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Rare mediastinal thymic cyst infection without predisposing disease: a case report

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Introduction

This manuscript highlights a very rare complicated thymic cyst case with unique features different from the medical literature. Thymic cysts are cystic lesions accounting for 3.7% of all mediastinal masses; they are typically diagnosed in adults (29 cases out of 30 reported by Takeda et al.). They occur mostly in the anterior mediastinum.[1,2]

Thymic cysts may be congenital or acquired. Acquired cysts may have several pathogeneses such as infection or neoplasm.[3–6] Acquired cysts are mostly multiloculated, whereas congenital cysts could be unilocular or multilocular; therefore, unilocular cysts are mostly congenital.[3–5,7,8] Usually, patients remain asymptomatic.[1,2]

Thymic cyst and infection occasionally coexist, and when they do, it is typically associated with specific types of infections such as tuberculosis or HIV.[4,5,9]

In this paper, we report a case of 22-month-old girl presenting with respiratory distress without previous upper respiratory tract infection or underlying predisposing conditions, which turned out to be an infected thymic cyst.

Case report

A full-term, 22-month-old girl was admitted to the hospital with complaints of dyspnea, cough and mild fever, which started two weeks ago. She had no previous episode of upper respiratory infection. She presented with a wheezing episode a year earlier, which responded well to bronchodilators and did not recur. Otherwise, she had an unremarkable medical, surgical or familial history.

Physical examination revealed severe dyspnea (respiratory rate: 52 r/min), central cyanosis (O_2 saturation: 87%) and fever of 39. Abdominal examination was normal. Cardiovascular examination showed a heart rate of 160 bpm without any abnormal heart sound. The auscultation revealed diminished breath sounds all over the right chest.

Laboratory tests showed C-reactive protein levels of 19.1 mg/L, white blood cell count of 10.79/L, haemoglobin levels of 10.2 g/dL and otherwise normal findings.

A following chest X-ray revealed increased cardiothoracic ratio and areas of increased density in the middle and lower right lobes which raised the suspicion of pneumonia (Figure 1).

Cardiac ultrasonography revealed clear large-amount pericardial effusion as well as a mass right and above the heart without any connection to the heart.

Since the chest X-ray and cardiac ultrasonography did not specify any lesion, we ordered a chest computed tomography. Computed tomography scan revealed a unilocular cystic mass in the right anterior mediastinum above the heart which raised the suspicion of a tumour (Figure 2).

We measured tumour markers including Alpha-Feto Protein and Beta Human Chorionic Gonadotropin, and they were within normal ranges. The pathological examination of pleural and pericardial effusions revealed acute inflammatory infiltrate without tumour cells so we put the patient on antibiotics.

We decided then to perform surgery to resect the cystic mass. A thoracotomy with a fourth intercostal incision exposed the cyst inside the thymic gland. The cyst was resected and specimens were sent for pathological examination. The patient then had a cardiorespiratory deterioration which required ventilation support for two days. After that, her vital signs improved. The following chest X-ray and cardiac ultrasound returned to normal and she was discharged with a stable condition.

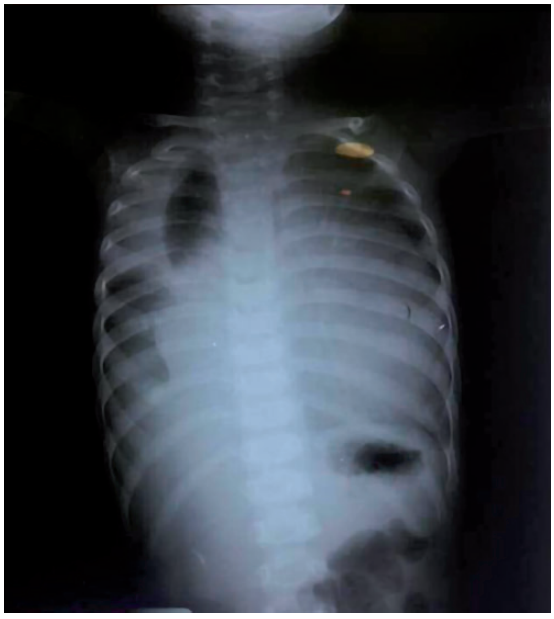
Pathological examination of the resected cyst revealed thymic cyst with neutrophil-infiltrated wall (Hassal bodies were not evident probably due to the vigorous decortication of the cyst). We stained the

specimen with Gram stain which showed a Gram-positive cocci in the wall of the cyst which confirmed the diagnosis of an infected thymic cyst (Figure 3).

Discussion

The thymus gland is located in the anterior mediastinum. Different lesions may originate from the thymus gland such as thymomas, thymic carcinomas, thymic hyperplasia, thymolipomas, thymic cysts, etc. One of the thymic gland lesions is thymic cyst accounting for 3.7% of all mediastinal masses. The anterior mediastinum is the most common location for thymic cysts. However, they can be located elsewhere especially in the neck.[1,3]

Figure 1. A chest X-ray revealing a pleural effusion with increased densities in the right chest.



Thymic cysts may be congenital or acquired. Acquired cysts may result from different pathogeneses such as neoplasm (e.g. Hodgkin's lymphoma) or its treatment, infection (e.g. HIV and tuberculosis) or posthoracotomy.[3–6,9,10]

Thymic cyst and infection occasionally coexist, and when they do, it is typically associated with specific types of infections such as tuberculosis or HIV; these cysts are mostly multiloculated.[4,5,9]

Usually, cysts remain asymptomatic, but when they present with symptoms, they are typically due to the mass effect.[2] Presentation due to an infection of a preexisting thymic cyst in the mediastinum is very rare; upon searching the medical literature, we only found one case resembling this clinical entity.[11]

Regarding our patient, clinical, radiological and pathological findings excluded tuberculosis, HIV and other commonly associated conditions.

In our case, many factors such as the age, the absence of the typical associated conditions, the mediastinal location, the infection and the unilocular type of the cyst which indicated the congenital origin, made this case a very rare clinical entity and a diagnostic challenge. Clinical and radiological findings were not specific at all, which made surgery and

Figure 2. (a) A transverse computed tomography scan image of the chest showing an anterior mediastinal unilocular cystic mass with evident borders. (b) A coronal computed tomography scan image showing the cyst.

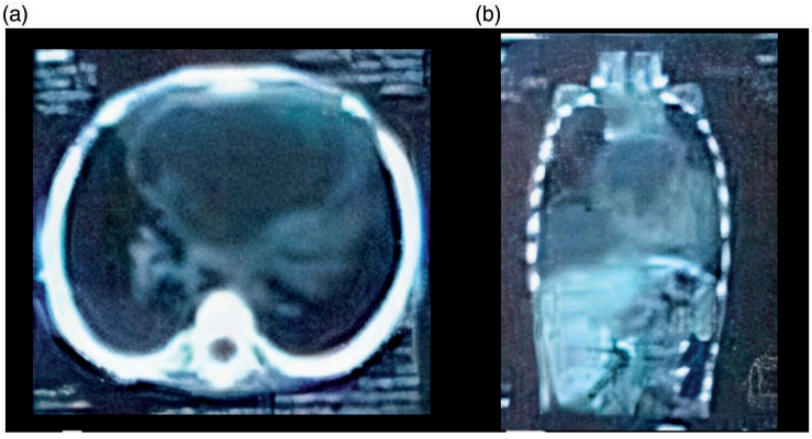
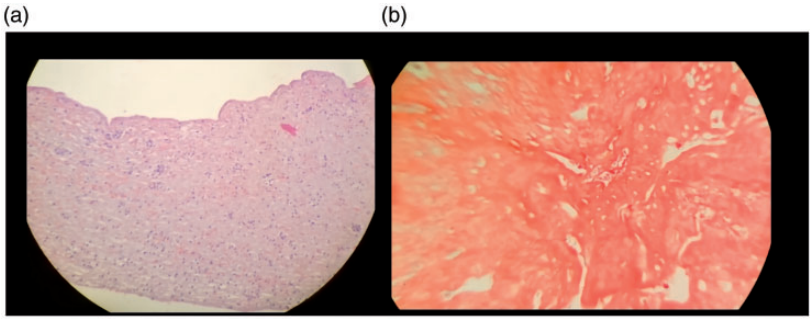


Figure 3. (a) A microscopic image of the resected cyst showing the cystic wall infiltrated by neutrophils. (b) A microscopic image of the wall after Gram-staining showing Gram-positive cocci.



pathological examination an obligatory option to make a definite diagnosis.

Regarding the pathogens involved in the infection, microbiological investigations by Youngson et al., who reported the only case we found on infection of a preexisting mediastinal thymic cyst, revealed that haemophilus influenzaea was involved; unlike our findings.[11]

In conclusion, thymic cysts are – very rarely – prone to infection which may complicate the diagnostic process. The diagnosis of thymic cyst should be considered when confronting anterior mediastinal cystic mass with or without respiratory or constitutional symptoms. Surgical excision and pathological examination are necessary to rule out malignancy and to make a definite diagnosis.

Conclusion

Thymic cyst is a rare benign clinical condition, that typically remains asymptomatic. In very rare occasions, they might be complicated with infection. Since our patient had mediastinal thymic cyst infection without a predisposing condition, the diagnosis was challenging; computed tomography scan, surgery and pathological examination were necessary to reach a final diagnosis.

Finally, we recommend keeping this diagnosis in mind when dealing with an anterior mediastinal cystic mass.

Declarations

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Contributorship: Conception or design of the work: A Alzahran, BS, MZK, MA; Data collection: MZK, BS, SD, A Alhasan, MA; Drafting the article: A Alzahran, SD, JS, JK; Critical revision of the article: BS, MZK, A Alhasan, MA; Final approval of the version to be published: A Alzahran, BS, SD, JS, JK, MZK, A Alhasan, MA.

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