

# Uniportal video assisted thoracic surgery: summary of experience, mini-review and perspectives

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**Abstract:** The uniportal-video assisted thoracic surgery (VATS) technique comprises operations which can be performed with skin incisions ranging from 2 to 8 cm and the manifest result of the introduction of the uniportal lobectomy had made possible to increase rapidly the number of published papers on this subject. Many of the large ensuing literature report incomplete historical information on uniportal VATS, and doubts exist about the indication of uniportal VATS for some thoracic oncologic pathologies. Known limitations have been overcome. On the other hand, the modern thoracic surgical team includes one surgeon, one assistant and a scrub nurse, and it is clear that the new generation of thoracic surgeons need to use the “less” used hand. The new technology which permitted the introduction of the uniportal VATS could influence the future need of thoracic surgeons worldwide.

**Keywords:** Video assisted thoracic surgery (VATS); uniportal VATS; single port

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The manifest result of the introduction of the uniportal lobectomy by Gonzalez *et al.* (1) had made possible in the last year to increase rapidly the number of published papers on this subject (2-11), and the term uniportal video assisted thoracic surgery (VATS) is becoming more and more known to thoracic surgeons (12). The “uniportal-VATS” technique comprises operations which can be performed with skin incisions ranging from 2 to 8 cm.

## Summary of surgical experience

Since October 1998 to June 30 2015 excluding November 1999 to June 2000, June 2004 to December 2006 and January 2009 to May 2010 (MM worked abroad) more than 300 patients have been operated using uniportal VATS technique in our thoracic unit. In this mini-review, we excluded all patients operated with 4, 6 or 8 cm incision, and therefore only operations performed through a “true” 2 cm incision have been included.

Two hundred fourteen patients have been operated.

There were 135 male and 79 female with a mean age of 64.3 (range, 19-96) years. General anesthesia has been used in 129 patients. The following procedures have been performed: pleural biopsy for diagnostic purposes (mesothelioma, pleural plaques, metastasis) in 130 patients, talc pleurodesis for malignant pleural diseases or pneumothorax in 95, thoracic debridement for II stage empyema and clotted hemothorax in 42, staging lung cancer in 25, wedge resections for interstitial lung diseases and peripheral lung nodule in 14, decortication for III stage empyema in 12, mediastinal biopsy in 8, partial pleurectomy for removal of benign pleural tumours and pneumothorax in 5, bilateral sympathectomies in 3 patients, postoperative mediastinal bleeding in 1 patient. Operative time was 71 (range, 20-195) min under general anesthesia and 37.3 (range, 10-90) min under local anesthesia. Overall hospital stay was 5.7 (range, 2-16) days, and it was 5.4 (range, 2-16) days for patients operated under general anesthesia and 6 (range, 2-14) days under local anesthesia. Postoperative complications occurred in 29 patients (14%). In 11 patients (5.1%) conversion was

necessary and precisely a mini-thoracotomy in four patients (1.87%) and more than 1 trocar in seven (3.27%). Hospital mortality was 0.47% (a patient with malignant pleural effusion).

### Comment and perspectives

It has been noted that the information on the initial history of the uniportal VATS are often not entirely accurate (13). The results of the first prospective trial reporting the method to perform several thoracic procedures via 2 cm uniportal VATS technique was initiated in 1998 and published in 2000, 2001 and 2003 (14-17). The conception to use a rigid 0 or 30° optic separated from two or three instruments such as suction/irrigator device, electrocautery, endoscopic grasper and scissors, endoscopic ligaclips, or open surgical instruments was applied to patients for more than a few thoracic pathologies. Few years later the uniportal VATS technique was popularized with several selective publications for empyema, pneumothorax, interstitial lung disease, pulmonary nodules and in trauma (8,18-21).

It is evident that the true acceleration of this technique has been made with the advent of new energy device which enables more precise energy delivery, improved thermal management and large vessel sealing up to and including 7 mm in diameter, and with the introduction of smaller instruments such as new endoscopic staplers. These technology devices permitted the outstanding introduction of SITS lobectomy by Gonzalez *et al.* in 2011 (1).

A recent review suggests that except for pain score the uniportal VATS reveals no differences in most postoperative outcomes in minor or major thoracic procedures (22). Other AA suggest that scientific evidence is necessary to demonstrate the efficacy of VATS lobectomy, and more convincing results from definitive randomized clinical trials comparing VATS versus open surgery are necessary before VATS is adopted in routine clinical practice (23,24). We believe that uniportal VATS represents a real advantage for our patients and will be more often used in the next years (25) until proved differently. Furthermore, in some circumstances, the hospital stay could be reduced to approximately 24 h (i.e., wedge resection or nodal biopsy) and therefore the 2 cm uniportal VATS can be straightforwardly included in any outpatient thoracic surgical programme (26).

The two most common limitations for the 2 cm uniportal VATS include the crowing of surgical instruments that collide with one another and the optic that gets dirty easily.

The crowding of surgical instruments is clearly due to the lost of the triangulation for strategic visibility of the target pathology, but experience says that using this technique surgeon must be able to work freely inside the chest, and to move accordingly to the intraoperative necessity using judiciously both hands. Therefore it is necessary that the new generations of thoracic surgeons train to use the “less” used hand.

Needless to say that most thoracic operations, including sleeve resection and non intubated patients, are now performed through a 2, 3, 6 or 8 cm single skin incision, and consequently the modern thoracic surgical team includes merely one surgeon who operates together with the first assistant who holds the camera (he/she can be a resident or a staff nurse) and a scrub nurse.

For the above reason, the future agenda for thoracic surgery must include at every social level (politics, economy and scientific societies) a deep thought about the possibility that the new technology which permitted the introduction of the uniportal technique, and is giving support for future development of our specialty could influence the future need of thoracic surgeons worldwide.

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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