



# Do we need any further evidence about minimally invasive thoracic surgery?

Marco Scarci<sup>1</sup>, Gaetano Rocco<sup>2</sup>

<sup>1</sup>Department of Thoracic Surgery, University College London Hospital, London, UK; <sup>2</sup>Division of Thoracic Surgery, Department of Thoracic Surgical and Medical Oncology, Istituto Nazionale Tumori Fondazione G. Pascale, Naples, Italy

*Correspondence to:* Marco Scarci. Department of Thoracic Surgery, University College London Hospital, 16-18 Westmoreland Street, London, UK. Email: marco.scarci@mac.com.

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In the last decade the development of thoracoscopic approach for early stage lung cancer resections has seen a significant increase, mostly because of the improvement in technology. Some organizations (1) even recommend it in their guidelines. Yet in striking contrast with modern evidence-based practice, such enthusiasm is only underpinned by mostly small, retrospective trials comparing video-assisted thoracoscopic surgery (VATS) to open thoracotomy. By contrast, Bendixen (2) and colleagues' randomised controlled trial offers an objective assessment in terms of postoperative pain and quality of life (QoL), further consolidating previous evidence. Previous papers compared different type of VATS with different open approaches, thus affecting the quality of the results. Interestingly Bendixen and colleagues compare VATS with anterior thoracotomy, which is considered to be the least invasive open approach. Whilst, intuitively, sparing the latissimus dorsi is likely to be better than posterolateral thoracotomy, demonstrating the advantage of VATS over anterior thoracotomy is a further positive point in this study.

Most techniques in surgery follow a typical distribution curve: there is resistance at first, then it reaches a tipping point after which adoption grows exponentially. Doing a trial after the tipping point might seem unethical and unfeasible. That is why we read with interest the paper of Bendixen and colleagues as the first randomized control trial comparing the outcomes of VATS *vs.* open surgery. From the growing body of non-randomised studies, VATS is generally assumed to be less traumatic than thoracotomy,

with reduced postoperative pain, perioperative bleeding, length of hospital stay, and faster return to normal activities. Bendixen and colleagues results support this assumption in terms of postoperative pain and QoL.

There are few issues, though, with this trial that we would like to be addressed in any future trial such as the VIOLET by Eric Lim. The first thing to note in this well-executed study is the choice of endpoints: postoperative pain and overall QoL. Although these are important things to consider after surgery we have some reservation about the choice. Pain has two components: inflammatory, related to the actual incision and neuropathic related to the compression of the intercostal nerve by the spreader, in open surgery, or the trocar in VATS surgery. The authors prefer to use the four ports approach. One might wonder whether the pain would be even less with the uniportal approach (3) which avoids the use of trocars altogether and limits the incision to one intercostal space rather than several. Somehow it is disappointing to have chosen a four ports approach as this one is slowly disappearing in favor of a one to three approach. It would be interesting to know whether the number of ports affect the outcome.

Pain is also a notoriously difficult endpoint to measure due to the interpatient variability and the different analgesic regime. Furthermore, in the trial the test for the QoL is a global measure, we wonder whether a more specific lung cancer focused QoL score would be more discriminatory and allow clearer results. Concept like lung cancer expected survival and postoperative dyspnea are important for this

group of patients.

The further point we would like to make is that VATS is an approach not a new operation. As such we should be evaluating the oncological results and the overall survival, at least in terms of non-inferiority. Unfortunately, though such outcomes were not primary endpoints in the Bendixen trial and it was not adequately powered for such investigations.

However, the real question remaining is can a minimally invasive approach be at least as effective as standard thoracotomy in terms of oncological results, safety and long-term outcomes? So far, no clear evidence on this point has been provided. Hopefully the VIOLET trial (4) will shed some light on this important question and we look forward to reading the conclusions.

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