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MEDIASTINAL MASS EXCISION-BENIGN MATURE TERATOMA

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ABSTRACT

A 22-year old man asymptomatic presented to our hospital with obliteration of the right cardiophrenic sinus by a mass. A non-invasive investigation demonstrated a tumoral mass which was continuous to the pericardium and caused extrinsic compression to the SVC and right atrium. Suspicion was a thymoma but surgical and anatomopathologic findings led to the diagnosis of a mature cystic teratoma. The diagnosis of this tumor is very difficult through non-invasive investigation. The patient underwent surgical resection via midline sternotomy.

Keywords: *Meditational Mass, Teratoma*

INTRODUCTION

Germ cell tumors occur most frequently in the gonad but can rarely occur in extragonadal locations, usually in or near the midline. Five percent of germ cell tumors are extragonadally located, and men are affected more than women (Nichols, 1992). Most mediastinal teratomas produce no symptoms, and they are more commonly associated with compression of adjacent structures, predominantly those of the respiratory system. Another signal is bleeding or rupture of the tumor into the bronchial tree, pleura, or pericardium. A rare finding associated with rupture is hair or sebaceous material expectoration.

CASES

A 22-year-old young and healthy asymptomatic man presented to our hospital after an abnormal medical check-up before being hired for a police job. A chest X-ray revealed an obliteration of the right cardiophrenic sinus by a mass widening the cardiac shadow. He has no history of fever, weight loss, previous disease, or any neoplasm in his family.

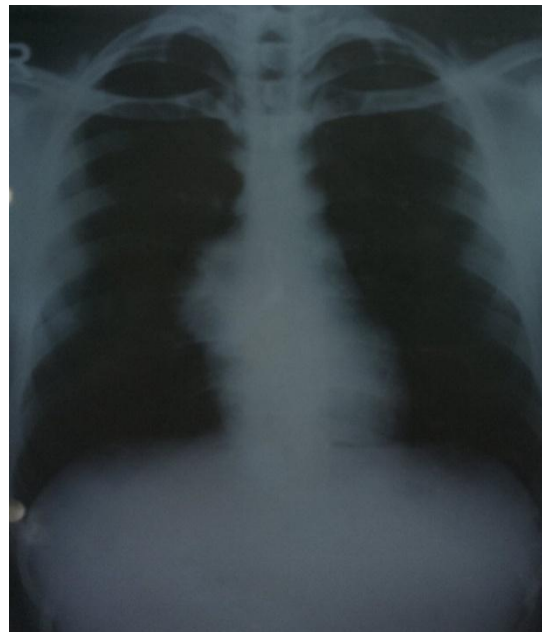


Figure 1- Chest x ray PA view showing a mass in the right cardiophrenic sinus with margin continuous to cardiac shadow

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A 12-lead electrocardiogram was normal. His chest X-ray [figure 1] showed a mass in the right cardiophrenic sinus with homogeneous, hazy density and a partially well-delineated margin continuous to cardiac shadow. A computed tomographic scan [figure 2] showed a septate cystic mass containing septal calcification measuring 5.1cm×5.4cm, which was continuous to the pericardium and caused extrinsic compression of the SVC and right atrium. The mediastinal structures did not show any abnormal lymph nodes or features of compression or infiltration. The mass also shows focal loss of plane with superior vena cava although no definite evidence of invasion was noted. Tran thoracic two-dimensional and real-time, live three-dimensional echocardiography revealed a normal-sized heart with normal function and blood flow velocities. A rounded extra cardiac mass projecting to the right atrium was detected in the parasternal transverse view and apical four-chamber view. The provisional diagnosis of mature teratoma was offered with alternative diagnosis of thymoma.

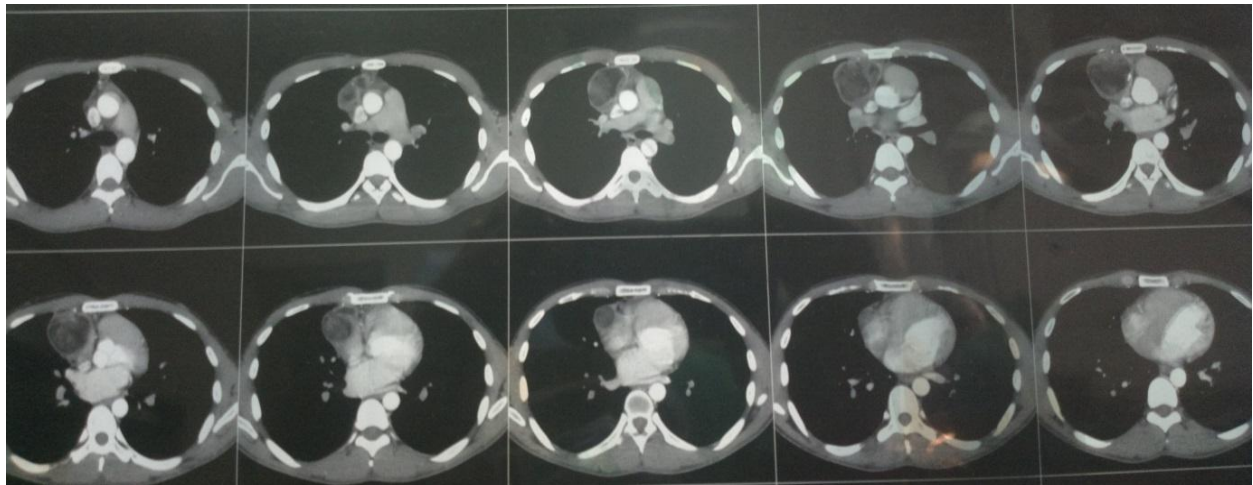


Figure 2: CT SCAN showing a septate cystic mass measuring 5.1cm×5.4cm containing septal calcification

Surgical excision was done through midline sternotomy. This surgical access was chosen because of clinical suspicion that superior vena cava invasion would necessitate cardiopulmonary bypass. As the tumor mass was continuous with the right parietal pleura and pericardium, right pleura opened [figure 3]. There was no cardiac, pulmonary, or vascular invasion. Slow dissection and separation of mass done with finger and scissor protecting surrounding vital structures [figure 4]. The surgical approach was successful. Gross examination showed a rounded tumor measuring 6.0cm × 5.0cm × 4.0cm and weighing 34g [figure 5].

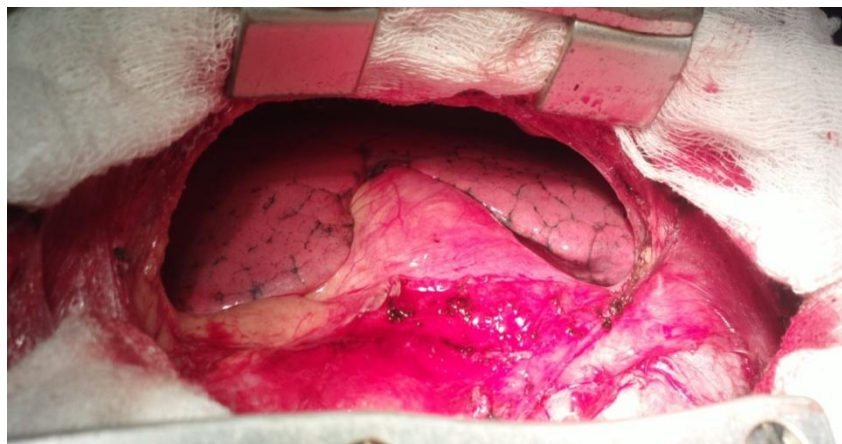


Figure 3: Mass seen in mediastinum through opened right pleura via midline sternotomy

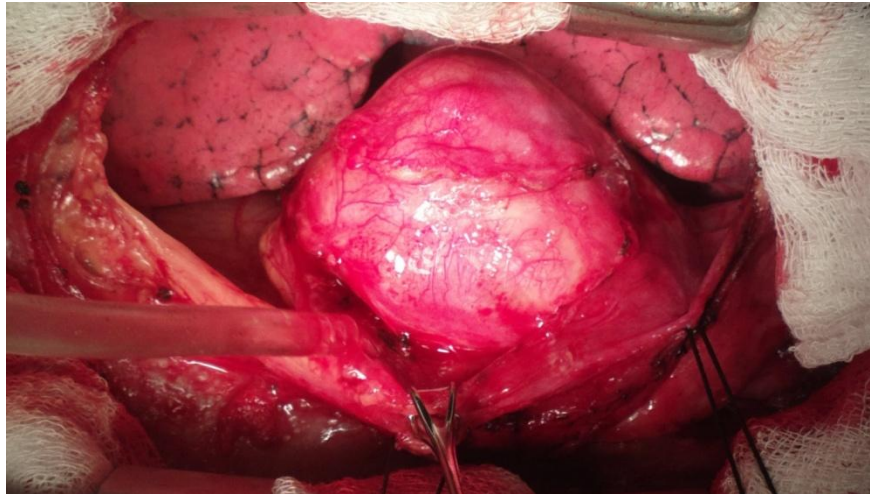


Figure 4: Slow dissection and separation of mass with finger and scissor protecting surrounding vital structures.

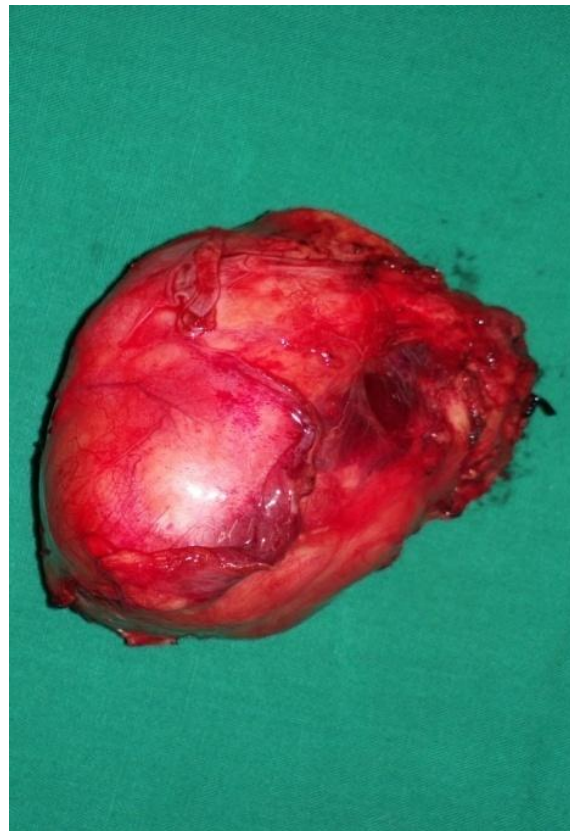


Figure 5: Excised Benign Mature Teratoma

The tumor was predominantly cystic, with a thin, sharply delineated wall filled with sebaceous material and hair [figure 6]. Microscopically, the cyst wall was lined by stratified squamous epithelium with underlying sebaceous glands and hair follicles or by simple ciliated columnar epithelium. Cartilage, adipose tissue, and smooth muscle were also seen in the cyst wall. A histological diagnosis of a mature cystic teratoma was made once immature epithelial, mesenchymal, or neural elements were not found and there was no morphological evidence of malignancy in the tumor. The patient had a good post-operative recovery and was discharged to home on the seventh post-operative day.

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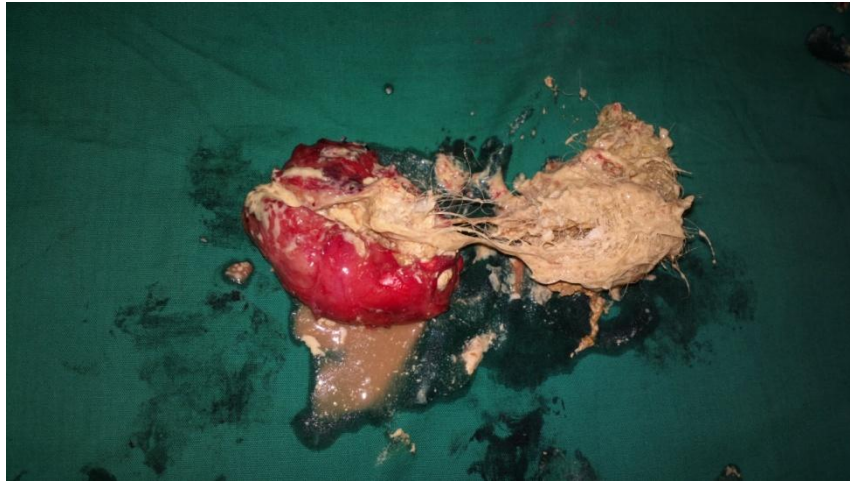


Figure 6: Cut Section of Excised Benign Mature Teratoma

RESULTS AND DISCUSSION

The anterior mediastinum is the most common location of extragonadal germ cell tumors (Duwe *et al.*, 2005; Hueb *et al.*, 1983). Mediastinal germ cell tumors represent approximately 16% of antenormediastinal tumors in adults. The most common histologic type of mediastinal germ cell tumor is mature teratoma followed by seminoma (Nichols, 1992).

Mature teratomas are slow-growing, benign neoplasms of the anterior superior mediastinum that usually arise near the thymus (Hueb *et al.*, 1983). Patients with mature teratoma are usually young adults. Male and female patients are affected equally (Hueb *et al.*, 1983). They are composed of well-differentiated tissues derived from more than one of the three embryonic germ cell layers. Sometimes it is hard to diagnose a teratoma on the basis of imaging examinations. To make the diagnosis of teratoma, it is mandatory to find at least two of three germ layers (Nichols, 1992; Duwe *et al.*, 2005).

The patients are often asymptomatic (up to 53% of cases), and the tumor is discovered incidentally on chest radiographs obtained for other reasons (Michel and Bensadoun, 2005). Large tumors may produce symptoms due to compression of mediastinal structures. Patients may present with cough, dyspnea, chest pain, or pulmonary infection.

Rarely, these tumors may rupture or erode into adjacent structures, such as the pleural space, the pericardium, the lung, or the tracheobronchial tree. In these instances, pleural effusions, pericardial effusions, lipoid pneumonia, or expectoration of oily substances or hair (trichoptysis) may occur (Hueb *et al.*, 1983; Gonzalez, 1982; Nichols, 1991).

The typical radiographic appearance of mature teratoma is that of a rounded, sometimes lobulated anterior mediastinal mass with the borders of the mass sharply marginated against the adjacent lung. Calcification has been reported in approximately 20–43% of cases and may be central, curvilinear, or peripheral (Michel and Bensadoun, 2005; Nichols, 1991). The radiographic visualization of teeth is pathognomonic of teratoma (Rosai and Levine, 1976). Computed tomography (CT) is the modality of choice for the diagnostic evaluation of these tumors. Mediastinal mature teratomas typically manifest on CT as heterogeneous sharply marginated, spherical or lobulated anterior mediastinal masses containing soft tissue, fluid, fat, or calcium attenuation, or any combination of the four. Malignant transformation must be ruled out if contrast enhanced CT scanning reveals a non-homogeneous cystic mass with a fat or oil component and a thick wall with calcification with invasion of the pericardium and great vessels (Dobranowski *et al.*, 1987).

The patient underwent surgical excision. The treatment of mature teratoma consists of complete surgical excision of the mass. The prognosis is very good and 5-year survival rates approach 100%, in contrast to the prognosis of immature teratomas, which may exhibit an aggressive behaviour in adults and may have a poor prognosis (Hueb *et al.*, 1983).

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Conclusion

Benign mature teratoma obliterating the right cardiophrenic sinus can cause SVC and extrinsic heart compression (Rosai and Levine, 1976). Computed tomography (CT) is the modality of choice for the diagnostic evaluation. The correct diagnosis was made by using a surgical approach and histopathology. Midline sternotomy was best approach for exposure and excision. Cardiopulmonary bypass standby is must when there is suspicion of SVC invasion. Complete surgical excision is the only treatment for benign mature teratoma. By proper understanding of anatomy, excision of mediastinal mass seems to be simple and safe.

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