

Video Assisted Thoracoscopic Surgery at the Queen Elizabeth Hospital Barbados

A Smith, J Ramesh, A Harris, M Fakoory

ABSTRACT

Video assisted thoracoscopic surgery (VATS) is now an established technique for diagnostic and therapeutic intervention in patients with thoracic pathology at the Queen Elizabeth Hospital (QEH). This article reviews the experience with 50 patients over the period May 1996 to February 2003, looking at various factors and outcomes in an attempt to ascertain the viability of this procedure at this institution. It serves as a follow-up article to the publication of the initial experience in 1999 (1). There were 24 males and 26 females included in the study. Video assisted thoracoscopic surgery was used for diagnosis in 27 cases (54%), therapeutic indication in 17 cases (34%) and as both a diagnostic and therapeutic modality in six cases (12%). In 92% of cases, the operations were completed thoracoscopically with a conversion rate of 8%. The morbidity and mortality rates were 18% and 2% respectively. Video assisted thoracoscopic surgery is an effective tool for the treatment and investigation of selected thoracic pathology at the QEH with complications and mortality rates comparable to other institutions (2, 3).

Cirugía Toracoscópica Asistida por Video en el Hospital Queen Elizabeth de Barbados

A Smith, J Ramesh, A Harris, M Fakoory

RESUMEN

La cirugía toracoscópica asistida por video (CTAV) es ya una técnica establecida para el diagnóstico y la intervención terapéutica de pacientes con patologías torácicas en el Hospital Queen Elizabeth. Este artículo pasa revista a nuestra experiencia con 50 pacientes en el transcurso del periodo de mayo de 1996 a febrero de 2003, prestando atención a varios factores y resultados en un intento por corroborar la viabilidad de ese procedimiento en nuestra institución. El trabajo sirve como un artículo de seguimiento a la publicación de nuestra experiencia en el año 1999(1). El estudio abarcó 24 hombres y 26 mujeres. La CTAV se usó para el diagnóstico en 27 casos (54%), como indicación terapéutica en 17 casos (34%), tanto en la modalidad de diagnóstico como en la terapéutica en seis casos (12%). En el 92% de los casos, las operaciones fueron completadas toracoscópicamente con una tasa de conversión de 8%. Las tasas de morbilidad y mortalidad fueron 18% y 2% respectivamente. La CTAV resultó ser un instrumento efectivo para el tratamiento y la investigación de patologías torácicas seleccionadas en nuestra institución, con complicaciones y tasas de mortalidad comparables a la de otras (2) (3).

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INTRODUCTION

Video assisted thoracoscopic surgery (VATS) was first introduced at the Queen Elizabeth Hospital (QEH) in May 1996. Since then, this procedure has found increasing use in the diagnosis and treatment of a variety of thoracic pathologies.

From: Department of Cardiovascular Services, The Queen Elizabeth Hospital, Bridgetown, Barbados.

Correspondence: Dr A Smith, The Queen Elizabeth Hospital, Martindale's Road, Bridgetown, St Michael, Barbados, Fax: (246)-429-5374.

Video assisted thoracoscopic surgery has proven to be an effective addition to the armamentarium of the thoracic surgeon, with the advantage of being less invasive, with decreased length of hospital stay (4), reduced postoperative pain as compared to thoracotomy (4-7), better preservation of pulmonary function (5) and superior cosmesis. Thoracoscopic surgery is easily learnt, given appropriate training in and familiarity with open thoracic surgery. Video assisted thoracoscopic surgery requires an anaesthetist familiar with the technique of single lung anaesthesia, and the acquisition

of a number of specialized instruments. Several procedures are now carried out almost exclusively thorascopically and the adaptability of this procedure makes it well suited to the spectrum of disease in the population.

The use of VATS in pleural toilette for retained traumatic haemothoraces has been shown to reduce the length of hospital stay, cost of hospitalization and shorten the duration of tube drainage (8) and its use in the treatment of nontuberculous fibrinopurulent pleural empyemas has been shown to be as effective as thoracotomy in these patients (9, 10). The treatment of spontaneous pneumothoraces using VATS has become the standard of care, with up to 93.8% recurrence free rate in one study (11).

The aim of this study was to review the first 50 cases utilizing VATS, to ensure that the complication and mortality rates were acceptable, and to report the experience with the procedure which is not commonly utilized in the English-speaking Caribbean.

SUBJECTS AND METHODS

The data for this study was collected by means of a data sheet filled out for each patient during his or her hospital stay for the procedure. This patient sample included patients admitted as emergencies, and those referred electively from other services within the QEH.

A total of 50 patients underwent VATS between January 1996 and February 2003. The data collected included demographic data as well as indication for VATS, operative time, hospital stay, intra-operative and postoperative complications, analgesic requirements and whether there was conversion to an open procedure.

The majority of the procedures was carried out under general anaesthesia with a single lumen Portex endotracheal tube. A minority of cases was done under local anaesthesia and sedation. Where necessary, a carbon dioxide pneumothorax was induced, or a double lumen endotracheal tube with single lung ventilation was used for better visualization. The choice of anaesthesia was tailored to each individual patient with respect to the planned procedure and the respiratory function and status of the patient. The final decision on the type of anaesthesia was made by the anaesthetist in conjunction with the surgeon.

Patients were placed in the lateral decubitus position with the pathological side up. Three or four thoracoports were employed, positioned according to the site of the pathology. A rigid zero degree laparoscope was used in all patients. All cases except one had a thoracostomy tube sited postoperatively. In cases where the respiratory tract was breached (*eg* lung biopsy or resection) or where the procedure was classified as other than clean, prophylactic antibiotics were used. A second-generation cephalosporin was the prophylactic antibiotic of choice.

RESULTS

Forty-six procedures were completed thorascopically, while four required conversion to thoracotomy. Operative time was recorded for 44 of the 46 procedures completed thorascopically. Operating time varied between 15 minutes and 190 minutes with a mean of 59.6 minutes. A double lumen endotracheal tube was used in 12 cases and CO₂ pneumothorax in five cases. Local anaesthesia and sedation were used in three cases, with all other procedures being performed under general anaesthesia. The indications for VATS and the procedures performed are listed in Tables 1 and 2.

Table 1: Indications for VATS

Indication	Number of patients
Lung nodule	12
Mediastinal or hilar mass	9
Spontaneous pneumothorax	8
Pericardial effusion	4
Thoracic trauma	3
Evaluation of oesophageal carcinoma	2
Pericardial cyst	2
Lung cyst	2
Interstitial lung disease	2
Pleural biopsy	2
Bronchiolitis obliterans	1
Prolonged QT syndrome	1
Loculated pleural effusion	1
Neuralgia and palmar hyperhydrosis	1
Total	50

Table 2: Procedures performed using VATS

Procedure	Number of patients
Lung biopsy	14
Biopsy of mediastinal/hilar mass	7
Resection of lung or bulla	5
Pleural drainage and biopsy	5
Pericardial window	4
Pleural toilette	4
Evaluation of thoracic cavity	3
Excision of pericardial cyst	2
Excision of lung cyst	2
Excision of mediastinal tumour	2
Sympathectomy	2
Total	50

Blood loss was minimal except for the cases of thoracic trauma in which preoperative haemothoraces were present and one case of a vascular mediastinal tumour that bled heavily. Intra-operative complications included significant haemorrhage (one case), rupture of an infected lung cyst (one case) and laceration of the lung (one case).

Postoperative complications included residual pneumothorax in three cases, persistent air leak in six cases, and one case of fever in a patient with systemic lupus erythematosus for which no source of infection was found. The persistent air leaks resolved with the addition of suction to the thoracostomy tubes. No cases required re-operation in this study.

Cefazolin was used in 29 of the 34 cases in which prophylactic antibiotic coverage was utilized. There were no cases of wound infection.

The morbidity for this study was 18% with a mortality of 2%. The postoperative stay for the 41 patients for whom this information was available ranged from zero days (day case) to 22 days with a mean of 4.4 days.

DISCUSSION

This series has shown a wide range of uses for VATS, with morbidity and mortality rates comparable to those of other series (2). A rigid thoracoscope was used in the present study and although this allowed adequate access and visualization of the thoracic cavity, in some cases the iliac crest and ribs limited the field of view. The planned acquisition of a flexible thoracoscope will allow for better visualization of the thorax and make it increasingly easy to perform presently challenging procedures.

The single fatality was a case of a 31-year-old male with a transthoracic gunshot wound resulting in paraplegia and a haemothorax. He underwent laminectomy to remove bone spicules from his spinal cord and VATS toilette of his right pleural cavity. He died suddenly on day 15 postoperation from massive intrabronchial haemorrhage. This case raises the question of the sensitivity of VATS in detecting subtle vascular injuries. One must theorize that this patient had a damaged arteriole with either a thrombus occluding the defect, or a damaged vessel wall that subsequently ruptured. At thoracotomy, with increased handling of the thoracic structures, it is possible that such an injury might have been discovered and repaired, possibly saving this patient's life.

Although with this procedure postoperative hospital stay averaged 4.4 days, there were two patients with extended postoperative hospital stay. One patient who had a loculated right pleural effusion secondary to pneumonia, had been treated by thoracostomy tube insertion twice, once at an institution in Spain and once at an institution in Italy. At thoracoscopy, a dense lung peel was found and conversion to a limited thoracotomy with decortication was necessary. He had a postoperative air leak that resolved with suction applied to a thoracostomy tube after 19 days.

One patient who was 95-years old with complete heart block presented with a spontaneous pneumothorax and had resection of a ruptured bulla followed by a persistent air leak and subsequent placement of a permanent transvenous

pacemaker which extended his postoperative stay to 22 days. The reasons for conversion to thoracotomy were one case of heavy intra-operative bleeding in a vascular thoracic tumour, one case of a lung laceration during excision of a pericardial cyst, one case of dense pleural adhesions with a trapped lung, and one case of a mediastinal mass densely adherent to the great vessels.

In summary, video assisted thoracoscopic surgery has proven to be a useful and safe modality at QEH in the investigation and treatment of thoracic pathology. It is the procedure of choice at this institution for the investigation and toilette of the thoracic cavity in cases of haemodynamically stable chest trauma, and for the investigation and treatment of patients with spontaneous pneumothoraces. Morbidity and mortality rates were acceptable. Follow-up studies to case match VATS to thoracotomy for specific procedures, and a cost-effectiveness study are necessary to plan for rational allocation and use of limited resources as expansion into endoscopic thoracic surgery is pursued.

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