

Case Report

Resection of a mediastinal schwannoma using video-assisted thoracoscopy*

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ABSTRACT

Schwannomas are tumors that are typically benign. They are derived from Schwann cells (glial cells of the peripheral nervous system that serve to separate and isolate nerve cells from adjacent structures). The most common type of schwannoma is a benign tumor of cranial nerve VIII and is referred to as an acoustic neuroma. When extradural, such tumors usually present as masses that can invade adjacent structures, thereby becoming symptomatic, as in the case of intrathoracic schwannomas (typically found in the posterior mediastinum). Herein, we present a case of a schwannoma treated through video-assisted thoracoscopy, and we review the literature on the subject.

Keywords: Mediastinal neoplasms/surgery; Neurilemmoma; Thoracic surgery, video-assisted; Case reports [publication type]

INTRODUCTION

Schwann cells (cells from which benign tumors called schwannomas, or neurilemmomas, are derived) are specialized cells that are present in the axon. Their function is to produce myelin for the axons. Most schwannomas are cranial nerve VIII tumors (acoustic neuromas). When present in extradural regions (in this case, adjacent to the posterior mediastinum), such tumors present similar characteristics, such as a benign appearance and slow growth. The symptomatology is due to the compression of neighboring structures. The

diagnosis is usually made by chance or pursuant to intrathoracic compressive symptoms, such as pain, cough and dyspnea. The majority of such tumors are sporadic, and virtually all present a mutation in the NF2 tumor suppressor gene. The recommended treatment is resection, video-assisted surgery being a possibility. In the medical literature, there are few reports of cases of mediastinal schwannoma treated exclusively through video-assisted thoracoscopy.

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CASE REPORT

A 32-year-old female patient was referred to the thoracic surgery department due to sharp, intermittent pain in the right flank, mostly in the rib cage. The pain started gradually, radiated to the ipsilateral lumbar region, was accompanied by dyspnea and had been ongoing for two years. The patient reported increased pain upon drawing a deep breath. She also reported that nothing alleviated her pain and that there were no pain-free positions. She reported no weight loss. According to the patient, her symptoms had intensified within the last year, and she sought medical treatment. She had been treated with intravenous analgesics, without further investigation. There had been a progressive worsening of the symptoms, especially in the last three months, with the onset of cough, sputum production, hemoptysis and heartburn. Her medical history revealed no peculiarities, and she described herself as a nonsmoker. The results of the physical examination were normal.

The chest X-ray showed an extensive lesion with well-defined borders in the superior segment of the lower right apical lobe, with the main trachea and bronchi preserved. A computed tomography scan was ordered. The scan revealed an extensive lesion on the right posterior mediastinum with heterogeneous density, measuring approximately 6.6 × 6.4 × 4.9 cm, in continuity with the parietal pleura and thoracic vertebra, without lymph node enlargement or other alterations (Figure 1). After complete staging (laboratory tests, endoscopy of the upper digestive



Figure 1 - Helical computed tomography, in which the lesion is easily identifiable, showing the absence of invasion or infiltration of the adjacent tissues and organs

tract, fiberoptic bronchoscopy and spirometry within the normal range), surgery was recommended.

With the patient lying on her left side, four accesses were created, and the camera was introduced, anteriorly, into the fifth intercostal space, facilitating the viewing of the tumor (Figure 2). After dissection, the mass was completely isolated (it had not invaded the adjacent tissues), without surgical complications. The mass was removed after the enlargement of one of the accesses (Figure 3).

The patient presented favorable postoperative evolution and was discharged with no symptoms two days after the procedure. The anatomopathological examination showed that the lesion, consisting of encapsulated elastic tissue and weighing 70 g, with glossy gray stripes, was a schwannoma.



Figure 2 - Video-assisted thoracoscopy using a 0° objective

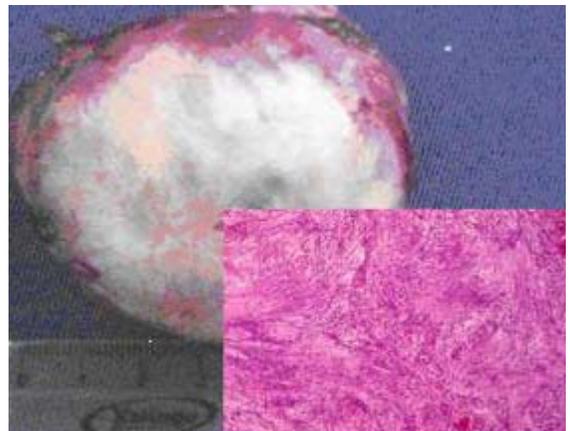


Figure 3 - Tissue sample (of approximately 6.5 cm) immediately after resection, presenting a hardened consistency. In the lower right-hand corner, a strip of the sample presenting aspects characteristic of a schwannoma.

DISCUSSION

Tumors derived from Schwann cells are encapsulated, firm, delineated gray masses, in close proximity to the nerve of origin. Cystic areas are occasionally seen accompanying the tumor. Such tumors present two patterns of growth (Antoni type A and Antoni type B), with various degenerative alterations, such as nuclear pleomorphism, xanthomatous alterations and vascular hyalinization, without prognostic differences. They are rarely cancerous. Local recidivism can occur after incomplete removal of the lesion.

Schwannomas are most commonly associated with the cranial nerve VIII (acoustic neuroma), followed by the cranial nerves V and X.⁽¹⁻¹³⁾ It rarely involves extradural nerves. When this happens, they are usually located in the large nerve trunks. In the thorax, schwannomas are found in the posterior mediastinum (paravertebral posterior ridge) on the brachial plexus, as well as, albeit less frequently, in the intercostal nerves.^(1,14) They are usually singular and are diagnosed by chance in simple chest X-rays.⁽¹⁴⁾ When of larger proportions, they cause compressive symptoms such as pain and paresthesia. Schwannomas are found in patients of various ages, with no gender preference, although they occur more often in individuals over the age of 40.

As mentioned previously schwannomas can be diagnosed by chance, (through simple X-rays taken during physical examinations) or subsequent to the onset of symptoms related to tumor-induced compression, usually after years of tumor development. The initial investigation involves simple chest X-rays, using an oblique incidence of the central foramen of the spinal cord to delineate the lesion. The results of the computed tomography and magnetic resonance imaging, which have diagnostic superiority and better delineate the tumor, eliminate any doubt. In our practice, we rarely use magnetic resonance imaging for these cases, because it has few advantages over computed tomography, which is more accessible and presents a better cost-benefit ratio.

The surgical management of mediastinal schwannomas located is performed based on the images obtained through computed tomography or magnetic resonance imaging. These findings give reference only to intrathoracic tumors or to tumors that have invaded the vertebral canal.⁽¹⁴⁾

Video-assisted surgery was widely used in the 1980s after the technological improvement and consolidation of video-assisted laparoscopy.⁽¹⁴⁾ It was easily adapted to mediastinal biopsies and, later, to the resection of masses. The patient is positioned as for lateral thoracotomy, with the camera (preferentially) introduced into the fifth intercostal space, posteriorly for masses in the anterior mediastinum and anteriorly for masses in the posterior mediastinum. The other accesses are positioned according to the location of the mass. For anterior mediastinal masses, the accesses are created over the second or third intercostal space, on the midaxillary line and over the fifth or sixth intercostal space, on the anterior axillary line. A fourth access is created over the seventh intercostal space, between the anterior axillary and midaxillary lines. This access allows the use of scissors or clamp forceps, as well as permitting lung traction, which facilitates the resection. In posterior mediastinal masses, the additional accesses are created between the anterior axillary and midaxillary lines, between the third and fourth intercostal spaces. The lung retraction is performed with forceps inserted between the fourth and sixth spaces, along the anterior axillary line.⁽¹⁴⁾

In the literature, there are few descriptions of schwannomas being resected using video-assisted thoracoscopy. Access is better in schwannomas of intercostal origin.⁽¹⁰⁾ Motivations for performing resection using video-assisted thoracoscopy include biopsy (to rule out malignancy), removal (to prevent malignancy), which is rare, as well as to relieve compressive symptoms and to avoid the growth of the tumor into the foramen of the bone marrow. The technique is relatively simple, although care must be taken when maneuvering the tumor in relation to the proximal vascular and mediastinal structures.

In the majority of the published cases in which video-assisted thoracoscopy alone was used for the removal of mediastinal masses, a high degree of success was obtained,⁽¹⁻⁸⁾ demonstrating the safety of the procedure in the hands of well-trained surgeons. When compared to thoracotomy, video-assisted thoracoscopy requires smaller incisions, thereby resulting in less pain, fewer lung complications, shorter hospital stays, more rapid recovery (return to normal activities) and less aesthetic damage.^(2-3,6-7,9-10,15)

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