

## An unusual giant mediastinal teratoma with pulmonary involvement presenting as cough and hemoptysis

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### ABSTRACT

We describe a 22-year-old Chinese woman with a history of cough and hemoptysis due to an unusual giant mediastinal mass with pulmonary involvement. The tumor was successfully resected via a left lateral thoracotomy and a median sternotomy. The histopathological diagnosis was a mature mediastinal teratoma. We describe here the management of this case and wish to emphasise that the surgical resection is feasible in giant mediastinal mature teratoma.

**KEY WORDS:** Mediastinal tumor, Mature teratoma, Computed tomography, Thoracic surgery.

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### INTRODUCTION

Teratomas are the most common mediastinal germ cell tumors. Germ cell tumors make up 10% to 15% of all anterior mediastinal masses in adults.<sup>1</sup> Approximately 33% of patients with intrathoracic teratomas have symptoms. These include fever, cough, hemoptysis, chest pain, weight loss, or superimposed lung abscess.

### CASE REPORT

A 22 -year old Chinese female referred to our insititution with complaints of cough, fever, and

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left chest pain for two months. She visited two community hospitals and received irregular antibiotic treatment, but fever and cough persisted. She was then referred to our institution. She was also complaining of sputum production and hemoptysis for 20 days. At admission, Physical examination revealed an ill-looking with fever (38.4%) and decreased breath sounds in lower zone of left lung. The WBC count was 13,600/mm<sup>3</sup> with 82% polymorphonuclear leukocytes. Chest roentgenogram showed a large mediastinal mass which involved the left upper lobe of lung.

The patient was examined by chest computed tomography (CT), which disclosed a 20cm×12cm×9cm peripherally calcified cystic mass occupying a majority of the anterior mediastinum, highly suggestive of mediastinal mature teratoma. Perforation into the left lung and focal obliteration of adjacent pericardil fat was also demonstrated. The bronchoscopy showed an inflammatory process in the left bronchial system.

The large size, pulmonary involvement, and persistent symptoms caused by this mass represent indications for surgical resection. At operation, a left lateral thoracotomy incision at the fifth intercostal space was undertaken. The large heterogenous mass was severe adherent to the mediastinal pleura and the anterolateral chest wall. The left upper lobe

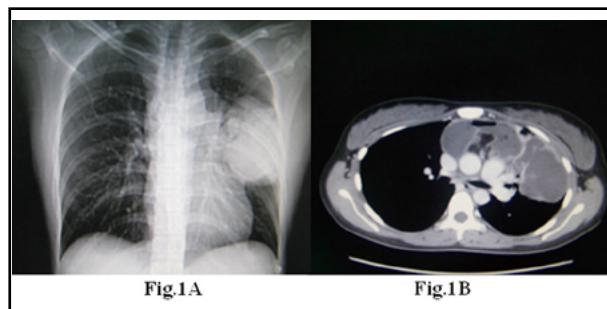


Fig.1A: Posteroanterior chest radiograph showed a large, well-margined mass of the mediastinum extending to the left lung.

Fig.1B: Chest CT showed multiple cystic cavities in the left upper lobe associated with a mass originated in the anterior mediastinum.

was resected. The remaining tumor was difficult to resect and severe adhesions were noted. Thus, a median sternotomy was added to provide adequate exposure for dissection and tumor delivery, with extreme care taken to preserve vital structures such as the aorta, phrenic nerve, recurrent laryngeal nerve, and subclavian vessels. The mass was excised and opened. On the cut section, the mass contained yellowish sebaceous material as well as a quantity of fluid, hair and fat. The whole tumor weighed 3.5kg. Histologic analysis confirmed the diagnosis of a mature teratoma, with abundant fat deposits and different tissues such as cartilage, skin, and hair identified in the cystic wall.

The postoperative course was uneventful, and the patient was discharged in stable condition on 11th post-operative day. She was followed up for three months and remained symptom free.

## DISCUSSION

Teratoma is a germ cell tumor derived from totipotential cells, which comprise several parenchymal cell types originating from three cell layer, and giving rise to different tissues such as skin, muscle, nerve, fat, and tooth structures. Benign teratomas consist of all three layers: ectoderm, mesoderm and endoderm elements based on their histological appearance. About 95% are found in the anterior mediastinum, and mean age at diagnosis is between 20 and 40 years, affecting men and women equally.

Clinical signs of mediastinal mature teratoma depend on the size, location of the tumor and the presence or absence of complications. Untreated benign mediastinal teratomas can cause a variety of complications, such as adjacent tissue compression,

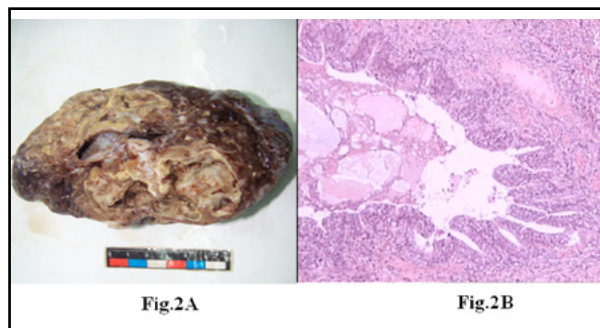


Fig.2A: Photograph showing resected the mass of teratoma via a median sternotomy.

Fig.2B: Pathology revealed a mature teratoma mainly composed of adipose tissue.

infection, atelectasis of the lung, perforation of the hemithorax, and cardiac tamponade due to a pericardial perforation.<sup>2</sup> Most mediastinal teratomas with pulmonary involvement have, for unknown reasons, a predilection for the left upper lobe.<sup>3</sup> So, frequent exacerbation of cough and intermittent episodes of hemoptysis were presented in our patients.

Chest plain radiography is an important diagnostic tool. Calcification and a heterogenous appearance of the mass is highly suggestive of benign teratomas. Chest CT disclosed the structural features and the extent of invasion to the adjacent structures.<sup>4</sup> Whatever its location, shape and size, a mediastinal teratoma warrants chest CT scanning. On chest CT, the combination of soft tissue, calcium, fluid, and fat density in an anterior mediastinal mass is a highly specific finding that allows the prospective diagnosis of mediastinal teratoma. Furthermore, CT can demonstrate the degree of mediastinal invasion and the adhesion to/compression of adjacent structures. Thoracic magnetic resonance imaging is another helpful preoperatively diagnostic method. Thoracic Radiological images are vital to acquire information in the detection and decision making for surgery of mediastinal teratomas. Despite all of the benefits of Chest CT, pathologic evaluation of the tumor must be carried out to establish the final diagnosis, as in our case.

As mediastinal teratoma can involve adjacent tissues and become malignant, surgical resection is the optimal means of diagnosing and treating a mediastinal teratoma. Surgical excision is indicated not only in symptomatic patients but also in those without any clinical manifestation.<sup>5</sup> The results after surgical resection are excellent, and the failure cases were due to delayed surgery.

Surgical resection of mediastinal teratoma can be achieved by median sternotomy or lateral thoracotomy, depending on the size and location of the mass. But many of giant mediastinal teratomas are densely invading compression on vital neighboring intrathoracic structures. When it involves vital adjacent structures, complete removal may not be easy. In these cases, either median sternotomy or lateral thoracotomy only could not provide adequate exposure and delivery for safe dissection of the whole tumor.<sup>6</sup> In our case, median sternotomy, in addition to lateral thoracotomy at the level of the left fifth intercostal space, could provide safeguard for the giant mediastinal mass dissection and delivery.

### CONCLUSION

It is rare for an adult with a giant mediastinal teratoma with pulmonary involvement. The diagnosis has to rely on the radiologic imaging. In cases of giant mediastinal teratoma, surgical removal of the tumor should be done as early as possible. With appropriate plan, total removal of mass is the only curative treatment for giant mediastinal teratomas and the prognosis is good as in our case.

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