

## Less number of ports means less invasiveness – a Siren’s song?

Wentao Fang

Department of Thoracic Surgery, Shanghai Chest Hospital, Shanghai 200030, China

*Correspondence to:* Wentao Fang. Department of Thoracic Surgery, Shanghai Chest Hospital, Shanghai 200030, China. Email: vwtfang12@shchest.org.

*Provenance:* This is an Invited Article commissioned by Guest Editor Hyun Koo Kim, MD, PhD (Departments of Thoracic and Cardiovascular Surgery, Korea University Guro Hospital, Korea University College of Medicine, 97 Guro-donggil, Guro-gu, Seoul 152-703, Korea).

*Comment on:* Han KN, Kim HK, Lee HJ, et al. A 2-cm single-incision thoroscopic left upper division segmentectomy. *J Vis Surg* 2015;1:11.

Received: 13 March 2016; Accepted: 14 March 2016; Published: 24 March 2016.

doi: 10.21037/jovs.2016.03.15

**View this article at:** <http://dx.doi.org/10.21037/jovs.2016.03.15>

Single port video-assisted thoracic surgery (VATS) has become a hot issue in recent years. Although no strong evidence has been gained to support its superiority comparing to conventional multi-port VATS, many talented surgeons have proved its safety and oncological efficacy in various thoracic procedures including lung cancer surgery (1-7). The video presented in this issue of *JOVS* by Dr. Han and his colleagues (8) is another good example. Using a 2-cm single incision, the authors successfully completed a left upper lingual-sparing segmentectomy for a 1.7-cm ground glass nodule, which turned out to be an early stage adenocarcinoma with acinar and lepidic subtypes.

Intuitively fewer ports and smaller incisions may help decrease surgical trauma, diminish incisional pain, and thus facilitate postoperative recovery. Cosmetic benefit would be another concern, especially in younger female patients. After reporting the first serious of single port VATS for wedge resections (1), Jutley *et al.* (2) reported that post-operative pain and paranesthesia incidence was lower after single port than three-port VATS bullectomy for spontaneous pneumothorax. Apart from that, no other study has ever been reported showing the superiority of single port VATS. A propensity score matched study by Shen *et al.* (9) concluded that in comparison with conventional VATS, single-port VATS showed better safety and efficacy in lobectomy for lung cancers. However looking carefully at their results, blood loss during operation, morbidity or mortality rates, and length of postoperative hospital stay were actually similar between the two groups. Although they did show a shorter time for completion of lobectomy in the single port group, prolonged time for lymph node dissection in this group made the total operation time similar for single or multiple port VATS. Thus, future

studies focusing on functional advantages of single port VATS are mandatory so as to prove its value.

Single port VATS was first used in simple thoracic procedures such as wedge resection (1), bullectomy (2), or lymph node staging (3). Later on, its indication gradually increased to cover other routine thoracic surgeries including lobectomy (4). Nowadays, extensive procedures such as pneumonectomy (5) or complicated cases necessitating double sleeve lobectomy (6) have also been shown to be feasible under single port VATS in experienced hands. Gonzalez-Rivas reported the first anatomical segmentectomy using single port VATS in 2012 (7). By reducing the port size to a mere 2 cm, the current video by Dr. Han *et al.* (8) is an exemplary presentation of the further improvement in VATS techniques. Without doubt single port approach is technically more demanding than conventional multiple port VATS. In fact the biggest charm of single port VATS seems to lie in the demonstration of the surgeons’ capability of fulfilling complicated maneuvers in a limited space. Few studies have ever compared the outcomes of single or multiple port VATS systemically. Apart from functional results or pain control, oncological outcomes would be another major concern. No long-term results have ever been presented concerning prognosis of lung cancer patients after single port VATS. For radicality of lung cancer surgery alone, Liu *et al.* (10) reported that lymph nodes harvested via single port approach could be even more than in multiple port VATS. Although it was only a time series representing a transitional experience and their learning curve, it at least showed that similar extent of lymph node dissection could be retrieved during single port VATS for lung cancers. In the meantime, Shen’s study clearly showed that in single port VATS, the difficulty

in lymphadenectomy was even greater than resection of the lung itself. This was reflected by a reduced time for lobectomy but prolonged time for lymph node dissection (9).

In short, currently available evidences for single port VATS are mostly empirical. The use of fewer ports for VATS anatomical lung resections may reduce early postoperative pain, but does not substantively reduce recovery times or morbidity. At the same time, it would not compromise patient safety or radicality of resection as long as surgical oncological principles are observed. Dr. Han and his colleagues should be complimented for their outstanding expertise in single port VATS. But while we are sweating with the effort to push the technical limits in VATS surgery by using less ports, it should also be kept in mind that intensive research is still in need to display the real benefit of this approach for our patients.

### Acknowledgements

None.

### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

### References

1. Rocco G, Martin-Ucar A, Passera E. Uniportal VATS wedge pulmonary resections. *Ann Thorac Surg* 2004;77:726-8.
2. Jutley RS, Khalil MW, Rocco G. Uniportal vs standard three-port VATS technique for spontaneous pneumothorax: comparison of post-operative pain and residual paraesthesia. *Eur J Cardiothorac Surg* 2005;28:43-6.
3. Rocco G, Brunelli A, Jutley R, et al. Uniportal VATS for mediastinal nodal diagnosis and staging. *Interact Cardiovasc Thorac Surg* 2006;5:430-2.
4. Gonzalez D, Paradela M, Garcia J, et al. Single-port video-assisted thoracoscopic lobectomy. *Interact Cardiovasc Thorac Surg* 2011;12:514-5.
5. Gonzalez-Rivas D, Delgado M, Fieira E, et al. Double sleeve uniportal video-assisted thoracoscopic lobectomy for non-small cell lung cancer. *Ann Cardiothorac Surg* 2014;3:E2.
6. Gonzalez-Rivas D, de la Torre M, Fernandez R, et al. Video: Single-incision video-assisted thoracoscopic right pneumonectomy. *Surg Endosc* 2012;26:2078-9.
7. Gonzalez-Rivas D, Fieira E, Mendez L, et al. Single-port video-assisted thoracoscopic anatomic segmentectomy and right upper lobectomy. *Eur J Cardiothorac Surg* 2012;42:e169-71.
8. Han KN, Kim HK, Lee HJ, et al. A 2-cm single-incision thoracoscopic left upper division segmentectomy. *J Vis Surg* 2015;1:11.
9. Shen Y, Wang H, Feng M, et al. Single- versus multiple-port thoracoscopic lobectomy for lung cancer: a propensity-matched study†. *Eur J Cardiothorac Surg* 2016;49 Suppl 1:i48-i53.
10. Liu CC, Shih CS, Pennarun N, et al. Transition from a multiport technique to a single-port technique for lung cancer surgery: is lymph node dissection inferior using the single-port technique?†. *Eur J Cardiothorac Surg* 2016;49 Suppl 1:i64-i72.

doi: 10.21037/jovs.2016.03.15

**Cite this article as:** Fang W. Less number of ports means less invasiveness—a Siren's song? *J Vis Surg* 2016;2:66.