

## Case report

## Surgery for posterior mediastinal dumbbell tumors: A case report

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## HIGHLIGHTS

- A woman was diagnosis recurrent mediastinal dumbbell-shaped nerve sheath tumor.
- However, pathological examination showed mixed hemangioma.
- During the procedures, the intrathoracic component can be resected by biportal thoracoscopy in a prone position; however, removal of the intraspinal tumor was incomplete because of copious bleeding.
- If the diagnosis of dumbbell tumor is not conclusive, an endoscopic biopsy should be performed before removing the tumor.

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## ABSTRACT

**Introduction:** Mediastinal dumbbell tumors are rare, and special cases provide valuable knowledge to the existing literature.

**Presentation of case:** A 57-year-old woman was diagnosed with a recurrent dumbbell-shaped nerve sheath tumor with intrathoracic and intraspinal components. We attempted to resect the tumor via combined biport thoracoscopy and laminectomy with the patient in a prone position. However, copious bleeding prevented complete removal of the intraspinal component of the tumor. Pathological examination of the operative specimens showed a mixed hemangioma.

**Discussion:** The first report on the use of triportal thoracoscopy for treatment of a posterior mediastinal dumbbell tumor with the patient in the prone position was published in 1995. However, this technique is not widely used. The technique used in our case is unique only in that biportal rather than triportal thoracoscopy was used to resect the intrathoracic component of the tumor. The differential diagnoses of posterior mediastinal dumbbell-shaped tumors include neurogenic tumors, meningiomas, and hemangiomas. Very rarely, cavernous and capillary hemangiomas also present as dumbbell-shaped lesions. To our knowledge, a mixed hemangioma presenting as a dumbbell-shaped lesion has not been previously reported.

**Conclusion:** The intrathoracic component of a posterior mediastinal dumbbell tumor can be resected by biportal thoracoscopy with the patient in a prone position, reducing the operative time. If the diagnosis of a dumbbell tumor is inconclusive, an endoscopic biopsy should be performed before removing the tumor.

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## 1. Introduction

Mediastinal dumbbell tumors are rare, and reports of cases add valuable information to the existing literature. We herein report a case involving a patient with a posterior mediastinal dumbbell

tumor and describe a surgical technique for removal of such tumors.

## 2. Presentation of case

A 57-year-old woman was referred to our hospital because of progressive leg weakness. She had undergone spinal surgery 12 years previously for what was believed to be a dumbbell nerve sheath tumor; however, pathologic material could not be obtained from the tumor. Therefore, a diagnosis of recurrent nerve sheath

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tumor was made. Magnetic resonance imaging showed a mass in the upper field of the right chest and intraspinal canal at T4 and T5, and the lesion was determined to be an intrathoracic and intraspinal dumbbell-shaped tumor (Fig. 1).

### 2.1. Surgical technique

The patient was intubated with a double-lumen endotracheal tube under general anesthesia and placed in the prone position (Fig. 2).

#### 2.1.1. First phase: removal of intraspinal tumor

After induction of anesthesia, a laminectomy was performed at the level of the tumor with the patient in the prone position. Enough bone was removed to expose the intraspinal tumor and widen the laminectomy on the side of the tumor; this allowed the performance of an intervertebral foraminotomy where the tumor narrowed to pass into the chest cavity. Unfortunately, the intraspinal tumor was not completely removed because of copious bleeding during the laminectomy, necessitating transfusion of 5000 mL of blood.

#### 2.1.2. Second phase: removal of the intrathoracic tumor

After the intraspinal tumor had been removed to the greatest extent possible, a biportal thoracoscopy setup was prepared. One port was placed in the seventh intercostal space on the mid-axillary line for a camera, and another was placed in the fourth intercostal space on the posterior axillary line. During the procedure, the lung on the operative side was found to be suboptimally deflated. Accordingly, a Veress needle was inserted into the pleural cavity and CO<sub>2</sub> insufflated to 8 cmH<sub>2</sub>O to provide adequate exposure of the operative field. The pleura was incised around the tumor using

an ultrasonic scalpel (Fig. 2). As dissection proceeded deeper into the extrapleural tissue, all vessels feeding the tumor were cauterized. After the tumor had been removed through the working port, a chest tube was inserted and the ports closed.

#### 2.1.3. Outcome

Although the intrathoracic component of the tumor was completely removed (Fig. 3), the intraspinal tumor was incompletely removed because of copious bleeding. Pathological examination of the operative specimens showed a mixed hemangioma (Fig. 4). The patient did not recover her lower limb function.

### 3. Discussion

Most posterior mediastinal dumbbell tumors are benign. Safe removal of these tumors requires a one-stage combined neurosurgical and thoracic operation. Various types of incisions and different patient positions have been described. Minimally invasive approaches using video-assisted thoracic surgical techniques have recently become routinely used for treatment of intrathoracic disease. For most video-assisted thoracic surgery, patients are placed in the lateral decubitus position. Safe resection of posterior mediastinal dumbbell tumors using video-assisted thoracoscopy with the patient in the lateral decubitus position has been described [1]. However, the need to reposition the patient from the prone to lateral decubitus position after the spinal component of the tumor has been removed is very inconvenient.

Although the prone position is very popular for spinal surgery, it is seldom used in video-assisted thoracic operations. In 1995, McKenna et al. [2] published the first report on the use of thoracoscopy to treat a posterior mediastinal dumbbell tumor with the patient in the prone position to avoid repositioning and reduce the

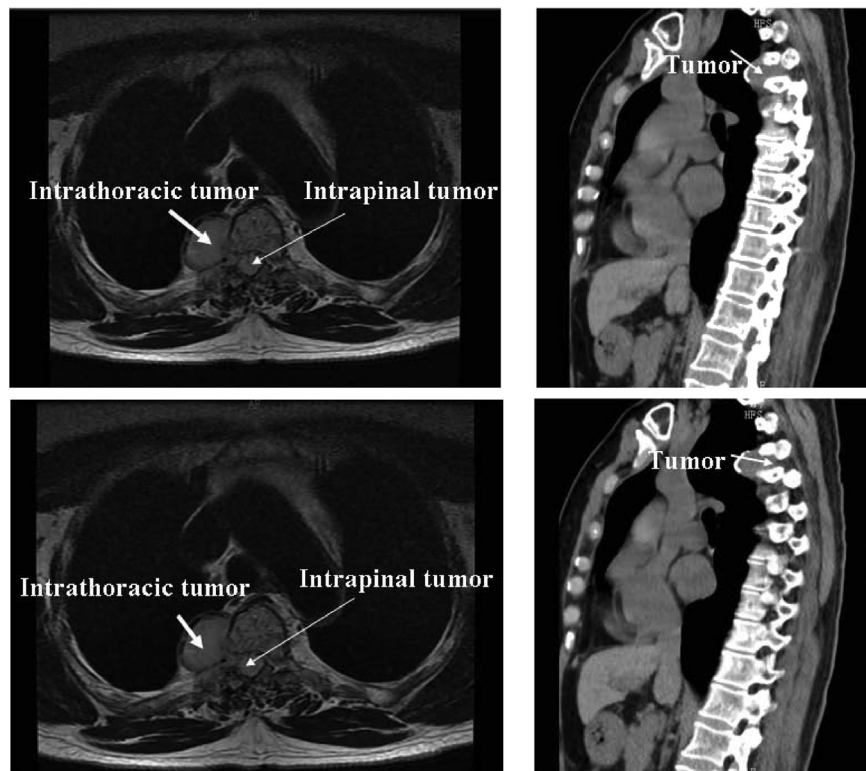


Fig. 1. Magnetic resonance image showing a posterior mediastinal dumbbell tumor.

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