Contribution of Videothoracoscopy to the Management of the Cancer Patient

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Background: Videothoracoscopy has rapidly become a popular procedure, but its technical feasibility has been emphasized without critically evaluating its role in the management of thoracic disease. To assess the value of videothoracoscopy in the diagnosis and staging of the cancer patient and to determine if it has added to our previous standard approach of thoracoscopy performed with a mediastinoscope without video, we established a prospective database when we initiated videothoracoscopy in January 1992.

Methods: Patients were offered videothoracoscopy as an alternative to thoracotomy only if other standard approaches (e.g., needle biopsy, mediastinoscopy) were inadequate to diagnose or stage cancer or to restage patients after therapy. Parameters entered and analyzed in a prospective database were patient name; age; sex; past history; indications for videothoracoscopy; procedure type; surgical technique; whether conversion to thoracotomy was necessary, and if so, why; complications; and pathology. A complete case list of thoracoscopies performed in 1991 before videothoracoscopy was available provided historical comparison.

Results: From January 1 to December 31, 1991, 82 patients underwent thoracoscopy using a mediastinoscope for diagnosis and therapy of pleural disease. From January 1 to July 31, 1992, 160 patients (male:female = 81:79; mean age 56 years) had videothoracoscopy; 72 of 160 patients (44%) had procedures that previously would have required thoracotomy: 69 lung wedge resections, one pericardial window, one pleurectomy, one mediastinal node sampling. No major resectional procedures (e.g., lobectomy, esophagectomy) were performed by videothoracoscopy. Twenty-two percent of all patients (35 of 160), and 23% of wedge resection patients (16 of 69) required conversion to thoracotomy because videothoracoscopy was inadequate for diagnosis or staging. Reasons for conversion (multiple reasons in five patients) included further resection required in 23 patients; inability to evaluate lesion in 11; adhesions in five; and inability to tolerate one lung ventilation in two. The chest tube was in place postoperatively for a mean of 2.3 days. Thirty-day postoperative complications included ventilation for >48 h in one patient; prolonged air leak in one; pneumonia in one; arrhythmia in one; and death from progressive disease in two.

Conclusions: Although the role of videothoracoscopy in the treatment of primary thoracic malignancies and pulmonary metastases is still undefined, this early experience indicates that videothoracoscopy often enhances the ability to diagnose and stage patients by obviating thoracotomy.

Key Words: Videothoracoscopy—Cancer diagnosis—Staging.
Thoracoscopy has been used to diagnose and manage pleural disease since the early part of this century. The recent advent of video technology and of new instrumentation have revolutionized thoracoscopy by making it possible to perform major resectional procedures endoscopically. During the past 2 years, videothoracoscopy, or video-assisted thoracic surgery (VATS, as it is now commonly termed), has become increasingly popular and is rapidly becoming an integral part of the practice of thoracic surgery (1). However, attention has focused primarily on the technical feasibility of VATS, and its role in the management of thoracic malignancy has not been critically evaluated.

Thoracoscopy, performed with a mediastinoscope to diagnose pleural disease and facilitate pleurodesis, was already a common procedure at our institution before VATS was introduced. After a 3-month training period of staff members and operating room personnel during the fall of 1991, VATS was formally initiated as a standard thoracic procedure in January 1992. To assess our results and evaluate the role of VATS in the management of cancer patients, a prospective database was established at that time. This analysis encompasses our initial experience with VATS and compares it to our historical experience with thoracoscopy to determine how VATS may contribute to the diagnosis and staging of the cancer patient.

**MATERIALS AND METHODS**

**Indications for VATS**

For patients with pulmonary parenchymal disease, VATS was offered as an alternative to thoracotomy only if less invasive approaches, e.g., fine-needle aspiration or mediastinoscopy, were inadequate to diagnose or stage suspected or known malignancy. In patients with pleural disease, VATS was substituted for the older technique of thoracoscopy performed with a mediastinoscope because the use of video facilitated resident education and often provided better visualization of the pleural space.

**Operative approach**

All patients undergoing VATS were informed of the potential need to extend the procedure into a thoracotomy should complications arise or should additional exploration or resection be necessary. VATS was performed under general anesthesia using a double-lumen endotracheal tube. No carbon dioxide was insufflated into the hemithorax. Initially, all patients were monitored intraoperatively with an arterial line and a pulse oximeter. As experience was gained with VATS, arterial lines were selectively omitted. The surgical technique used was as described previously (2). The videothoracoscope was inserted into the pleural space via a thoracport placed in the mid-axillary line in the seventh or eighth intercostal space. Two additional 1.5-cm incisions, one in the anterior axillary line in the fourth or fifth intercostal space, the other in approximately the fifth intercostal space along the posterior border of the scapula, were used for the insertion of instruments. Visual inspection of the lung and pleural space in conjunction with a preoperative computed tomography (CT) scan was used to localize the lesion to be examined via biopsy or resected. A fourth incision 1–4 cm in length was added in the fifth intercostal space at the mid or posterior axillary line when it was necessary to palpate the lung or to insert more instruments. No rib spreader was used in this ancillary incision. In general, wedge resections were performed with an endoscopic stapler (Endo GIA, US Surgical Corporation, Norwalk, CT). A variety of endoscopic and standard thoracotomy instruments were used to retract the lung, lyse adhesions, perform pleural or mediastinal biopsies, and occasionally place sutures, which were tied extracorporeally. VATS was converted to a thoracotomy if the attending surgeon judged VATS to be inadequate or unsafe for diagnosis or treatment. Therefore, a definitive diagnosis was always obtained even if this required conversion to a thoracotomy. One or two chest tubes were placed at the end of the procedure and were removed postoperatively when no air leak was evident and the drainage was <150 ml/24 h.

**Clinical database**

After each VATS procedure, the attending surgeon filled out a two-page data form that included the following items: (a) patient's name, age, date of birth, medical record number, and surgeon name; (b) indications for operation; (c) factors that might increase the operative risk of VATS; (d) date and length of operation; (e) number of days the chest tube was in place and length of hospitalization; (f) description of the surgical technique used; (g) procedures performed; (h) whether conversion to thoracotomy had been necessary, and if so, why; (i) complications within 30 days of VATS; (j) type of pain medications used; and (k) final pathology.