suffering.

Chest imaging plays a crucial role in the diagnosis of a teratoma [7]. A chest X-ray reveals an intrathoracic opacity. A chest CT scan with contrast injection clarifies the borders and morphology of the mass. MRI provides greater detail regarding the borders and morphology and, above all, the relationship of the mass to other organs [7]. In this child, it was the results of the chest CT scan—showing, among other things, parietal calcification—that guided the diagnosis.

As for treatment, surgery remains the standard approach, involving complete excision as long as the teratoma can be removed. This surgery must be supplemented by respiratory rehabilitation to improve the patient's lung capacity and correct their posture.

4. Conclusion

The symptoms of a mediastinal teratoma are far from specific. However, the persistence of signs of infection with an intrathoracic opacity despite appropriate empirical antibiotic therapy should prompt further investigation to clarify the diagnosis and initiate specific treatment.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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