

# Giant mediastinal schwannoma located in the lower right side of the chest

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## Abstract

Schwannoma is a type of neurogenic tumor usually found in the posterior mediastinum. Most schwannomas range in size from 2 to 3 cm; some can exceed 10 cm. We herein report a case of a rare, large mediastinal schwannoma whose size is 20 cm × 15 cm × 12 cm, which has rarely reported before. Computed tomography scan showed a huge mass filling the lower right side of the chest and was compressing the right lower lobe of the lung. Subsequently, the tumor was completely resected using a right posterior lateral thoracotomy approach. The patient had an uneventful postoperative course and had done well since discharge from the hospital.

**Key words:** Intraoperative hemostasis, mediastinal tumor, schwannoma

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## Introduction

A schwannoma is a benign intrathoracic neurogenic tumor. The majority of mediastinal schwannomas originate from either the intercostal nerves or paravertebral sympathetic nerve. A differential diagnosis can be achieved through the use of computed tomography (CT) and/or magnetic resonance imaging (MRI). Surgical resection is regarded as the best treatment, as well as the most effective method to obtain tissue and thus obtain a definitive diagnosis. The surgical approach depends on the tumor's characteristics, location, and size. In this article, we report a case of a patient that presented with a large mediastinal schwannoma who subsequently underwent thoracotomy.

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## Case Report

A 45-year-old male with a 4-year history of a choking sensation in chest accompanied by a productive cough was referred to our hospital because of a mediastinal mass which was incidentally discovered on a routine chest radiogram. The CT scan showed a large, round mass with a distinct border, compressing the right lower lobe of the lung, causing atelectasis of the lower right lung. The mass had a nonhomogeneous density and contained calcifications [Figure 1]. The tumor was preliminary diagnosis as a schwannoma, and no matter what it is, it should be resected through a surgery as it has caused some serious symptoms.

On March 24, 2015, we performed an operation through a right posterior lateral thoracotomy. During the surgery, we saw the mass was seriously adherent to the chest wall and pleura and originated from the paravertebral sympathetic nerve. The tumor was coated with a white envelope and filled

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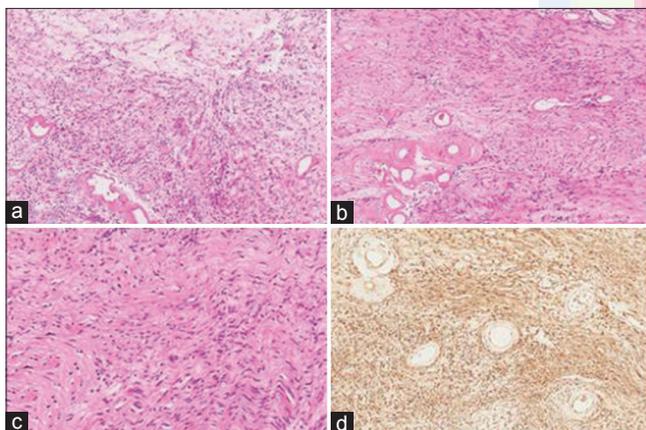
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**Figure 1:** Chest computed tomography scan showed a large, round mass with a distinct border, compressing the right lower lobe of the lung. With a contrast-enhanced computed tomography, the mass had a nonhomogeneous density



**Figure 2:** The tumor was 20 cm × 15 cm × 12 cm and 1750 g in weight. When cut into two pieces, we found yellowish-white or meat-like tissues as well as some cystic tissues, which is filled with cystic fluid



**Figure 3:** The tumor was made up of spindle cells (a-c). The tumors had clear boundary (b and c). In immunohistochemical analyse, it was diffuse positivity for the S-100 antigen (d)

the right upper thorax. The base of the tumor was connected to the posterior chest wall, where several collateral vessels had formed. We carefully separated the adhesions between the tumor and the lower lobe of the right lung, permitting space to resect the basal part of the tumor. The tumor was completely resected. When cut into two pieces, we found the tumor was comprised of yellowish-white or meat-like tissue as well as some cystic tissue and was filled with cystic fluid. The tumor grossly measured 20 cm × 15 cm × 12 cm and weighed 1750 g [Figure2].

Postoperative pathology confirmed the schwannoma, and it is made up of spindle cells. Besides, immunohistochemistry staining was diffuse positivity for S-100, glial fibrillary acidic protein, while epithelial membrane antigen, neurofilament, S-100 protein, Ki-67, CD-34, and smooth muscle actin were all negative [Figure3].

## Discussion

Overall, 12.0–39.0% of all mediastinal tumors are neurogenic tumors, and 95.0% of these neurogenic tumors are schwannomas, which are most likely to occur in the posterior mediastinum. Almost all of the mediastinal schwannomas arise in a paravertebral location from sympathetic trunks or intercostal nerves.<sup>[1,2]</sup> They usually occur in one of two patterns; one is an organized architecture with a cellular palisading pattern of growth (Antoni's Type A) or a loose reticular pattern (Antoni's Type B).<sup>[3]</sup>

Most mediastinal tumors are found incidentally during routine imaging testing. A differential diagnosis of a mediastinal schwannoma can be achieved by use of imaging examination such as CT scans and MRI.<sup>[4,5]</sup> Both provide accurate information regarding the tumor size, localization (including proximity to surrounding structures), and characteristics. With a contrast-enhanced CT, schwannomas usually appear as homogeneous, low-attenuation lesions. Conversely, on noncontrast CT, they appear as a homogeneous enhancement or early central blush. Mediastinal schwannoma usually range in size from 2 to 3 cm; some can exceed 10 cm. Although in some rare instances, such as in the case of our patient, they can also be very large. In an immunohistochemical analysis, schwannoma is often diffusely positive for the S-100 antigen.<sup>[6,7]</sup>

Resection of this giant tumor was challenging due to its large size and seriously adhesion. Thoracoscopy was not feasible given the large size of this mass as it would have limited the visual field of the tumor's base where several collateral vessels had developed as well as the huge tumor can hardly took out of the chest from a small incision. Therefore, we opted to perform an open procedure (thoracotomy), which is evaluated as a more appropriate method when resecting large tumors in the mediastinum. Operating on such a large mediastinal schwannoma requires the surgeon to be highly experienced and skilled. The main challenge is how to control the amount of bleeding when reducing the adhesions, and what's more, it is really hard to stop bleeding when separating the basal part which is hidden behind such a huge mass and is rich in nutrient vessels. In fact, during our surgery, we found the tumor was adherent to the pleura so seriously that it was really hard to expose the basal part of the tumor. We had to separate the adherent carefully first to expose the main nutrient vessel, and then it was clamped

cut and ligated. In the process of separating adhesion, we found some hemorrhage in different sites. However, as the tumor was so big, we could hardly get satisfied surgery field and enough operation space to deal with them. Therefore, we decided to cut off the tumor first and then dealt with the hemorrhage. As a result, the patient inevitably lost some blood. Thanks to our right disposition of the main nutrient vessel before resecting the tumor, the total amount of blood loss was just 500 ml. The patient had no significant postoperative complications and had maintained good health since the surgery.

Generally speaking, mediastinal schwannomas are benign and asymptomatic, so sometimes we did not pay much attention to them when the tumor did not arise related symptoms. However, in our case, the tumor grows bigger and bigger and this large mass finally seriously compressed the right lung, causing the patient to experience a choking sensation accompanied by a productive cough. From our experience, early diagnosis plays a very important role in the treatment, and imaging examination is the best method to make an early diagnosis. Sadly, nowadays medical examination like CT scans is not popular among young people. Therefore, we should emphasize the importance of imaging examination and make it more widely available for people of different age. Besides, we wonder if there are any things we can do to avoid a fierce hemorrhage. For example, we find some vascular interventions such as seldinger technique<sup>[8]</sup> has been used in many tumorectomy to block nutrient vessel before the surgery to reduce the amount of bleeding. Can vascular interventions be used in the resection of huge tumors? Besides, we think a preoperative tumor

angiography can help us to see the location of the important nutrient vessels, which may facilitate the operation and avoid hemorrhage effectively. These ideas have not been tried before, and it is our hope that our ideas may assist future clinicians in their treatment of huge mediastinal schwannoma.

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### Conflicts of interest

There are no conflicts of interest.

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