


CASE REPORT

Lower posterior mediastinal benign schwannoma successfully resected with retroperitoneoscopy using a transdiaphragmatic approach: A case report

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Abstract

Lower posterior mediastinal tumors are traditionally excised by conventional thoracotomy or thoracoscopic approaches; however, use of the transdiaphragmatic retroperitoneoscopic approach for these tumors has rarely been reported. Herein, we report a case of a left lower posterior mediastinal paravertebral benign schwannoma in an adult male that was successfully treated with transdiaphragmatic retroperitoneoscopic surgery. The patient presented with no symptoms but had noticed a lesion in the left lower posterior mediastinum two months prior. He underwent transdiaphragmatic retroperitoneoscopic surgery with total resection of the mediastinal mass. To the best of our knowledge, this is the most detailed and challenging case of transdiaphragmatic retroperitoneoscopic surgery to treat a schwannoma in the left lower posterior mediastinum reported to date.

Introduction

Schwannoma is a rare tumor originating in the Schwann cells that surround peripheral nerve fibers. Less than 9% of schwannomas occur in the mediastinum, and this tumor is a relatively common mediastinal neurogenic tumor.¹ Schwannomas are typically benign, slow growing, and well encapsulated. Pathological examination is required to diagnose schwannomas. Immunohistochemical analysis and electron microscopy may aid the final diagnosis.²

Although video-assisted thoracic surgery is recommended as the standard procedure for posterior mediastinal benign neurogenic tumors, herein, we report the first case of a case of a left lower posterior mediastinal paravertebral benign schwannoma successfully treated with transdiaphragmatic retroperitoneoscopic surgery.

Case report

An asymptomatic 65-year-old man presented with a lesion that had been incidentally detected two months prior. Computed tomography (CT) images showed a left lower

posterior mediastinal paravertebral tumor measuring 4.2×3.0 cm with no observed direct invasion to any adjacent structures. The oval-shaped tumor had a smooth and clear edge and roughly uniform density, with a CT value of approximately 0 HU. It was located in the left posterior region of the descending aorta (Fig 1a). The patient denied having any symptoms, such as fever, cough, or pain. His medical and family history of disease was unremarkable. Upon admission, his physical examination and blood and urine evaluations were also unremarkable. CT imaging revealed that the tumor was located in the mediastinum (Fig 1b), and there was no blood vessel connection with the descending aorta (Fig 1c); thus, pulmonary sequestration was excluded. The patient's symptoms, signs, and CT images also excluded enlarged lymph nodes and lymphomas. The preoperative diagnosis was a neurogenic tumor. Considering the position and benign nature of the lesion, we planned a transdiaphragmatic retroperitoneoscopic resection of the left lower posterior mediastinal tumor.

The patient lay in a modified flank position under general anesthesia.³ The retroperitoneal space was expanded

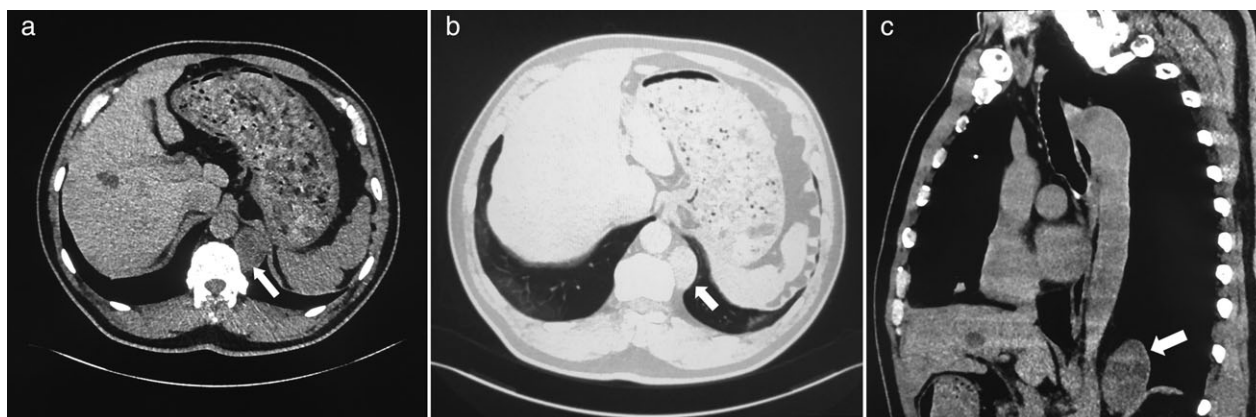


Figure 1 (a) Computed tomography image showing a left lower posterior mediastinal paravertebral tumor measuring 4.2 × 3.0 cm in diameter (arrow). No direct invasion of the tumor to any adjacent structures was observed. (b) The tumor (arrow) was located in the mediastinum. (c) No blood vessel connection was observed between the tumor (arrow) and the descending aorta.

with an in-house balloon dilatation apparatus, and the trocar was placed as previously reported.⁴ A 30° angle laparoscopy was used during the procedure. The pressure of the cavity was maintained at 10–14 mmHg. The Gerota's fascia was opened, and further dissections were all conducted in the non-vascular plane between the renal fat capsule and the Psoas muscle. Care was taken to avoid injury to the renal artery. After wide dissection in the plane, we located the lesion at the midline end of the arcuate line of the diaphragm and under the diaphragm muscle. The diaphragm was longitudinally cut to reveal the whole mass (Fig 2a). Separation was conducted primarily by blunt dissection. In total, four nerve roots were cut with a Harmonic scalpel. The mass was completely removed (Fig 2b). The urologist and the anesthetist both confirmed the lack of pleural injuries from retroperitoneal examination and respiratory parameters. The incision to the diaphragm was then closed with a 2-0 barbed suture using a running method (Fig 2c). A retroperitoneal drainage tube was placed through the trocar point of the anterior axillary line. The operation lasted 50 minutes. In total, 500 mL normal saline and 250 mL 6% hydroxethyl starch 130/0.4 mL were provided, and urine

volume was 300 mL. No obvious blood loss occurred. The drainage was removed after two days, and the patient was discharged three days after the operation. No complications were recorded. Pathologic analyses of the resected specimen revealed a benign schwannoma.

Discussion

Video-assisted thoracic surgery is recommended as the standard procedure for posterior mediastinal benign neurogenic tumors because these lesions are well encapsulated.⁵ The less invasive nature of the thoroscopic approach is associated with fewer postoperative complications, improved cosmetic appearance, accelerated recovery, and better survival than open thoracotomy.^{6,7} However, compared with the laparoscopic approach, the thoroscopic approach is associated with increased anesthetic morbidity.⁶ We decided to perform transdiaphragmatic retroperitoneoscopic surgery to excise this lower posterior mediastinal tumor because of its anatomic location and our familiarity with the approach. This approach can avoid the need for placement of a double-lumen endotracheal

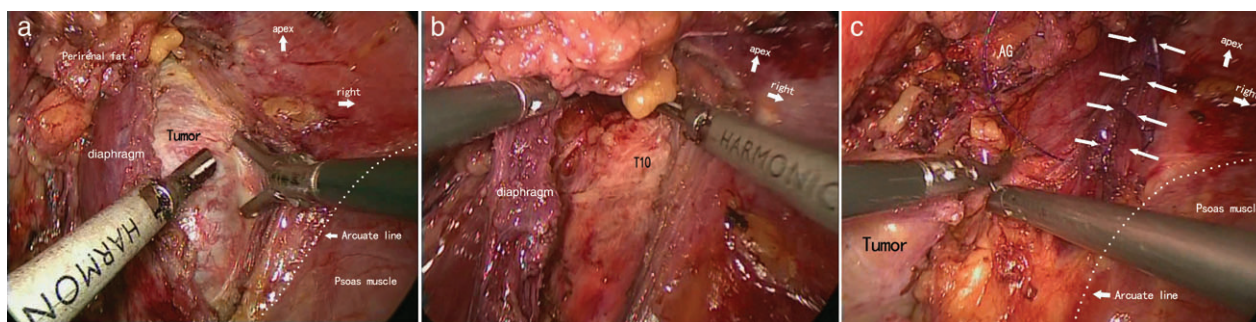


Figure 2 (a) Laparoscopic photograph of the mass at the midline end of the arcuate line of the diaphragm and under the diaphragm muscle. Apex, patient's apex; right, patient's right. (b) The mass was completely isolated from the left pleura. T10, tenth thoracic vertebra. (c) The diaphragm muscle was reconstructed via continuous suturing with barbed sutures (arrow). AG, adrenal gland.

tube and single-lung ventilation.⁸ A postoperative chest tube is required only in selected cases in which the pleura is violated. In this special clinical situation, compared with more conventional thoracic procedures, the laparoscopic approach can decrease morbidity and improve postoperative recovery. However, because the operating space is relatively narrow, it is necessary to familiarize oneself with anatomical landmarks, effectively identify the renal artery and adrenal gland, and avoid damaging these tissues when using this technique. In addition, a meticulous technique and experience with advanced laparoscopy are mandatory before attempting such an approach in specific cases. Further studies are needed to confirm the long-term success rates of the laparoscopic approach in these cases, although the rarity of these tumors will make such studies difficult.

In conclusion, our experience showed that retroperitoneoscopic resection of a lower posterior mediastinal benign schwannoma using a transdiaphragmatic approach can be safely applied in a select group of patients.

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Disclosure

No authors report any conflict of interest.

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