Thoracoscopic Surgery for Lung Cancer

Sanghoon Jheon
Professor and Chairman, Department of Thoracic and Cardiovascular Surgery, Seoul National University, Seoul, Korea

Introduction
Lung cancer is the leading cause of cancer deaths worldwide among both men and women, with more than 1 million deaths annually. Among key available therapeutic options such as surgery, chemotherapy and radiation therapy, surgery is the most potentially curative therapeutic option for this disease. When compared with conventional open thoracotomy, the minimally invasive approach known as video-assisted thoracic surgery (VATS) has become more popular because of the advantages it provides.

In terms of evidence-based medicine, VATS is currently recognized as an appropriate approach for surgical treatment of patients with early-stage non-small-cell lung cancer NSCLC. Several studies have demonstrated that minimally invasive VATS approach is not only safe and reliable, but also provides a better functional recovery with similar oncological efficacy to that achieved with conventional thoracotomy.

Functional Recovery following VATS
There is evidence which suggests VATS offers advantages over thoracotomy with respect to reduced post-operative pain, shorter hospital stay, more rapid resumption of normal daily activities, less impairment in pulmonary function, less impairment in shoulder function, reduced cytokine release, decreased time to initiation of adjuvant chemotherapy, lower incidence of complications and economic advantages. However, large scale prospective studies are needed to carry out comparative serial analysis between VATS and conventional thoracotomy to determine each method's full recovery capability with late-phase assessment.

Author, from 2009 to 2010, performed a comparative longitudinal follow-up study between VATS and conventional thoracotomy groups which focused on pain scale and pulmonary function in 132 patients who underwent lobectomy. Intervals for follow-up were 2 weeks and 1, 3, 6 and 12 months after surgery. They found statistically significant lowering of pain in patients who belonged to the VATS group at 1 month follow-up, thus indicating a faster recovery with VATS.

Oncological Efficacy of VATS

Several studies have shown superior survival data with VATS when compared with conventional thoracotomy. Yan et al. performed a meta-analysis of 21 comparative studies (two randomized and 19 nonrandomized) in an attempt to assess the safety and efficacy of VATS lobectomy. Results from this meta-analysis have shown a significant 5-year survival benefit with VATS.

However, due to the absence of well-designed large scale prospective studies which compare the two approaches, definitive evidence proving oncological superiority of the VATS approach is still lacking. But, for early stage NSCLC, we could conclude that oncologic outcome of VATS is at least not inferior to that of thora-
cotomy.

**Early Lung Cancer detection by screening and VATS**

Initial studies have demonstrated that screening computed tomography (CT) is effective in diagnosing lung cancer at an earlier stage when compared with current clinical practice. With the increased CT screening for lung cancer, small peripheral lung cancers are more frequently detected. This phenomenon places more importance on earlier lung cancer, thus naturally influencing the increased application of the VATS procedure. Recent results from the National Lung Screening Trial (NLST) have shown that screening with low-dose CT, when compared to chest radiography, reduces lung cancer mortality by 20% among high risk patients.

A total of 1154 patients with primary NSCLC underwent curative surgery at Seoul National University Bundang Hospital from 2003 to 2010. Among them, 437 patients visited the hospital because of cancer related symptoms, and 717 patients were diagnosed by screening or during a workup for other diseases. Only 30.3% of patients underwent surgery by VATS in the symptomatic group, whereas 69.9% were subjected to VATS in the screened group. In addition, ground–glass opacity (GGO) lesions detected on CT screening have the most favourable oncological behaviour compared with solid tumors. Hence, CT screening not only provides more operability and possibility of limited resection by VATS, it may even reduce the mortality among high risk lung cancer patients.

**Conclusion**

The VATS procedure is now an accepted procedure for early–stage NSCLC, showing non–inferiority over traditional thoracotomy. The demand for minimally invasive surgery using the VATS procedure is rapidly increasing, the procedure presenting advantages of primarily less pain and reduced length of hospital stay. However, to justify the expansion of surgical indications for VATS, we must expand our efforts to collect evidence and establish a consensus, which can be achieved through open and scientific discussions among thoracic surgeons and oncologists. The technological advancement of surgical instruments would also be a contributor to the expansion of its surgical indications. We also should make efforts for education, surgical quality control and communication with publics.

**References :**

Sanghoon Jheon

Professor and Chairman, Department of Thoracic and Cardiovascular Surgery, Seoul National University, Seoul, Korea

Professor Jheon graduated Kyungpook National University School of Medicine (Daegu, Korea) in 1984, receiving his Ph.D. degree in 1994. After finishing residency and his military obligations as a medical officer of the Korean Army, he started his professional carrier in 1994. Currently he is chair professor of the Department of Thoracic and Cardiovascular Surgery, College of Medicine, Seoul National University which administers the department of thoracic and cardiovascular surgery of 3 affiliated hospitals of Seoul National University College of Medicine: Seoul National University Hospital, Seoul National University Bundang Hospital and Seoul Metropolitan Government Boram Hospital. He is also an adjunct professor at the Department of Surgery, Tokyo Medical University, Japan and New Journey Cancer Hospital in Beijing, China.

He has mainly worked at Seoul National University Bundang Hospital (SNUBH) since 2003 and currently he is also serving as Chief Financial and Strategy Officer.

He is engaged in a multitude of domestic and international medical societies, and serves as on the editorial board of many medical journals. He is a member of the Academy of Medicine of Korea. He is one the only two thoracic surgeons who are members of this prestigious academy.

He initiated multicenter studies in Korea and has exerted a huge impact on young thoracic surgeons through collaborative studies. He is also one of very few thoracic surgeons who have his own research laboratories. He is administering a variety of studies in different fields of basic research, in addition to his significant clinical achievements and provides research opportunities for young thoracic surgeons, regardless of their institution.

He is founder of Asia Thoracoscopic Surgery Education Program (ATEP) which is known as a representative education program of thoracoscopic surgery in Asia. He also organized the Korean Thoracoscopic Surgery Study Group and published the ‘Video Atlas of Thoracoscopic Surgery’. He is also one of 4 founding members of the Asia Thoracic Surgical Club (ATSC) which was established in 2001.

Not only does he publish many scientific papers in major journals, he is invited to lecture around the world. He designed the Global Medical Academy in SNUBH and has been inviting a series of board-certified doctors (numbering over 250) from the city of Moscow for 2-week education courses. By this initiative the SNUBH Global Medical Academy has begun to expand its capacity to other countries.