Endoscopic Resection of Thoracic Paravertebral and Dumbbell Tumors

OBJECTIVE: Neurogenic paravertebral tumors are uncommon neoplasms arising from neurogenic elements within the thorax. These tumors may be dumbbell shaped, extending into the spinal canal or exclusively paraspinal. Generally encapsulated, they are located in the posterior mediastinum. In this report, we present our experience in the thoracoscopic resection of these tumors, including surgical technique and potential pitfalls.

METHODS: A retrospective review of patients undergoing endoscopic surgery for paravertebral tumors was undertaken. Patient demographics, charts, operative reports, and pre- and postoperative images were reviewed.

RESULTS: Between 1997 and 2004, 13 patients were treated thoracoscopically for paravertebral tumors in our departments. Our population consisted of four men and nine women. The median age was 44.9 years (range, 29–66 yr). Eight patients presented with pain, dyspnea, cough, and weakness. Five patients had tumors found incidentally. Sizes of the tumors varied from 3 to 9 cm. Final pathology included four neurofibromas, eight schwannomas, and one unclassified granular cell tumor. Gross total resection was achieved endoscopically in all cases. Three patients required a hemilaminectomy for resection of the intraspinal dumbbell component of the tumor during the same operation. The mean operative time was 229.5 minutes. The mean estimated blood loss was 371.1 ml. Postoperative morbidities included one each of tongue swelling, ulnar neuropathy, and intercostal hyperesthesia. The mean hospital stay was 2.8 days.

CONCLUSION: Paravertebral tumors in the posterior mediastinum are amenable to endoscopic removal, even in hard to reach locations. Tumors with intraspinal extension can be removed concurrently by performing a hemilaminectomy, followed by thoracoscopy, without the need for a thoracotomy.

KEY WORDS: Dumbbell, Paravertebral tumors, Thoracoscopic surgery


Neurogenic paravertebral tumors are uncommon neoplasms that can arise from neurogenic elements within the posterior mediastinum (6, 9). These tumors are generally broken down by their neural cell of origin into nerve sheath origin (schwannomas and neurofibromas), autonomic ganglion origin (ganglioneuromas and neuroblastomas), and paraganglionic origin (paragangliomas and pheochromocytomas). Although uncommon, they represent approximately 75% of posterior mediastinal masses and 10 to 34% of all mediastinal tumors (15). Fortunately, more than 95% of neurogenic paravertebral tumors are benign (9, 12).

Posterior thoracotomy has been the traditional surgical approach for removing these tumors (3). Video-assisted thoracoscopic surgery (VATS) has been previously documented as a safe and effective method for excising these tumors (5, 8, 9, 13). Previously published contraindications to the treatment of these tumors with VATS include large tumors (>8 cm), intraspinal extension (“dumbbell tumors”), location in the upper and lower reaches of the thoracic cavity, and previous thoracic surgery. Tumors at the apex of the chest cavity in close proximity to the great vessels, the aorta, and the stellate ganglion (Fig. 1) carry an increased risk of vascular injury and