

A Preferred Approach in Diagnosis and Treatment: VATS

Tanı ve Tedavide Tercih Edilen Yöntem: VATS

İsmail Cüneyt Kurul¹, Muhammed Sayan¹, İlknur Aytekin¹, Kerim Tülüce¹, Şevki Mustafa Demiröz¹, Ali Çelik², İrfan Taştepe¹

¹Department of Thoracic Surgery, Faculty of Medicine, Gazi University, Ankara, Turkey

²Clinic of Chest Diseases and Thoracic Surgery, Atatürk Training and Research Hospital, Ankara, Turkey

ABSTRACT

Objective: VATS (video-assisted thoracic surgery) is commonly used for variable indications in thoracic surgery procedures such as pleural biopsy and lung resections. The use of VATS in our clinic for various diseases was reviewed.

Methods: The files of 45 patients that underwent VATS were assessed retrospectively between May 2009 and March 2011. Cases consisted of 21 males and 24 females; the age range was 15 to 72 years and the mean age was 53.5 years.

Results: Fifty-one operations were performed on the 45 cases. A total of six cases, including five cases of hyperhidrosis and one case of pleural effusion, underwent simultaneous bilateral operations. VATS was performed for pleural effusion and/or pleural thickening in 23 cases, for a lung nodule or lung mass in 13, for pneumothorax and prolonged air leak in four, and for hyperhidrosis-sympathetic hyperactivity in five cases. The pathological analyses of 16 patients with pleural effusion indicated malignant disease while seven patients had benign findings. Nine of the patients with pulmonary nodules were reported as benign while four were reported as malignant by pathology. In one patient who underwent wedge resection for pneumothorax, prolonged air leakage occurred and the patient underwent reoperation. Death occurred in one patient.

Conclusion: VATS is used for diagnostic and therapeutic purposes in the practice of thoracic surgery. It is the preferred method for selected patients. (*Gazi Med J 2012; 23: 10-2*)

Key Words: Surgical procedures, minimally invasive, thoracic surgery, video-assisted, thoracoscopy

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ÖZET

Amaç: VATS (Video Yardımlı Göğüs Cerrahisi) göğüs cerrahisi işlemlerinde, plevral biyopsi, akciğer rezeksiyonları gibi değişik endikasyonlar ile yaygın olarak kullanılmaktadır. Kliniğimizde çeşitli hastalıklarda VATS uygulanan cerrahiler gözden geçirildi.

Yöntemler: Mayıs 2009-Mart 2011 tarihleri arasında VATS uygulanan 45 hastanın kayıtları retrospektif olarak değerlendirildi. Hastaların 21'i erkek, 24'ü kadın idi. Yaşları 15-72 arasında değişmekteydi (ortalama yaş 53.5).

Bulgular: Kırk beş hastaya 51 operasyon yapıldı. Plevral efüzyon ve/veya plevral kalınlaşma nedeniyle 23, akciğerde nodül veya kitle nedeniyle 13, pnömotoraks veya uzamış hava kaçağı nedeniyle 4, hiperhidrozis ve sempatik hiperaktivite nedeniyle 5 olguya VATS yapıldı. Plevral efüzyonu olan hastaların 16'sında malign, 7'sinde ise benign patoloji saptandı. Pulmoner nodülü olan 9 hastada patoloji benign, 4 hastada ise malign olarak raporlandı. Pnömotoraks nedeniyle wedge rezeksiyon yapılan bir hastada uzamış hava kaçağı oldu ve tekrar opere edildi. Mortalite bir hastada görüldü.

Sonuç: VATS göğüs cerrahisi pratiğinde tanıs ve tedavi amaçlı kullanılmaktadır. VATS uygun hastalarda tercih edilecek bir yöntemdir. (*Gazi Med J 2012; 23: 10-2*)

Anahtar Sözcükler: Cerrahi işlemler, minimal girişimsel, göğüs cerrahisi, video yardımcı, torakoskopi

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Address for Correspondence / Yazışma Adresi: Dr. Ali Çelik, Clinic of Chest Diseases and Thoracic Surgery, Atatürk Training and Research Hospital, Ankara, Turkey Phone: +90 530 404 54 67 E-mail: alicelik78@gmail.com

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INTRODUCTION

VATS (video-assisted thoracic surgery) is currently used widely in the practice of thoracic surgery. VATS was defined for the first time in 1910 by Jacobaeus as the application of thoracoscopy by means of a cystoscope. It is performed increasingly and successfully worldwide due to its advantages such as reduced surgical trauma resulting in less pain, shortened hospital stay and cosmetic considerations (1). Nowadays, along with its expanded indications, VATS has become an accepted method for many thoracic surgery procedures such as pleura, lung, mediastinum and oesophagus surgery (2). In this study, the use of VATS surgery in our clinic for the purposes of diagnosis and treatment in various diseases was reviewed.

MATERIALS AND METHODS

The files of 45 patients that underwent VATS for various indications were assessed retrospectively between May 2009 and March 2011 in our Department of Thoracic Surgery, School of Medicine. Routine case preparation including preoperative respiratory function tests, ECG, bidirectional chest radiogram, determination of blood group and CBC tests were performed in all cases. All cases except the sympathectomy group were evaluated by thorax computed tomography (CT) imaging. Cases consisted of 21 males and 24 females; the age range was 15 to 72 years and the mean age was 53.5 years. All patients underwent single lung ventilation under general anaesthesia via the double lumen intubation tube. All cases were extubated after the procedure. One patient was admitted to the intensive care unit while the others were referred to the clinic.

RESULTS

Fifty-one operations were performed on the 45 patients. A total of six cases, including five hyperhidrosis cases and one case of pleural effusion, underwent simultaneous bilateral operation. Forty

patients were approached from the lateral decubitus position and five patients underwent bilateral thoracic sympathectomy in a semi-sitting, semi-Fowler position.

VATS was performed for pleural effusion and/or pleural thickening in 23 patients (51.1%), for a lung nodule or lung mass in 13 patients (28.8%), for pneumothorax and prolonged air leak in four cases (8.8%) and for hyperhidrosis-sympathetic hyperactivity in five cases (11.1%).

Seven of the 23 patients with pleural effusion had concomitant intra-abdominal malignancy. VATS was performed for staging and for guiding treatment. All cases of pleural effusion underwent thoracentesis and were previously undiagnosed by cytology. All patients with pleural effusion underwent pleural biopsy. The pathological assessment determined that 16 patients had malignant disease and seven patients had benign findings (Table 1). Bilateral VATS and parietal pleural biopsy were performed in the same session on one case who was diagnosed with an abdominal malignancy and had bilateral effusion in order to evaluate diaphragm involvement. One patient who developed postoperative respiratory failure was readmitted to the clinic after being monitored for two days in the intensive care unit due to the re-expansion of pulmonary oedema; all the other patients were admitted to the clinic after the procedure.

Wedge resections were performed on 13 cases that were found to have a single or multiple lung nodule on thorax CT, or had radiological findings of interstitial lung disease undiagnosed by other methods such as bronchoscopy or transthoracic needle biopsy. Attention was paid to removing samples up to 5 cm in width from the normal field out of the densely involved area along with the involved area in cases of suspected interstitial lung disease. Nine of those cases were reported as benign while four were reported as malignant by pathology (Table 1).

Endostapler-assisted wedge resection and apical pleurectomy were applied to the bullous area in four cases that had pneumothorax and prolonged air leak. The patients without any postoperative problems were admitted to the service and three patients were dis-

Table 1. Aetiology and histopathological classification of cases

Aetiology (No.)	Histopathology	N (cases)	%
Pleural effusion (3)	Epithelioid malignant mesothelioma	3	7.5
Pleural effusion (2)	Biphasic type malignant mesothelioma	2	5
Pulmonary nodule (3) and Pleural effusion (7)	Metastatic adenocarcinoma	10	25
Pulmonary nodule (4)	Interstitial pneumonia	4	10
Pleural effusion (7)	Chronic fibrinous pleuritis	7	17.5
Pleural effusion (1)	Squamous cell carcinoma	1	2.5
Pneumothorax (4)	Bullous-emphysematous lung parenchyma	4	10
Pulmonary nodule (1)	Respiratory bronchiolitis	1	2.5
Pleural effusion (1)	Lymphoma	1	2.5
Pleural effusion (1)	Small cell carcinoma	1	2.5
Pulmonary nodule (1)	Idiopathic pulmonary fibrosis	1	2.5
Pulmonary nodule (1)	Langerhans cell histiocytosis	1	2.5
Pulmonary nodule (1)	Primitive neuroectodermal tumour	1	2.5
Pleural effusion (1)	Undifferentiated malign tumour	1	2.5
Pulmonary nodule (1)	Congested lung parenchyma	1	2.5
Pulmonary nodule (1)	Pneumoconiosis	1	2.5

charged within approximately three days. One patient underwent minithoracotomy on account of the development of a massive air leak on the third postoperative day. Tearing was detected on the edge of the endostapler and on the endostapler line. In all cases, pathology was reported as bullous lung (Table 1). Complications occurred in only one case.

Five patients presenting with sympathetic hyperactivity, palmar and axillary hyperhidrosis underwent bilateral thoracic sympathectomy under the guidance of VATS. Of five patients, two underwent VATS through a single port while three underwent VATS with a dual port. The sympathetic chain was cut at the level of T2 and T3 on left side and T2, T3 and to the upper sections of T4 on the right side with the assistance of bipolar electrocautery. All thoracic tubes were removed from the patients before awakening and they were transported to the clinic. Pneumothorax was not detected on control chest radiograms. All patients were discharged the next day.

Death occurred in one patient. This patient had undergone VATS for diagnostic purposes due to interstitial pulmonary disease and developed pneumothorax on the fourth day after discharge on postoperative day 7. Although pulmonary expansion was obtained and no air leak was detected two days after tube thoracostomy, the patient underwent anterior thoracotomy due to the development of a massive air leak and a significant decline in the expansion of the lungs demonstrated by PA chest radiography. The area leaking air in the parenchyma of the lung had a liver-like appearance; it was repaired and pleurectomy was performed. Air leak ceased after the operation and the chest tube was removed on the fourth day. The patient developed dyspnoea and pneumothorax two days later and died due to respiratory failure on postoperative day 12. The pathology of the case was reported as idiopathic pulmonary fibrosis.

DISCUSSION

Thoracotomy, which is the standard approach of thoracic surgery practices, provides a comfortable and wide field of view. However, because of the pain and the scar tissue left after the operation, it often leads to problems. Technological developments following the direct examination of the pleural space through simple cystoscopy in 1910 have brought about minimally invasive interventional methods, due to the expectations of society, that have been used increasingly in the practice of thoracic surgery. Although VATS has had limited use in the past, it has become one of the main procedures in thoracic surgery practice today.

Current application areas of VATS include biopsies of the pleura, pericardium, lung and mediastinum, pleurodesis, pleurectomy, wedge resection of peripheral pulmonary nodules, emphysema surgery, sympathectomy and mediastinal mass resections. This procedure was first introduced in specific centres in the 1990s as well as lobectomy and pneumonectomy (2).

VATS has been used for diagnostic and therapeutic purposes in our clinic for commonly encountered diseases in thoracic surgery such as pleural effusion, bullous lung, hyperhidrosis and pulmonary nodules. VATS was used in 45 of 326 operations (13.8%) performed in our clinic within a two-year period of time.

Although thoracentesis and closed pleural biopsies are used as the first step in the diagnosis of pleural effusion and pleural thickening, their diagnostic value is low (3, 4). VATS obtained good results in 23 cases of pleural effusion and/or pleural thickening for diagnosis and directing treatment. In our study, VATS was also performed in cases of abdominal malignancy and suspected thoracic metastases. It was particularly useful in assessing diaphragm involvement. VATS has several advantages as it can be used to perform pleurodesis, it allows

more rapid recovery after decortication by opening the septa in cases of empyema and has a higher diagnostic value in pleural effusion (5).

Removal of the bullous area by the endostapler technique in the treatment of pneumothorax and prolonged air leak, as well as the apical pleurectomy procedure, have been shown to provide a significant reduction in pain, wound problems, length of hospital stay, morbidity and time to return to normal daily activity compared to thoracotomy (6). VATS was performed successfully in three of four cases. One patient who had a broad-based bullous appearance and emphysema developed a massive air leak due to VATS and underwent thoracotomy. VATS has become the first referenced method for cases of pneumothorax and prolonged air leak in most thoracic surgery clinics (7).

VATS has a high diagnostic value for nodular lesions which were undiagnosed through bronchoscopy, transthoracic biopsy and/or interstitial lung diseases defined radiologically (6). VATS and wedge resections through the endostapler technique were performed on 13 cases. Wedge resections were performed via the endostapler technique from the outside of the area seen as intense on CT and from the areas that had less involved sites, especially in cases considered to be interstitial lung disease. Particular attention was paid to the removal of normal parenchymal tissue together with the involved area.

Endoscopic thoracic sympathectomy is performed for indications such as palmar axillary hyperhidrosis, Reynaud's syndrome, Buerger's disease, refractory angina and long QT syndrome (8). In patients with hyperhidrosis, psychological problems and social phobia may arise as a result of difficulties encountered during occupational performance and the avoidance of handshaking. Patients can be treated successfully through the sympathectomy procedure with a short duration of anaesthesia and a low complication rate. In five patients, sympathectomy was performed as consecutive operations and the patients were quickly discharged without any problems. It is understood that the method used particularly for the hand is also beneficial for foot sweating. The foot sweating problem was treated in all of our patients without any additional intervention.

As a result, VATS provides advantages to the patient and the surgeon. It is a preferred method for appropriate and selected patients when considering its advantages.

Conflict of Interest

No conflict of interest was declared by the authors.

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