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Although minimally invasive thoracic surgery (MITS), under various denominations, is currently the accepted approach to the management of several thoracic diseases, its use for the treatment of lung cancer and infectious conditions of surgical interest is still debated, both from a philosophic and a technical point of view. The concept of minimally invasive pulmonary resections still provokes several controversies as to the terminology, the indications, and the techniques used by different surgeons. The issue of the variability of practice in this field of MITS is addressed through an analysis of the most recent literature and the results of an international survey that was originated and devised by the European Society of Thoracic Surgeons and supported by CTSnet.

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Eric L. Grogan and David R. Jones

Lung cancer remains the leading cause of cancer death in the United States, with more than 200,000 new cases each year and 160,000 deaths. Surgical resection with an anatomic resection (typically a lobectomy) remains standard care for patients who have stage I and stage II non-small cell lung cancer. In the past 15 years, video-assisted thoracic surgery (VATS) has been used with increasing frequency worldwide to perform anatomic resections for lung cancer. This article reviews the current VATS lobectomy series and studies published since 2000 that compare VATS to open lobectomy.

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Thomas A. D'Amico

Thoracoscopic lobectomy is associated with superior outcomes, as measured by many important quality of life variables, as opposed to thoracotomy by lobectomy. Despite these proved advantages, concern has existed regarding the long-term outcomes of thoracoscopic lobectomy, which has limited its use. Review of the available literature

suggests that the long-term outcomes of thoracoscopic lobectomy are at least equivalent to, and may be superior to, conventional approaches.

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Cynthia S. Chin and Scott J. Swanson

Currently, an anatomic lobectomy or segmentectomy and complete mediastinal lymph node dissection can be achieved through two to four small incisions, without rib spreading, using videoscopic visualization. This article discusses the assimilation of this technique, video-assisted thoracic surgery lobectomy, into the practice of a thoracic surgeon and attempts to answer the question: How do we, as professionals, assure quality (defined as a proper oncologic surgery) and safety while introducing this new technology?

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Hisao Asamura

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Robert J. McKenna Jr

Launching new techniques into a medical practice involves the educational process to train surgeons about the new technique, a learning curve for surgeons as they introduce the new procedure to their patients, and comparison of the complications for the new and older techniques. This article addresses these issues, as well as the introduction of these new techniques into the practice of thoracic surgery.

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William S. Walker and Gianluca Casali

Analysis of cost issues in video-assisted thoracic surgery (VATS) lobectomy is complicated by social and health care system factors. Overall, VATS lobectomy costs are similar to open lobectomy. Operating room costs are noticeably increased but are more than offset by reduced inpatient stay with consequent generation of bed days for other cases. VATS lobectomy is one of a series of minimally invasive tools available to surgeons. With appropriate skills and resourcing, VATS resections could account for 30% of the lobectomies undertaken in most units.

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Franca M.A. Melfi and Alfredo Mussi

The past two decades have witnessed a revolutionary transition in surgical technique and technology with the development of minimally invasive approaches. Many advantages were obtained by using video-assisted thoracoscopic surgery: less surgical trauma and pain, shorter hospital stay, and satisfactory cosmetic results. Limitations still

remain, however, because of impaired vision, restricted instrument-maneuverability, unstable camera platform, and poor ergonomics for the surgeon. Some of the more prominent limitations involve the technical and mechanical nature of the equipment. This article describes technical aspects, learning curve, and complications in the field of robotic lobectomy.

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Bernard J. Park and Raja M. Flores

The financial impact of employing minimally invasive techniques for lobectomy compared with traditional open thoracotomy was assessed. A retrospective review was conducted using ICD9 codes for thoracotomy, video-assisted thoracic surgery (VATS), and robotic VATS lobectomy to determine total average costs associated with the resultant hospital stay. The difference in total average costs was calculated for each group. Robotic VATS lobectomy had higher associated costs than VATS only, primarily attributed to increased costs of the first hospital day, but was still less costly than thoracotomy. The average cost of VATS is substantially less than thoracotomy primarily because of a decreased length of stay. The cost of robotic assistance for VATS is still less than thoracotomy, but greater than VATS alone.

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Robert J. Cerfolio and Ayesha S. Bryant

This article evaluates the advantages of fast-tracking the patient who has undergone video-assisted thoracoscopic surgery instead of open thoracotomy. Key issues such as chest tube and air leak management, pain medicine protocols, psychologic advantages, and hospital length of stay are examined. It concludes that teaching, philosophy, and doctor and patient attitude may be more important than the type of surgery performed.

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Michele Salati, Alessandro Brunelli, and Gaetano Rocco

The effort to reduce the invasiveness of thoracic surgery is increasing in this specialty. In this context, preliminary evidence has shown that uniportal video-assisted thoracic surgery represents a valuable option to perform different diagnostic and curative procedures. This article addresses the topic of uniportal video-assisted thoracic surgery as the least invasive such approach that may be used to diagnose and treat several intrathoracic conditions.

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Eugenio Pompeo and Tommaso C. Mineo

General anesthesia with one-lung ventilation is considered mandatory for video-thoracoscopic pulmonary resection but has some adverse effects, which can contribute to the overall procedure-related morbidity. This finding has led to the concept of a more physiologic and globally less-invasive approach, entailing awake thoracoscopic pulmonary resection under sole epidural anesthesia. Indications, although still investigational, include resection of undetermined solitary pulmonary nodules, pulmonary metastases, and non-small cell lung cancer in high-risk patients. Preliminary results have been highly satisfactory, showing that this modality is feasible, safe, and effective. Furthermore, some evidence seems to show that this patient-friendly approach could be more cost-effective, allow a more rapid recovery, and require reduced hospitalization. Further investigation and larger prospective studies will eventually

confirm the real effectiveness and proper indications of awake videothoracoscopic pulmonary resections.

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Laureano Molins, Juan J. Fibla, Jose M. Mier, and Ana Sierra

Although there has been a significant increase in ambulatory surgery activity, there is still great potential for an increase in outpatient thoracic surgery. Video-assisted mediastinoscopy, lung biopsy, and bilateral thoracic sympathectomy can be accomplished safely in a significant percentage as ambulatory patients. The impact of the economical benefit of an outpatient thoracic surgical program over the conventional hospitalization depends on the previous department's policy on hospital stay. Further experience is needed to increase the substitution index and expand the outpatient thoracic surgical program to other procedures.

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