

## Imaging Characteristics of a Mature Posterior-mediastinal Teratoma

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Although mature teratomas are a common cause of anterior mediastinal tumors, they rarely arise in other mediastinal compartments. We describe a 16-year-old boy with a 20×10 cm mature cystic teratoma in the posterior mediastinum. This case emphasizes the importance of correct diagnosis if a mediastinal mass with the typical features of a mature teratoma-such as fat, cystic compartments, calcification or teeth-is found in the unusual location of the posterior mediastinum.

Key words: chest radiography, computed tomography, mature teratoma, posterior mediastinum

### INTRODUCTION

The majority of benign teratomas are found in the anterior mediastinum at or near the thymus but rarely in the posterior mediastinum<sup>1,2</sup>. Teratomas in the posterior mediastinum are clinically distinctive and frequently involve surrounding structures requiring thorough preoperative assessment<sup>3,4</sup>. We describe the case of a mature cystic teratoma in this unusual location.

### CASE REPORT

A 16-year-old boy was admitted to our hospital for investigation of a mediastinal tumor discovered during a routine medical examination. For one month, he had the symptoms of cough, intermittent dyspnea, and left-chest pain upon deep inspiration. Clinical examination was unremarkable except for dullness to percussion and reduced breath sounds in the left lower chest. Biochemical and hematological analyses were negative. Chest radiographs showed a large lobulated mediastinal mass projecting towards the left side with radiolucent areas surrounded by curvilinear calcifications (Fig. 1). Computed tomography (CT) of the chest showed a well-defined heterogeneous mass, measuring 20.3×10.5×11.3 cm and contain-

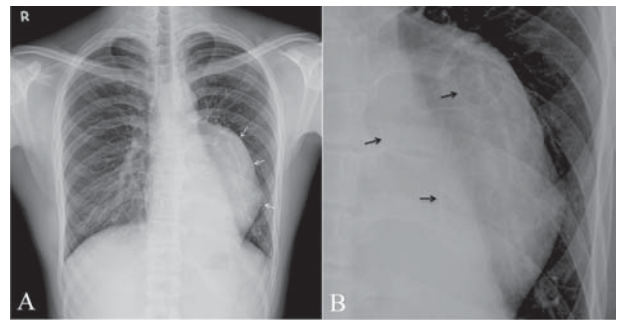


Fig. 1 A posteroanterior chest radiograph depicted a lobulated mediastinal mass (arrows in 1A) with several radiolucent areas surrounded by curvilinear calcifications (arrows in 1B, closed-up view)

ing multiple areas of fat density with calcified rims and circumscribed cystic components (Fig. 2). The adjacent lung parenchyma and vasculature were not invaded by the mass. Testicular and abdominal sonograms were normal. The  $\alpha$ -fetoprotein,  $\beta$ -human chorionic gonadotropin and lactic dehydrogenase levels were within normal limits.

Because of the large size of the tumor, a left-antrolateral thoracotomy was performed, showing a well-encapsulated mass containing sebaceous oily material, hair, and bony and cystic components. Histopathology confirmed the diagnosis of a mature cystic teratoma (Fig. 3). The postoperative course was uneventful, and the patient was discharged five days after admission. At the 6-month follow-up visit, the patient's recovery was good, and chest radiographs showed no evidence of recurrence.

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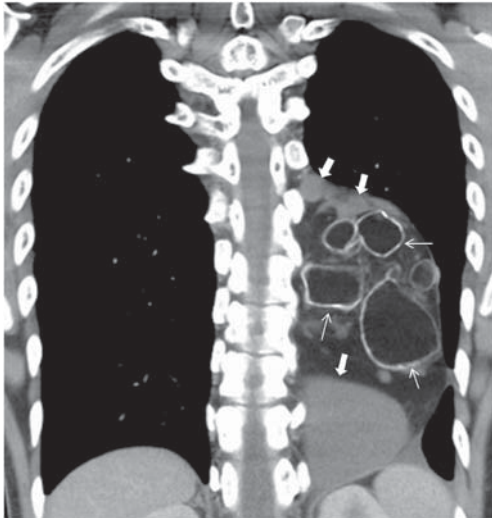


Fig. 2 On axial and coronal chest CT, the mass showed multiple fatty components with calcified rims (arrows) and several cysts (thick arrows) with variable sizes.

## DISCUSSION

Teratomas are germ-cell neoplasms that contain one or more well-differentiated tissues derived from all germinal layers<sup>1,2</sup>. These tumors are almost always benign, but carcinoma may develop occasionally within one of the germinal layers<sup>5</sup>. They occur at all ages but more commonly in adolescents and young adults, with a slight predominance in females. Only 3% of germ cell tumors are mediastinal, with teratomas accounting for 60-75% of cases<sup>1,2,5</sup>. Teratomas usually occur in the anterior mediastinum near the thymus but occasionally occur in the posterior mediastinum<sup>1,2</sup>. Only a few of cases of posterior mediastinal teratoma have been described<sup>3,6,7</sup>. This patient is the only case we have seen in our hospital during the past 20 years.

Mediastinal teratomas are usually discovered as an incidental finding on chest radiographs obtained for unrelated reasons<sup>1,2</sup>. Mature teratomas of the posterior mediastinum usually appear as well-defined, rounded soft tissue masses adjacent to the spine. They may contain fat, discrete or well-formed calcification, or teeth. However, slight calcification and a small amount of fat may not be obvious on the chest radiographs. CT images are variable, depending on the composition of the tumor. CT often shows a combination of several densities, including fat, soft tissue, water, and calcification<sup>1-4,6,7</sup>. The presence of teeth or fat, particularly fat-fluid level, provides a certain

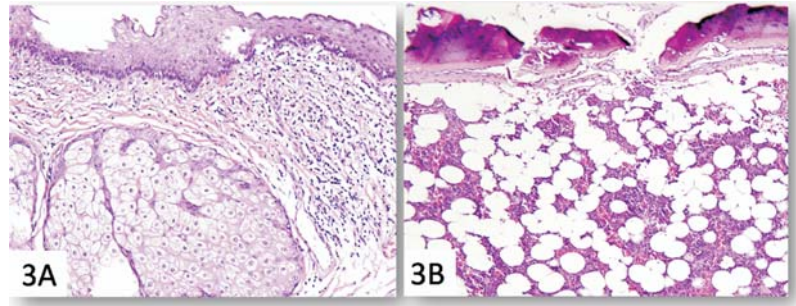


Fig. 3 The sections of the tumor specimen confirmed the diagnosis of mature cystic teratoma with following characteristic features: stratified squamous epithelial lining with focal skin appendage (3A, H&E,  $\times 100$ ) and bony fragments with marrow component (3B, H&E,  $\times 100$ ).

diagnosis<sup>1,2</sup>. Our patient's chest CT was the most valuable imaging modality for our diagnosis. It was also useful in defining the tissue planes between the tumor and the surrounding mediastinal structures for preoperative planning.

True fatty tumors of the mediastinum are relatively uncommon, accounting for less than 1% of a series of 1064 surgically proven cases of mediastinal masses<sup>8</sup>. This rarity is especially true for tumors in the middle- and posterior-mediastinal compartments. Possible diagnoses from the imaging findings in our case included liposarcoma, angiolipoma, lipoblastoma, or complicated lipoma<sup>9</sup>. On CT, virtually every case of liposarcoma consists of fat mixed with large areas of soft tissue components often showing local patterns of extension or infiltration. Lipoblastoma, a benign tumor of childhood, may show a heterogeneous fatty lesion with characteristic intratumoral streaks and whorls due to the tumor's fibrovascular network. Angiolipoma usually appears as a combination of fat and enhancing soft tissues that were not present in our case. The characteristic combination of fat with calcified rims and fluid-filled cysts suggested a mature cystic teratoma as the most appropriate preoperative diagnosis.

This case emphasizes that mature teratomas, with their characteristic images of fat, cysts, and calcifications, may occur in a very unusual location, the posterior mediastinum.

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