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Case Report

A unique case of a giant anterior mediastinal teratoma extending into right hemithorax in an adult male: a case report

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ABSTRACT

Teratomas are unusual, benign germ cell tumours. Teratomas most frequently are located in the anterior mediastinum as extra-gonadal location. Early detection and timely surgical intervention can symptomatically improve the patient. We hereby describe the case of a, male patient aged 21 years who had dyspnoea and a prolonged productive cough for 2 months. A large, well-circumscribed mass in anterior mediastinum associated with calcifications was discovered during imaging studies, which included a chest CT scan with contrast and a chest X-ray of size 22×10×8 cm. The patient underwent right thoracotomy with resection of mediastinal tumour, and the diagnosis was validated by histopathological analysis. The patient recovered without complications and was discharged in a stable state. Because of their varied imaging features and vague symptoms, mediastinal mature cystic teratomas are difficult to diagnose. The best line of management is surgical excision.

Keywords: Anterior mediastinal mass, Germ cell tumours, Mature cystic teratoma, Extra gonadal tumours, Diagnosis, Management

INTRODUCTION

Mediastinal germ cell tumours account for 50-70% of extragonadal tumours.[1-3] They are most prevalent in the anterior mediastinum. Extragonadal germ cell tumours develop from the midline from the cranium (pineal gland) to the presacral area, corresponding to the embryologic urogenital ridge, presumably from aberrantly migrated germ cells. Teratomas contain elements of all three germ layers, i.e., ectoderm, mesoderm and endoderm. The ectodermal component is the most predominant, containing skin, hair, sweat glands, sebaceous glands and teeth. Benign teratomas are the most common germ cell tumour, occurring 70% in children and 60% in adults. They occur at any age, but most commonly arise between 20-40 years. Teratomas are composed of mature elements of the three germ layers and exhibit a benign course. They are solid or cystic in appearance and are usually referred to as dermoid cysts if unilocular. Benign tumours are often asymptomatic; malignant tumours present with chest pain, dyspnoea, cough, fever, or complaints due to compression or invasion of adjacent mediastinal structures. Sonographic patterns may improve the diagnostic accuracy in teratomas.[4] Examination of the testes carefully by ultrasound of testis should be performed. Definitive management of mature mediastinal tumour is complete surgical resection which results in excellent long- term cure.

CASE REPORT

Male patient aged 21 years presented with complaints of persistent productive cough and breathlessness for 2 months. On examination, decreased air entry was noted on the right side infraclavicular, infra mammary and infra-axillary areas. Mediastinal mass and collapse of the right lung was noted in chest X-ray. On PET CT, there was a large well well-defined, heterogenous lesion

measuring 18.2×16.7×20.2 cm, seen in the right hemithorax predominantly in mid and lower zones, showing fat component, soft tissue density and calcification. The lesion was extending into the mediastinum, causing displacement of mediastinal structures to the left. Inferior lesion is indenting on the superior surface of the liver. Adjacent lung parenchyma shows atelectatic changes. Testes appeared to be normal.

The patient was prepared for surgery after taking informed written consent from the patient and his relatives. Right anterolateral thoracotomy was done through 5th ICS. Intra-operatively, a large mass of size 22×10×8 cm was present in the right hemithorax. The mass was meticulously dissected from the surrounding structures without injuring any vital structures, and excised. Intraoperatively, hair and teeth were found inside the lesion.

HPE report showed findings suggestive of Mature cystic teratoma. Sections showed a cystic cavity filled with pultaceous material with few hairs. Microscopically, mature squamous epithelium with hair follicles, sebaceous and seromucinous glands, mature adipose tissue, cartilage and muscle bundles are present. Postoperatively, the patient recovered well, symptomatically improved. Post-operative serial chest X-rays showed good lung expansion.

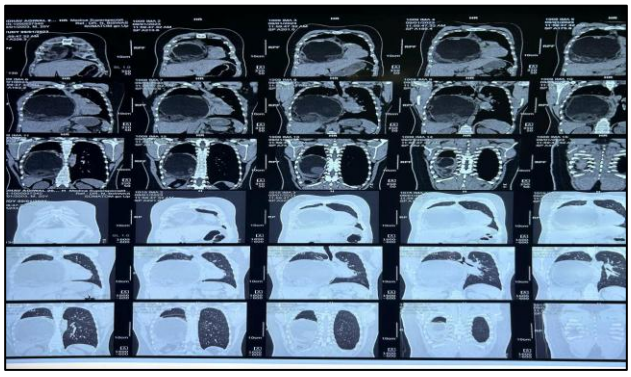

Figure 1: A coronal section chest CT scan showing a huge mature cystic teratoma occupying the right hemithorax.

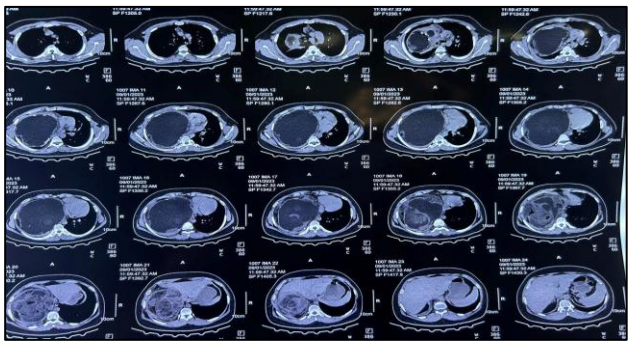

Figure 2: Axial section showing cystic and septations of mature cystic teratoma.

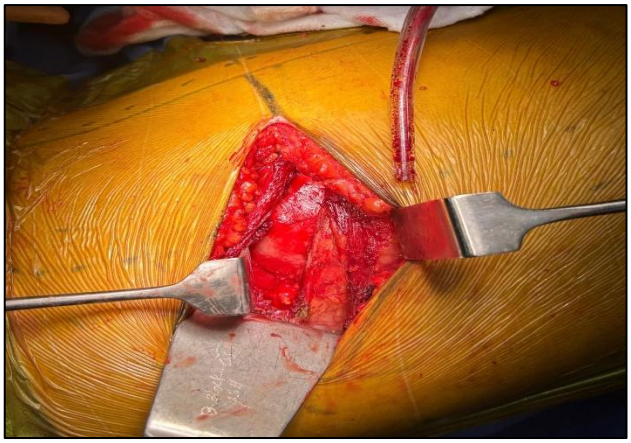

Figure 3: Right thoracotomy approach was done.

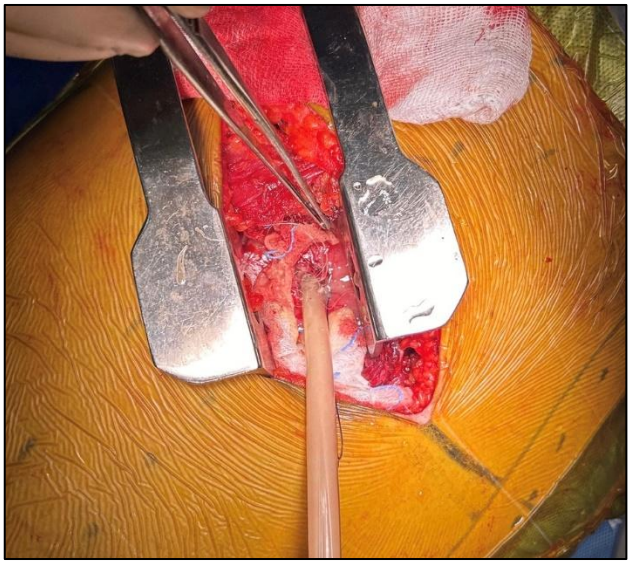

Figure 4: Contents of cyst showing hair, sebaceous material indicating mature teratoma.

Figure 5: Complete resection of giant mature cystic tertoma from right hemithorax.

DISCUSSION

Germ cell tumours of the mediastinum are heterogeneous tumours with different histologies and clinical courses. Teratomas are divided into mature, immature and teratoma with malignant component. Benign teratomas are called dermoid as they contain tissues derived from the ectoderm, 70 percent of teratomas are mature as they contain exclusively mature, adult-type tissues.[5] These tumours typically develop in the sacrococcygeal region, ovaries, testes, brain, neck, and mediastinum, and they affect both sexes equally. Given that germ cell tumour-associated somatic malignancies (GCTSM) in the mediastinum are uncommon and usually manifest as secondary problems after chemotherapy and/or radiotherapy in patients who were first diagnosed with a malignant tumour.[6]

Presence of anterior homogeneous or heterogeneous mediastinal mass, which may be frequently quite large. The differential diagnosis includes other anterior mediastinal masses such as thymoma, lymphoma, thymic carcinoid, intrathoracic thyroid, lipoma, lymphangioma, and GCT. A mixture of tissues from the primitive germ cell layers produces the distinct appearance of teratomas. They appear as round, lobulated, sharply marginated by a smooth capsule, ranging from a few centimeters to huge masses.

Simple and contrast CT shows enhanced capsule and septa with varying densities because of presence of bone, soft tissue, fluid, fat, and teeth, 80 percent shows different types and calcifications, and 90 per cent contain fat. This pleomorphic appearance and the presence of spontaneous air fluid levels are important clues for diagnosis on the basis of CT. The preparation of the surgical program greatly benefits from enhanced CT examination, which is typically advised and an MRI if needed. Benign mediastinal teratomas can be effectively treated with total surgical excision.

Resection is carried out by partial or complete sternotomy, total clamshell incision (bilateral anterior thoracotomies plus transverse sternotomy) or classical lateral or posterolateral thoracotomies. In all cases, the surgeon should make every effort to resect the tumour, unless it becomes adherent to vital structures.[7] When the tumour is closely adherent to the mediastinal surface, care should be taken to protect the brachial plexus nerves, vagus nerve, recurrent laryngeal nerve, and phrenic nerve in order to prevent major consequences.

The prognosis for complete excision of benign teratomas is excellent, with normal life expectancy, even if adherent benign tissue was left behind.[8-10] Yasa et al, documented difficulties associated with total surgical excision, which, although effective, raised the risk of death, sepsis, empyema, and surgical site infection due to the tumor's size and adherence to adjacent organs. Persistent atelectasis and rupture of a portion of the cystic mass during challenging dissection with damaged tumour contents material in the operation field were additional problems.[11]

Although complete surgical excision is usually curative, additional therapies like chemotherapy or radiation therapy may be required if the teratoma shows complex interspersing among surrounding structures or malignant potential. Monitoring for postoperative complications and evaluating any recurring or persistent disease requires follow-up imaging.

CONCLUSION

A small proportion of all mediastinal tumours are mediastinal teratomas, which are uncommon tumours. These tumours can cause symptoms by applying pressure to nearby structures, even though they are frequently asymptomatic. Imaging methods like as CT scans and chest X-rays are essential for identifying and describing mediastinal teratomas. For mature teratomas, surgical excision is the definitive therapeutic strategy, and complete resection usually results in a cure. Following surgical resection, patients with benign mediastinal teratomas have a favourable prognosis; nevertheless, normal tissues and functions should be preserved.

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