

Uniportal Therapeutic Video-Assisted Thoracoscopic Surgery: A Single Hospital Experience, Taif Saudi Arabia

Majed Al Mourgi¹, Ahmad Haj Hussein², Tamer Abdel-Rahman^{1,3}, Samir Badr^{1,4},
Reem Alsayali⁵, Samah Al-Sawat⁵, Rana Alsayali⁵

¹Department of Surgery, Taif University, Saudi Arabia, ² King Abdul-Aziz Specialist Hospital Taif Saudi Arabia, ³Banha Teaching Hospital, Banha, Egypt, ⁴GOTHI, Egypt, ⁵College of Medicine, Taif, University
Corresponding author: Dr. Majed Al Mourgi, FRCS, FCCP, FACS, Email: mourgi@hotmail.com

ABSTRACT

Background and aim of the work: Therapeutic uniportal video-assisted thoracic surgery (VATS) has less postoperative pain, shorter hospital stay, and less operative time. In this study we will present our experience in therapeutic VATS at King Abdul Aziz Specialist Hospital, Taif Saudi Arabia.

Patients and methods: This retrospective study was conducted in King Abdul Aziz Specialist Hospital, Taif, Saudi Arabia, from July 2012 to January 2016 and included 162 patients who were admitted to the hospital in this period and therapeutic uniportal VATS was conducted for them.

Results: The 162 patients were 102 males (63%) and 60 females with mean age of 45.1±6.8 years. Bilateral sympathectomy was performed for palmar hyperhidrosis in 36% of cases, VATS stapled blebectomy with apical pleurectomy were performed for primary spontaneous pneumothorax in 32% of cases, wedge resections in 23.5%, adhesiolysis was performed in 5%, and in 3.7% anatomical segment resections was done. Mean operative time was 25.5±5.5 minutes. The mean hospital stay was 5.3±1.2 days. No operative or early postoperative mortality was recorded.

Conclusion: Uniportal VATS was proved to be safe and effective and can replace the multiportal approach in the management of various disorders which require thoracic surgery.

Keywords: Video-assisted thoracic surgery (VATS), uniportal VATS, uniportal sympathectomy, uniportal blebectomy, uniportal pleurodesis, Taif, Saudi Arabia

INTRODUCTION

Over the past two decades, video-assisted thoracic surgery (VATS) has revolutionized the management of intrathoracic disorders. (1-3) VATS is associated with less pain, decreased general complications and shorter hospital stay which in turn decreases the hospital cost. (4) The technique has the same principles of tumor management if compared with traditional open procedures. (5-7) VATS leads to a fast postoperative recovery which allows the earlier administration of adjuvant therapy when necessary. (7) The implementation of uniportal technique into the clinical practice is spreading globally and the initial clinical outcomes and short-term results are encouraging, and more long term data are awaited. (1-7) In this study we will present our experience in therapeutic VATS at King Abdul Aziz Specialist Hospital, Taif Saudi Arabia.

PATIENTS AND METHODS

In this retrospective study which involved 162 patients, we revised the records of all patient who were admitted to King Abdul Aziz

Specialist Hospital, Taif, Saudi Arabia, from July 2012 to January 2016 and therapeutic uniportal VATS was conducted for them. After approval of ethical board of the hospital and taking informed consents we revised the patients records. Records which could not be properly evaluated were excluded from the study. Outcomes were; the surgical indications, operative findings, mean operative duration, rate of conversion to open procedure, postoperative pain, and mean hospital stay. **Statistical analysis** was done using SPSS program version 18.0. Qualitative data were expressed as number, percentage and mean ± standard deviation. Mc Nemar test was used to compare paired categorical data.

RESULTS

The 162 patients were 102 males (63%) and 60 females with mean age of 45.1±6.8 years. The cases included 58 (36%) where sympathectomy was performed for palmar hyperhidrosis, 52 cases (32%), where VATS stapled blebectomy with apical pleurectomy were performed for primary spontaneous pneumothorax, wedge

resections was performed in 38 cases (23.5%), in 8 cases adhesiolysis was performed (5%), and in 6 cases (3.7%) anatomical segment resections was done. Mean operative time was 25.5 ± 5.5 minutes. The mean hospital stay was 5.3 ± 1.2 days. No operative or early postoperative mortality was recorded. Results are summarized in Table 1.

DISCUSSION

In our hospital the 3-port VATS was the standard procedure for minor procedures whereas the postero-lateral thoracotomy was the standard approach for major resections. However, we started the uniportal technique at the end of 2011 and the patient selection was limited to low risk individuals, which reflected our relatively short postoperative hospital stay compared with that recorded in literature.⁽¹⁻⁴⁾ Most of the authors explained shorter hospital stay in uniportal VATS compared with multiportal approach by less operative trauma, less liability to wound site complications, and less post-operative pain.⁽³⁻⁸⁾ Most of the studies verified that patients in the uniportal group had reduced in-hospital stay ($P = 0.03$), and this led to a reduction in inpatient costs ($P = 0.03$).⁽⁷⁾ Few studies, however, did not find any significant difference in duration of hospital stay.⁽⁶⁾

The unavailability of the special instruments for the technique with proximal and distal articulation was a limiting factor, which was reported by other authors.⁽⁵⁻⁷⁾ With the progress in the learning curve and the availability of the these instruments, our mean operative time had been improved. The uniportal VATS instruments are available with slight curvature and narrower shaft to allow the use of a small incision.^(1,7) Chen *et al.*⁽⁷⁾ recorded in their study, that pain in uniport group is significantly lower than that recorded in the multiport group in the first 36 hours postoperatively and they reported also in the uniport group, 20% of patients had residual pain in the following 3 weeks, versus 32% in the two-port group (P -value > 0.05). Similar results of early post-operative pain were reported in our study. Ibrahim *et al.*⁽¹⁰⁾ in their study found that postoperative pain after single port sympathectomy lasting less than 1 week was recorded in 12% of cases and only 2% of all

patients required narcotic analgesics and they found that relevant constant residual pain after 7 days following operation was not significant. De Campos *et al.*⁽¹¹⁾ verified that pain is mostly related to trauma of the thoracic wall and periosteal lesions caused while introducing the trocars into the intercostal space, explaining the higher incidence of pain in biportal than in uniportal procedures. However, Yang *et al.*⁽⁹⁾ found that uniportal VATS may have a small clinical effect in reducing postoperative pain and they concluded that further studies are needed before single-port can be recommended as less painful than multiport thoracoscopic surgery. Similar conclusion was obtained by Mier *et al.*⁽⁸⁾

Our study represents an early Saudi Arabian experience with uniportal VATS in a heterogeneous group of patients and proved the feasibility of the procedure with low conversion rate and morbidity.

CONCLUSION: Uniportal VATS was proved to be safe and effective and can replace the multiportal approach in the management of various disorders which require thoracic surgery.

Conflict of interest: none declared.

REFERENCES

1. Dunning J, Prendgast B, Mackway-Jones K (2003). Towards evidence based medicine in cardiothoracic surgery: best BETS. *Interact CardioVascThoracSurg.*,2:405–9.
2. Li C, Ma H, He J, Ni B, Xu C, Zhao J (2013). Clinical analysis of thoracoscopic lobectomy in the treatment of peripheral lung cancer with single utility port. *Chin J Lung Cancer*,16:487–91.
3. McElnay PJ, Molyneux M, Krishnadas R, Batchelor TJ, West D, Casali G (2015). Pain and recovery are comparable after either uniportal or multiport video-assisted thoracoscopic lobectomy: an observation study. *Eur J Cardiothorac Surg.*, 47(5):912-5.
4. Tamura M, Shimizu Y, Hashizume Y (2013). Pain following thoracoscopic surgery: retrospective analysis between single-incision and three-port video-assisted thoracoscopic surgery. *J Cardiothorac Surg.*,12:153.
5. Salati M, Brunelli A, Xiumè F, Refai M, Sciarra V, Soccetti A, et al (2008). Uniportal video-assisted thoracic surgery for primary spontaneous pneumothorax: clinical and economic analysis in comparison to the traditional approach. *InteractCardioVascThorac Surg.*, 7:63–6.

6. **Jutley RS, Khalil MW, Rocco G (2005).**Uniportal vs. standard three-port VATS technique for spontaneous pneumothorax: comparison of post-operative pain and residual paraesthesia. *Eur J Cardiothorac Surg.*, 28:43–6.
7. **Chen YB, Ye W, Yang WT, Shi L, Guo XF, Xu ZH, et al (2009).**Uniportal versus biportal video assisted thoracoscopic sympathectomy for palmar hyperhidrosis. *Chin Med J.*, 122:1525–8.
8. **Mier JM, Chavarin A, Izquierdo-vidal C, Fibla JJ, Molins L (2013).**A prospective study comparing three-port video-assisted thoracoscopy with the single-incision laparoscopic surgery (SILS) port and instruments for the video thoracoscopic approach: a pilot study. *Surg Endosc.*, 27:2557–60.
9. **Yang HC, Cho S, Jheon S (2013).**Single-incision thoracoscopic surgery for primary spontaneous pneumothorax using the SILS port compared with conventional three-port surgery. *SurgEndosc.*, 27:139–45.
10. **Ibrahim M, Menna C, Andreetti C et al. (2013):** Two-stage unilateral versus one-stage bilateral single-port sympathectomy for palmar and axillary hyperhidrosis. *Interactive Cardiovascular and Thoracic Surgery*, 16:834–8.
11. **De Campos JR, Kauffman P, Werebe Ede C et al (2003):** Quality of life, before and after thoracic sympathectomy: report on 378 operated patients. *Annals of Thoracic Surgery*,76:886–91.

Table 1: Patients' criteria and outcome of uniportal therapeutic VATS

Number of patients	162
Sex: Male Female	102 (63%) 60 (37%)
Mean age (years)	45.1±6.8 years
Mean operating time	25.5±5.5 minutes
Operations performed Bilateral sympathectomy Stapled blebectomy with apical pleurectomy Wedge resections in 8 cases Adhesiolysis Anatomical segment resections	58 (36%) 52 (32%) 38 (23.4) 8 (5%) 6 (3.6%)
Mean postoperative hospital stay (hours)	5.3±1.2
Conversion to open procedure	5 (13.1%)
Neuralgia/paresthesia: Early (for 7-10 days) Residual (for one month)	24 (14.8%) 8 (5%)
Number of deaths	0 (0%)