



Bleeding control during VATS major lung resection without conversion: safe and feasible?

Fabrizio Minervini¹, Peter Bruno Kestenholz¹, Luca Bertolaccini², Benedetta Bedetti³, Davide Patrini⁴, Enrico Cassina⁵, Marco Scarci⁵

¹Department of Thoracic Surgery, Kantonsspital Luzern, Lucerne, Switzerland; ²Department of Thoracic Surgery, Maggiore Hospital, Bologna, Italy; ³Department of Thoracic Surgery, Malteser Hospital, Bonn, Germany; ⁴Department of Thoracic Surgery, University College London Hospitals, London, UK; ⁵Department of Thoracic Surgery, San Gerardo Hospital, Monza, Italy

Correspondence to: Fabrizio Minervini. Department of Thoracic Surgery, Kantonsspital Luzern, Lucerne, Switzerland.

Email: fabriziominervini@hotmail.com.

Comment on: Guo C, Mei J, Ma L, *et al.* Handling vascular bleeding without conversion during video-assisted thoracoscopic surgery major pulmonary resection. *Ann Transl Med* 2018;6:363.

Submitted Nov 09, 2018. Accepted for publication Nov 13, 2018.

doi: 10.21037/atm.2018.11.38

View this article at: <http://dx.doi.org/10.21037/atm.2018.11.38>

Video-assisted thoracic surgery (VATS) represents nowadays the standard for the treatment of the majority of benign and malignant lung diseases. Even if the learning curve brings *per se* an increase in the number of post-operative complications, more and more surgeons have gained experience and can perform also complex cases thoracoscopically getting good outcomes without increasing morbidity and mortality. Nevertheless, the only surgeon without intraoperative complications is the one who performs no surgery.

Any surgeon's worst nightmare is the intraoperative bleeding caused by vascular injury and the solution is often a challenge because the most common surgeon reflex is to panic, stop breathing and perform a thoracotomy.

Actually there are several strategies, other than conversion, in order to manage an intraoperative bleeding caused by vascular injury and some publications describe them in detail (1-3).

We read with great interest the study of Guo and colleagues published in September 2018 in the *Annals of Translational Medicine*. The authors described three videos presenting their suction-compressing angiorrhaphy technique (SCAT) to manage bleeding caused by vascular injuries during VATS anatomical pulmonary resection.

This technique was first described in 2013 in a retrospective study including 414 patients who underwent VATS pulmonary resection with 17 patients who experienced bleeding complication due to unexpected

vascular injury. On these 17 patients (4.11%), 2 conversion to thoracotomy were performed and 15 (15/17, 88.24%) were successfully managed using the SCAT procedure without emergency conversion (4).

The first step of the SCAT procedure is to use the tip of the suction to provide compression, stop the bleeding and clean the surgical fields from blood clots in case of vascular injury. The next phase is to perform the vascular suture in a manner based on the size of the injury.

For lesions <5 mm the repair could be done with direct suturing using 5-0 Prolene stitches with an endoscopic needle-holder. Sometimes it could be useful to dissect the surrounding structures in order to expose better the margins of the wound. If the injury is larger than 5 mm but limited to one-third of the circumference of the injured vessel, the authors suggests to replace the suction with an Allis forceps, suture with 5-0 Prolene stitches and tie after clamp removal. In case of wounds exceeding one third of the vascular circumference they suggest the mobilization and clamp of the main pulmonary artery (PA) with a Bulldog clamp.

In our experience we use as first line treatment the compression with a sponge stick, mounted on a long thoracoscopic forceps, cleaning, at the same time, with the suction the surgical fields in case of repair afterwards. If the vascular injury is not manageable with compression or direct suturing and involves the PA we usually try to get proximal control mobilizing and clamping the main PA while with a sponge stick we are compressing the

injury. We usually don't use forceps on the injured PA to avoid enlargement of the wound due to the frailty of the vascular wall.

This paper provides a valuable contribution to a very important topic such as the intraoperative bleeding during VATS major resection. It's of course prerogative of the surgeon to be sure that is offering the best and safest surgery to his patients always keeping in mind the Hippocratic "primum non nocere". A crucial point is to know, according with the surgeon's skills and experience, at which moment a conversion to thoracotomy must be performed never considering it a failure.

Acknowledgements

None.

Footnote

Conflicts of interest: The authors have no conflicts of interest

Cite this article as: Minervini F, Kestenholz PB, Bertolaccini L, Bedetti B, Patrini D, Cassina E, Scarci M. Bleeding control during VATS major lung resection without conversion: safe and feasible? *Ann Transl Med* 2019;7(1):20. doi: 10.21037/atm.2018.11.38

to declare.

References

1. Gonzalez-Rivas D, Stupnik T, Fernandez R, et al. Intraoperative bleeding control by uniportal video-assisted thoracoscopic surgery. *Eur J Cardiothorac Surg* 2016;49 Suppl 1:i17-24.
2. Wu CF, de la Mercedes T, Fernandez R, et al. Management of intra-operative major bleeding during single-port video-assisted thoracoscopic anatomic resection: two-center experience. *Surg Endosc* 2018. [Epub ahead of print].
3. Guo C, Mei J, Ma L, et al. Handling vascular bleeding without conversion during video-assisted thoracoscopic surgery major pulmonary resection. *Ann Transl Med* 2018;6:363.
4. Mei J, Pu Q, Liao H, et al. A novel method for troubleshooting vascular injury during anatomic thoracoscopic pulmonary resection without conversion to thoracotomy. *Surg Endosc* 2013;27:530-7.