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Resection of posterior mediastinal tumors by video assisted thoracic surgery

Taimur Asif Ali
Aga Khan University

Saulat Hasnain Fatimi
Aga Khan University, saulat.fatimi@aku.edu

Syed Saad Naeem
Apartment No. 79-G, Street 19, Askari 4, Army Housing Scheme, Karachi

CASE REPORT

Resection of Posterior Mediastinal Tumors by Video Assisted Thoracic Surgery

Taimur Asif Ali, Saulat Hasnain Fatimi and Syed Saad Naeem

Abstract

This case report illustrates successful Video Assisted Thoracic Surgery (VATS) performed on a 45-year-old woman and 52-year-old man presenting with a mass in left and right paravertebral space on the CT scan respectively. VATS has many benefits over traditional open operation (thoracotomy), resulting in less pain and shorten recovery time. However, VATS has higher equipment cost but when an experienced surgeon performs the surgery, better outcomes are achieved. VATS is not common in Pakistan's surgical setup as it is an expensive method of eradicating mediastinal pathologies and not every patient undergoes VATS. The primary objective of presenting these cases is to promote the use of VATS specifically for removal of posterior mediastinal tumors and improve the surgical outcomes.

Key Words: *Video assisted thoracic surgery (VATS). Paravertebral space. Posterior mediastinal tumors.*

INTRODUCTION

Video Assisted Thoracic Surgery (VATS) has gradually become the modality of choice in the diagnosis and treatment of intra-thoracic neoplastic pathologies in developed countries that previously required sternotomy and open thoracotomy.[1] It refers to thoracic surgery that is performed by insertion of instruments through many small chest incisions under two dimensional video images.[2] The potential advantages of VATS include less postoperative pain, fewer operative complications, shortened hospital stay and reduced cost.[3] Major role of VATS is in the resection of posterior mediastinal tumors as the morbidity associated with this procedure is minimal as compared to open thoracic surgery.[4] However, due to lack of skilled personnel and appropriate facilities, it is not widely practiced in developing countries such as ours.

We present two recent cases of mediastinal tumors which were successfully treated at the Aga Khan University Hospital using VATS.

CASE REPORT

Case 1: A 45-year Asian woman with a history of back pain just below the angle of the scapula on the right side was admitted to our Hospital in Karachi, Pakistan. There were no associated symptoms and the past medical history was unremarkable. On examination, she was a thin-built woman with normal physical findings. Chest X-ray showed a mass in the posterior mediastinum that was confirmed by the CAT scan of chest. It was a well circumscribed mass about 4 x 4.5 cm in the left lower paravertebral area in the left chest highly suggestive of nerve sheath tumor. The posterior mediastinal tumor was removed through Video Assisted Thoracoscopy (VATS) under general anesthesia through double lumen endotracheal tube. Three 10-mm ports were used revealing a well-circumscribed vascular lesion that was resected *en bloc* with macroscopically clear margins. As the lesion was considered to have a highly vascular nature, percutaneous histological sampling was avoided.

The surgical pathology confirmed it to be a well encapsulated glomus tumor. There were no intra-operative or postoperative complications and the patient was discharged home. Her symptoms resolved completely and the patient remained symptom-free 12 months subsequent to surgery, with no evidence of local recurrence, confirmed by CAT scan.

Case 2: The second case was a 52-year man referred to our Hospital with an abnormal opacity on his chest X-ray. He complained of upper back and right sided neck pain, with no other associated symptoms. The past medical history was unremarkable. On examination, he was a well built man with normal physical findings. A computed tomography scan revealed a well circumscribed mass measuring approximately 3 x 3 cm on the right posterior mediastinum in the paravertebral area at the thoracic inlet. The mass was highly suggestive of a nerve sheath tumor. The mass was completely isolated via VATS, without intrasurgical complications. The biopsy showed that the lesion, consisting of encapsulated elastic tissue, with glossy gray stripes, was a schwannoma. The patient was discharged with no symptoms 3 days after the procedure and on 6-month follow-up, there was no recurrence on CAT scan.

Department of Surgery, Division of Cardiothoracic Surgery, The Aga Khan University Hospital, Karachi.

Correspondence: Dr. Syed Saad Naeem, Apartment No. 79-G, Street 19, Askari 4, Army Housing Scheme, Karachi.
E-mail: naeem.syedsaad@gmail.com

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DISCUSSION

Video-Assisted Thoracic Surgery (VATS) is widely used to remove small posterior mediastinal tumors such as neurogenic tumors, thymic cysts, and bronchogenic cysts.[5] Majority of neurogenic tumors in adults are benign, however, a greater percentage of neurogenic tumors are malignant in children. Many of these tumors are discovered incidentally in asymptomatic patients on routine films. Consequently, they can cause chest and back pain (due to compression or invasion of inter-costal nerves, bone and chest wall), cough and dyspnea (due to compression of trachea-bronchial tree), Pancoast syndrome and Horner's syndrome, due to involvement of the brachial and cervical sympathetic chain respectively.[5] These tumors may cause neurological and systemic symptoms due to release of catecholamines, vasoactive intestinal polypeptides and insulin-like factors. As the main symptomatology of tumors is because of local compression effects, resection is the treatment of choice.[5]

Previously, open thoracic surgery via postero-lateral thoracotomy was done considering their strategic position in the mediastinum, but with the advances in technology and imaging devices, VATS is now becoming a widely accepted treatment modality for mediastinal pathologies, including posterior mediastinal tumors.[6] A study conducted in Japan reports of 13 patients who underwent successful resection of mediastinal tumors using VATS.[5]

VATS bypasses the morbidity caused by postero-lateral thoracotomy, which may be in the form of pain, movement restriction or disturbed cosmesis.[7] The duration of hospital stay is markedly decreased which relieves a major financial burden, reduces chances of nosocomial infections and hospital induced psychosis. Complications like bleeding and creation of large subcutaneous pouches can be prevented by using VATS as it makes use of three ports of entry without extensive mobilization of adjacent subcutaneous tissue.

A few contraindications to using VATS in the resection of posterior mediastinal tumors are tumor size > 5 cm, dumbbell tumor or a tumor with mediastinal invasion.[8] However, Venissac and his team from the University of NICE, France, showed that although tedious, dumbbell tumors could be resected by preceding VATS by laminectomy, applying a double team effort.[9] Takeo *et al*. thoracoscopically removed a giant mediastinal tumor with a diameter of 18 cm.[10] Currently, awake-VATS resection of solitary pulmonary nodules is being easily and safely performed under Thoracic Epidural Anesthesia (TEA) with zero mortality and negligible morbidity.

Strategies should be designed to reduce the cost in the practice of VATS. Cost containing interventions include careful patient selection, use of conventional thoracic instruments, and modification of conventional instruments, limited use of expensive consumables, and development and application of endoscopic suturing technique. VATS is still in progress in our country and therefore, cost containment should be our top most priority if this new surgical technique is to be applicable here. From analysis, it is clear that video-assisted thoracic surgery has a higher initial cost. Whether this is balanced by a more rapid discharge remains to be proven at our hospitals. There is a definite need for high-quality prospective randomized studies in future.

REFERENCES

1. He J, Shao W, Cao C, Yan T, Wang D, Xiong Xg, *et al.* Long-term outcome and cost-effectiveness of complete versus assisted video-assisted thoracic surgery for non-small cell lung cancer. *J Surg Oncol* 2011; **104**:162-8.
2. Van Schil P. Cost analysis of video-assisted thoracic surgery versus thoracotomy: critical review. *Eur Respirat J* 2003; **22**: 735-8.
3. Yim A. Cost-containing strategies in video-assisted thoracoscopic surgery. *Surg Endoscop* 1996; **10**:1198-200.
4. Newton PO, Marks M, Faro F, Betz R, Clements D, Haher T, *et al.* Use of video-assisted thoracoscopic surgery to reduce perioperative morbidity in scoliosis surgery. *Spine* 2003; **28**: S249-S54.
5. Tsubochi H, Endo S, Nakano T, Minegishi K, Tetsuka K, Hasegawa T. Extraction of mediastinal teratoma contents for complete thoracoscopic resection. *Asian Cardiovasc Thorac Ann* 2015; **23**:42-5.
6. Brodsky JB, Cohen E. Video-assisted thoracoscopic surgery. *Curr Opin Anesthesiol* 2000; **13**:41-5.
7. Yoshimura N, Yamaguchi M, Oshima Y, Oka S, Ootaki Y, Yoshida M. Repair of atrial septal defect through a right posterolateral thoracotomy: a cosmetic approach for female patients. *Annals Thora Surg* 2001; **72**:2103-5.
8. Sellke F, del Nido PJ, editors. Sabiston and Spencer's surgery of the chest: expert consult Philadelphia, Pennsylvania: *WB Saunders;* 2005.
9. McKenna RJ Jr, Maline D, Pratt G. VATS resection of a mediastinal neurogenic dumbbell tumor. *Surg Laparos Endoscop* 1995; **5**:480-2.
10. Takeo S, Fukuyama S. Video-assisted thoracoscopic resection of a giant anterior mediastinal tumor (lipoma) using an original sternum-lifting technique. *Japanese J Thorac Cardiovasc Surg* 2005; **53**:565-8.