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Mediastinal Cyst with Teratoma in a 19-Year-Old Female: A Case Report

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Abstract

Mediastinal teratoma cysts (cystae mediastinale) are rare incidental findings occurring in approximately 3 to 12 % of all mediastinal cysts (1) Symptoms arise depending on the cyst's specific location (2). This case report describes a 19-year-old female who presented with a mediastinal cyst containing a teratoma. This rare and complex entity was diagnosed through imaging techniques and successfully treated via video-assisted thoracoscopic surgery (VATS). The diagnosis was confirmed by histopathological examination following surgical resection, and the patient's postoperative course was uneventful, with a favourable outcome.

Introduction

Mediastinal cysts are often discovered incidentally during imaging studies performed for other reasons. These cysts are typically considered congenital anomalies which are usually asymptomatic but can become symptomatic depending on their size and location, potentially causing compression of adjacent cardiac structures ((3). Teratomas are a rare subset of tumors that originate from pluripotent stemcells and can contain elements from all three germ layers (4) teratomas are more commonly found in the gonads (2), their occurrence in the mediastinum, pericardium or myocardium is exceedingly rare ((1) (5). This case report sheds light on the clinical presentation, diagnostic challenges, and successful surgical management of a mediastinal cyst containing a teratoma in a young female patient.

Case Presentation

A 19-year-old female, with no significant past medical history, presented with a history of intermittent thoracic pain, described as a locking sensation on the right side of the chest, occurring every two weeks over a seven-month period. The pain episodes were accompanied by mild dyspnoea and lasted for approximately 24 hours, during which she managed the discomfort with over-the-counter analgesics such as paracetamol and ibuprofen. Following each painful episode, she experienced a febrile period lasting about one day, after which her symptoms would completely resolve, only to recur 14 days later.

On initial physical examination, the patient exhibited tenderness localized to the right side of the chest but showed no signs of acute respiratory or cardiovascular distress. Vital signs were stable, and no hemodynamic or respiratory compromise was evident. Her clinical presentation prompted further investigation.

Diagnostic Workup

Laboratory Tests: Initial biochemical analyses, including inflammatory markers such as C-reactive protein (CRP) and leukocyte count, were within normal limits, with no evidence of infection or systemic inflammation. However, during

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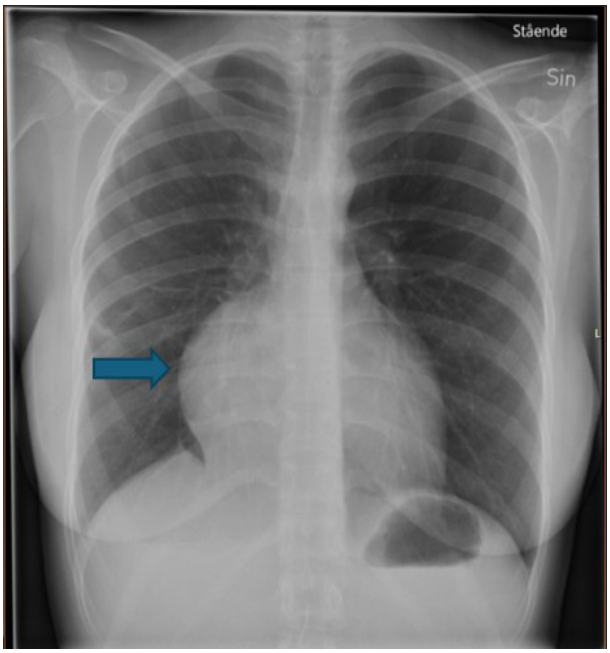

Figure 1: *Chest X-ray showing a protrusion on the right side of the heart corresponding to the mediastinal cyst.*

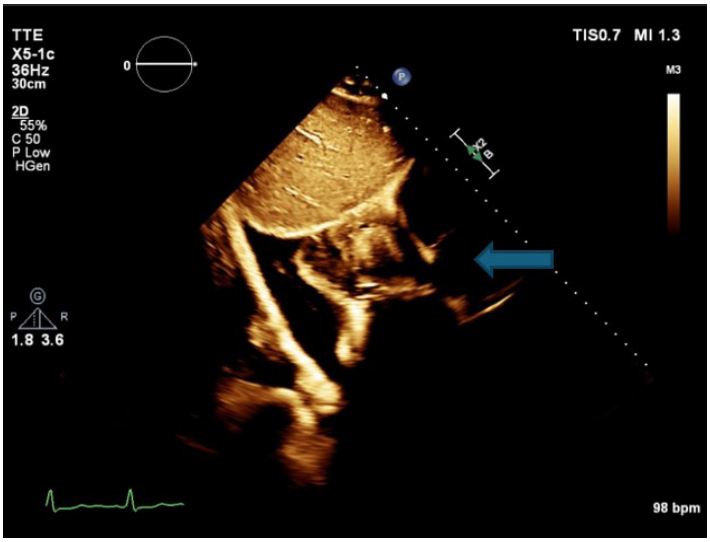

Figure 2: *Transthoracic Echocardiogram showing the heart and a well-defined extracardiac cystic mass compressing the right atrium. Doppler flow signals were detected within the cyst, raising suspicion of a congenital heart defect. Arrow pointing at the tumor.*

a subsequent episode, CRP was elevated to 120 mg/L, indicating an inflammatory response.

Imaging

• **Chest X-Ray (Radiographia Thoracis):** An initial chest X-ray performed revealed a tent-shaped enlargement of the heart shadow, raising suspicion of a pericardial effusion. There was no evidence of pleural effusion nor pulmonary masses.

• **Transthoracic Echocardiogram (TTE):** An echocardiogram identified an extracardiac structure with Doppler flow compressing the right atrium, with otherwise normal cardiac function and anatomy.

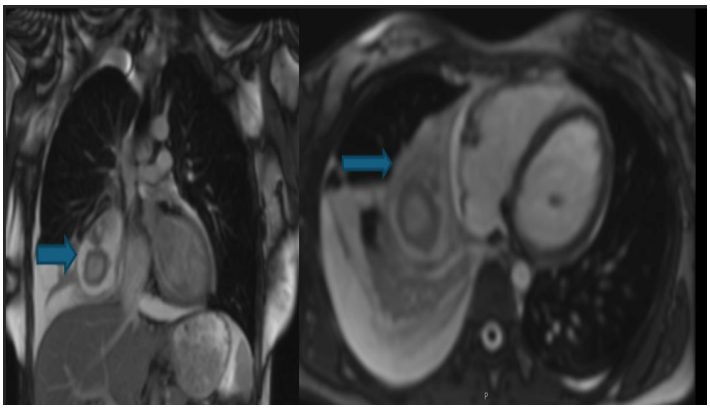

Figure 3: *Cardiac MRI (anterior-posterior and axial views) demonstrating a large mediastinal tumor located near the heart and compressing adjacent structures.*

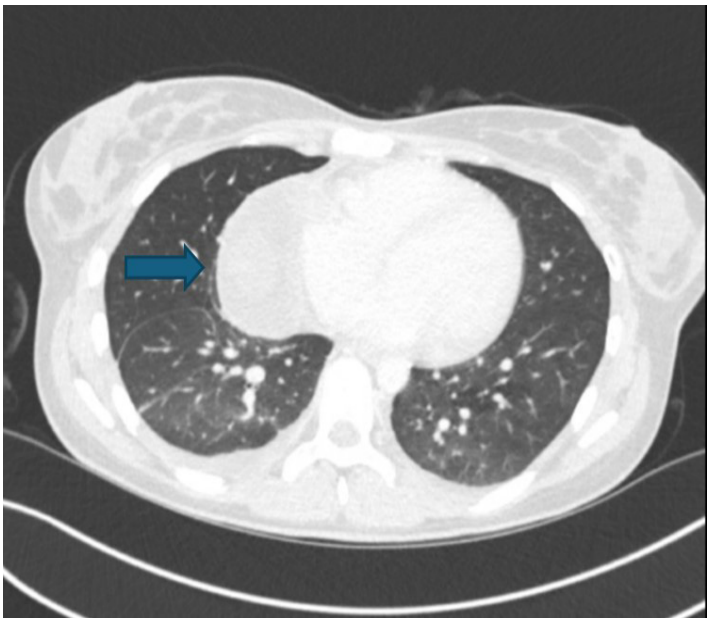

Figure 4: *Cross-sectional CT scan of the thorax demonstrating the large mediastinal cyst closely associated with the heart.*

• **Cardiac MRI (Magnetic Resonance Imaging):** A cardiac MRI was chosen as the first imaging modality due to an initial suspicion of congenital heart disease. MRI was preferred over CT because of its superior ability to evaluate complex cardiac anatomy without exposing the patient to radiation, particularly since CT carries a higher risk of radiation exposure. Additionally, flow was detected in the extracardiac structure on Doppler, further raising the suspicion of a congenital heart defect. The patient's history of being born 10 weeks prematurely made this suspicion even more relevant. The cardiac MRI showed normal cardiac anatomy but identified a tumor-like process in the right lung, along with pleural effusion on the right side. The tumor appeared to exert pressure on adjacent cardiac structures.

• **CT scan (Tomographia Computatensis):** A follow-up CT scan of the thorax and abdomen confirmed the presence of a large cystic mass on the right side of the heart, which

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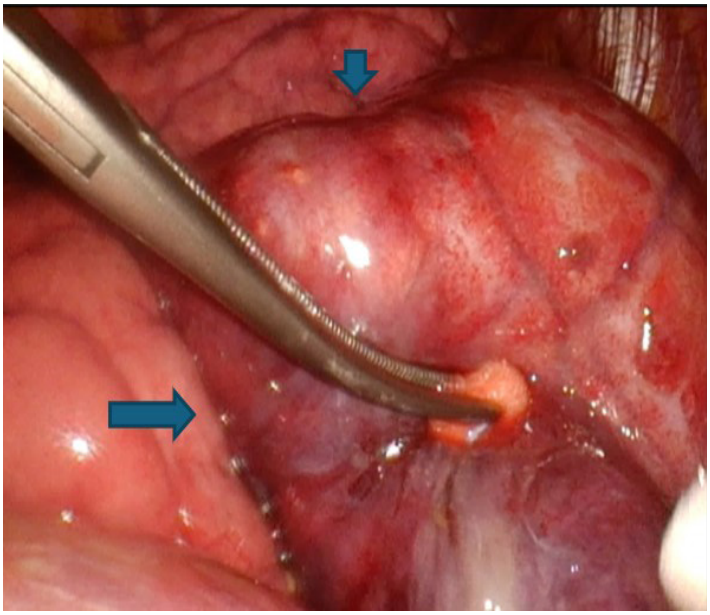

Figure 5: *Photograph of the surgically removed mediastinal cyst, measuring 12 x 9 x 7 cm. The arrows pointing at the mediastinal tumor.*

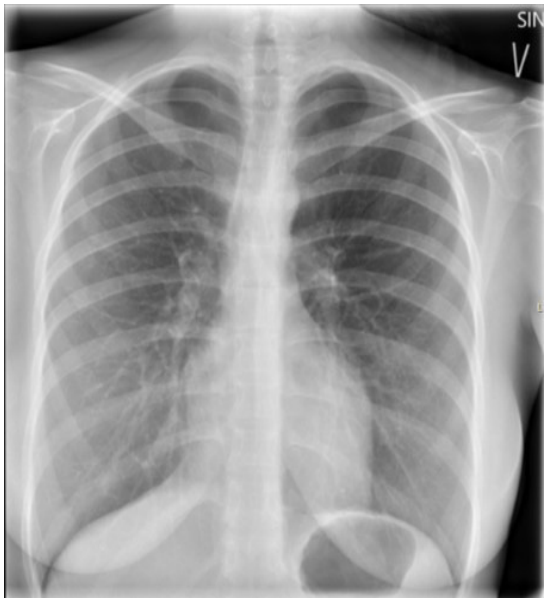

Figure 6: *Chest X-ray post-surgical resection of the cyst, now displaying a normal heart silhouette.*

appeared inseparable from the pericardium. The mass contained both fluid and solid components with calcification.

• **PET-CT scan**: Demonstrated mild pathological activity in the solid components of the solid/cystic lesion on the right side of the thorax, located in close proximity to the pericardium but without signs of invasion. The predominantly cystic component showed no metabolic activity. Mild right-sided pleural effusion was observed. No other pathological findings were identified. There was no sign of metastatic disease.

• **Multidisciplinary Team (MDT) Conference:** The case was reviewed in a multidisciplinary thoracic surgery conference, where a teratoma was suspected based on the imaging findings. It was decided to proceed with a VATS for tumor resection.

Diagnosis

The working diagnosis of a mediastinal cyst containing a teratoma was established based on imaging findings and clinical presentation. The thoracic surgery department opted for a surgical resection via VATS, histopathological analysis confirmed the presence of a benign teratoma. The cyst was measured at 12 x 9 x 7 cm. Inside, it contained yellowish-serous fluid and large amounts of yellow sebum. Additionally, there were two circular, polypoid growths within the cyst, one of which measured approximately 30 x 25 mm. These growths were covered with white sebum and hair. The inner lining of the cyst was described as smooth and shiny, resembling mucosa, and the growths had a pink, gelatinous appearance on the cut surface.

Treatment and Prognosis

The patient underwent VATS where the teratoma cyst was successfully excised without complications. A standardized 3-port VATS procedure was chosen allowing for precise removal of the mass while reducing postoperative discomfort and facilitating a faster recovery (6). The patient's postoperative course was smooth, and she was discharged after two days of admission without any signs of recurrence or complications. A follow-up chest X-ray three weeks after surgery confirmed complete removal of the cyst, and the patient remained asymptomatic.

Discussion

Mediastinal cysts, although rare, can present a significant diagnostic and therapeutic challenge when they become symptomatic or are associated with other complex abnormalities such as teratomas. The presence of a teratoma within a mediastinal cyst is an extremely rare occurrence and necessitates a careful and thorough diagnostic approach. Imaging studies, particularly CT, are important in characterizing the abnormality and planning surgical intervention. VATS has emerged as a highly effective and less invasive method for excising such masses, offering a favourable outcome with minimal risk of postoperative complications.

This case highlights the importance of considering rare and complex differential diagnoses in young patients presenting with recurrent thoracic symptoms. The successful management of this case demonstrates the value of a multidisciplinary approach, combining advanced imaging techniques with minimally invasive surgery to achieve optimal patient outcomes.

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Conclusion

This case report emphasizes the critical role of comprehensive diagnostic evaluation and timely surgical intervention in managing rare thoracic conditions including mediastinal cysts with teratomas. The use of VATS for resection not only ensures complete removal of the cyst but also minimizes the risk of complications and promotes rapid recovery. Early diagnosis and appropriate management are key to achieving a favourable prognosis and improving the patient's quality of life.

Declarations

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