ABSTRACT: Thymolipoma, an anterior mediastinal tumor that is benign in origin, is often asymptomatic, but can enlarge significantly prior to diagnosis. It consists of thymic and fatty tissue and is surrounded by a capsule. Less than a hundred cases have been reported worldwide. Although rare, it should be considered in the differential diagnosis of mediastinal tumors.

In this paper, we report the case of a 44-year-old woman presenting with a giant thymolipoma causing symptoms of severe respiratory distress. The patient underwent surgical resection, which is the main treatment, and remains free of disease.

INTRODUCTION

Thymolipoma is a slow growing mediastinal tumor of thymic origin that is benign. It occurs between 2 and 9% of all thymic neoplasms. It accounts for 1.1% of all solid mediastinal tumors [1].

Patients with thymolipoma, usually remain asymptomatic until the tumor achieves enormous proportions, causing airway and parenchymal compression [2]. That’s why most thymolipomas are diagnosed incidentally after routine radiographic imaging [3].

Thymolipoma may be rarely associated with myasthenia gravis, as well as with aplastic anemia and Grave’s disease [4].

Our patient had severe shortness of breath, occurring at rest, due to the enormous size of her thymolipoma. This incapacitating dyspnea pushed her to seek medical care.

An urgent and successful surgery was sufficient to relieve all her symptoms.

CASE DESCRIPTION

This is a 44-year-old woman complaining of shortness of breath, nasal congestion and sneezing for five months. She was treated with bronchodilators initially. Later she developed a productive cough and early weakness. Her dyspnea was incapacitating at rest and she also had tachypnea and palpitation. Her physical examination revealed decrease breath sounds on the right side.

These symptoms worsened over the last two weeks prior to admission. Her pulmonary function tests showed severe obstruction with a forced vital capacity (FVC) of 1.72 L and a forced expiratory volume (FEV1) of 50%. Her arterial blood gas (ABG’s) was: pH: 7.41; pCO2: 42 mmHg; pO2: 65 mmHg; HCO3: 22 mEq/L. She had a normal echocardiogram.

Her chest X-ray (Fig. 1) showed a large mass in the anterior mediastinum, extending to the right hemithorax with collapse of the right inferior and middle lobes. Computer tomography scan (Fig. 1) demonstrated a large right subpulmonary fat containing lesion, extending to the upper anterior mediastinum, and across the midline, to the left. Its transverse diameter was 23 cm, and its height 17 cm. The mass was suspicious for a fatty tumor. A thoracic biopsy revealed the presence of fatty tissue.

It was decided to proceed with a right thoracotomy to either resect the tumor or to obtain an open biopsy. The surgical procedure was performed under general double lumen endotracheal anesthesia through a right thoracotomy. The mass was occupying the majority of the chest without any local invasion.

The tumor appeared as a solid well circumscribed and encapsulated mass, composed of yellow soft adipose tissue with small randomly scattered solid gray white areas (Fig. 2). The mass was removed in two parts due to its size. A 23.5 x 14.5 x 5 cm mediastinal mass was first excised and sent for frozen section biopsy, followed by the remaining mass measuring 21.5 x 20 x 15 cm. The two masses weighed 520 g and 1610 g respectively, which adds up to a total of 2130 g. Microscopically (Fig. 3), the mass was identified as a thymolipoma.

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Figure 1. Chest X-ray shows a large mass in the anterior mediastinum, extending to the right hemithorax with collapse of the right inferior and middle lobes. CT scan shows a large right subpulmonary fat containing lesion, extending to the upper anterior mediastinum, and across the midline, to the left. Its transverse diameter is 23 cm, and its height 17 cm.

Figure 2. Macroscopic finding: 21.5 x 20 x 15 cm mass of adipose tissue covered by a thin translucent capsule.

Figure 3. Histologic findings: Mature adipose tissue (black filled star) with intimately admixed benign non neoplastic thymic tissue (open star) where we can find several Hassall's corpuscles (arrow).
yellow fatty tissue consisted of mature adipose tissue devoid of atypia. The scattered gray white areas were composed of thymic tissue showing typical cortical and medullary zones with Hassall’s corpuscles. The final diagnosis was a benign thymolipoma without evidence of any malignancy.

Resection of the tumor resulted in immediate improvement in the patient’s pulmonary status. The postoperative course was uneventful and the patient was discharged home in seven days. At one month her pulmonary function tests (PFTs) returned to normal (FVC: 1.98 L and FEV1: 84%) and her oxygenation increased (pO₂: 85 mmHg). Today, after four years of follow-up, the patient is still doing fine without any complaint or any evidence of recurrence on chest X-rays.

**DISCUSSION**

The first case of thymolipoma was described by Lange in 1916, where the tumor was discovered by chance during the autopsy of a patient who died from metastasis of the corpus uteri [5]. Andrus first successfully removed this tumor via a right thoracotomy [6]. Hall in 1948 suggested the term “thymolipoma” for tumors consisting of fat and thymus tissue [7].

Thymolipoma accounts for 2 to 9% of all thymus neoplasms and 1.1% of all solid mediastinal tumors [1]. They are found in children and adults with an average age of 33 years, with no gender predilection [8].

Most reports state that this is an asymptomatic tumor. However, others note that more than 50% of patients present with symptoms, secondary to the local growth and mechanical compression of the neighboring organs [3]. Symptomatic patients mostly have dyspnea, chest pain, upper respiratory infections and chest heaviness. Less frequently patients report easy fatiguability, dysphagia, hemoptysis and weight fluctuation.

Ten percent of these tumors can be associated with myasthenia gravis, aplastic anemia, Grave’s disease, lymphangioma, chronic lymphatic leukemia, Hodgkin’s disease, erythematous systemic lupus, hypogammaglobulinemia, and erythroblastopenia [9].

Thymolipomas are slow growing, non-infiltrating benign tumors. Thus they usually are discovered incidentally at autopsy. They usually do not recur after surgical resection [9].

The differential diagnosis includes: mediastinal cyst, lipoma, mediastinal lipomatosis, thymoma, mature teratoma, malignant neoplasm (liposarcoma, lymphoma, and thymic carcinoma), and aneurysm of the ascending aorta.

Thymolipomas usually attain huge size (68% weighing > 500 g, 23% > 2 kg, and one weighed over 12 kg) [10].

On gross examination they have a flat surface, and are surrounded by a capsule of connective tissue with a light yellowish-white surface. Histologically they consist mostly of mature fatty tissue, and small islands of thymus tissue that can be normal, hyperplastic or showing regressive changes. Also Hassall’s corpuscles and lymphocytes are seen.

The two reports with the biggest number of thymolipoma cases were: “Thymolipoma: Analysis of 27 cases” published in 1994 [11], and “Thymolipoma: Clinicopathologic review of 33 cases” published in 1995 [8].

The first report is a retrospective review of 27 cases collected over 43 years. There were 15 male patients and 12 female patients with age ranging from 2 to 66 years (mean age 26.7 years). Eight patients (30%) were asymptomatic, 15 patients (56%) had symptoms and four patients with unknown clinical history. All tumors were found in the anterior mediastinum. Their sizes ranged from 4 to 36 cm in longest dimension (mean size 18.4 cm). Only one case had large components in both hemithoraces and was resected in two pieces (one 33 cm and the other 17 cm in longest dimension).

The second report described 33 cases of thymolipoma identified from the files of the Department of Pulmonary and Mediastinal Pathology at the Armed Forces Institute of Pathology, Washington, D.C. and the Department of Pathology and Laboratory Medicine, Mount Sinai Medical Center of Greater Miami, Florida. There were 18 male patients and 15 female patients with age ranging from 2 to 64 years (mean age 33 years). Eighteen patients (54.5%) were asymptomatic. All tumors were located in the anterior mediastinum. The tumors varied in size from 4.5 to 36 cm in greatest dimension. No complications were observed in any of those patients after complete surgical resection.

Despite many case reports and large clinicopathologic reviews, the pathogenesis of thymolipoma remains unclear and very controversial [12]. Normally the thymus undergoes regression in late childhood and adulthood where the parenchyma is replaced with fatty tissue. With thymolipoma there is a definite increase in the thymus and fatty tissue. The vast majority of authors believe that thymolipoma is a benign, mixed tumor of mesenchymal-endodermal origin, and that what induces the concomitant proliferation of fatty and thymus tissue is not known.

Based on different histopathological and clinical findings, R. Hudacko et al. discussed three possible theories of thymolipomas pathogenesis [12].

The 1st theory advocates a neoplastic origin from the mesenchymal tissue (lipoma of thymic fat) or a mixed tumor of both endodermal and mesenchymal origins (mixed neoplasm of adipose and thymic tissue).

The 2nd theory advocates a hamartomatous origin from the thymic epithelium and adipose tissue.

The 3rd theory advocates a regression category that includes two theories of thymic involution (involuted thymoma v/s involuted thymic hyperplasia).

The association of thymolipoma with myasthenia gravis and other autoimmune disorders suggests that these tumors are at least related [13]. This is in favor of the theory suggesting that thymolipoma originates from a thymoma, with subsequent involution and replacement with adipose tissue.
On the other hand, Kitano et al. suggest that thymolipoma may be closely related to massive thymic hyperplasia, in which the thymic tissue is gradually replaced by adipose tissue over time. The normalization of lymphocytosis that occurs with resection of both massive thymic hyperplasia and thymolipoma lends some credibility to this theory [14]. Regardless of their origin, thymolipomas are benign tumors.

CONCLUSION

In conclusion, thymolipoma is a rare benign, well encapsulated slowly growing tumor of unknown genesis. Thymolipomas are usually asymptomatic, but can present with respiratory failure. Treatment consists of surgical removal. Long-term prognosis is excellent with no malignant transformation or recurrences reported.

REFERENCES