Commentary

The long-waited high level evidence in thoracic surgery

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Bendixen and colleagues conducted this well-constructed randomized trial in patients who underwent curative surgery for stage I non-small cell lung cancer, comparing the postoperative pain and quality of life (QoL) after anterolateral thoracotomy to video-assisted thoracoscopic surgery (VATS) (1). Being one of the most lethal cancer, the incidence of lung cancer is increasing around the world (2). With the advent of low dose chest computed tomography (CT) scan, more and more indeterminate lung nodules and early stage lung cancers have been diagnosed, and many of them would eventually receive surgical resections (3), inasmuch as this trend, a proper suggestion on type of operation becomes paramount. Although it is reasonable to assume that VATS is superior to thoracotomy in terms of postoperative wound pain based on the literature, most of these evidences are non-randomized comparative studies (4,5). Before this study, the debates between these two procedures have never been settled. Revealed by this trial, superior outcome in both postoperative pain and QoL are seen in VATS group. However, a further investigation comparing VATS to "posterolateral thoracotomy" or comparison between VATS with different number of port is still needed.

In 2010, VATS was an "acceptable alternative" to thoracotomy in the treatment of non-small cell lung cancer according to the National Comprehensive Cancer Network (NCCN) guideline; and it becomes the "preferred procedure" since the 2014 version (6). If the advantage of VATS is such clear, we may ask: is it unethical to conduct such a trial? It has been a long time that VATS as the first line therapy for most thoracic disease, including lung cancer in many surgical units. Pioneers in minimally invasive thoracic surgery even apply VATS in complex procedures with advanced techniques, such as uniportal VATS, which many surgeons in Asia are enthusiastic about (7,8). The thoracic surgeons in Taiwan have published a series of reports of uniport VATS, including feasibility results, multi-institutional study, as well as lymph node retrieval and pain comparison studies (9-11). Tu *et al*. reviewed the current development of uniportal VATS and concluded that less perioperative pain or less amount of painkillers used were demonstrated in most comparative studies (12). So, does the trial come too late? In non-randomized trials, biases could not be eliminated completely. The choice of VATS may be biased for reasons such as centrally-located tumors, pleural adhesions, or inexperience of the surgeon. These factors will ultimately affect decision making, but are not frequently disclosed in most non-randomized retrospective studies. And because of the nature of surgical treatments, it is also hard to achieve "blinded randomization".

A pearl in this trial is the detailed picture of the postoperative pain and QoL. Before this study, a prospective controlled trial from China by Long *et al*. described the postoperative QoL and pain scores up to six months postoperatively (13). Bendixen *et al*. extended the observations up to 1 year, and we could see that the pain scale was significantly higher in the thoracotomy group than the VATS group, especially in the day 1, day 2 and 2 weeks after the surgery. As for the QoL, the nadir of postoperative QoL was both on the second week. Then the QoL gradually improved with time in both group, while in most of the time, QoL in the VATS group was better than in thoracotomy group. These are invaluable information showing differences between VATS and thoracotomy.

The reason not to perform VATS as the primary approach for early stage lung cancer could be summarized

into two major categories: unwilling to, or unable to. Begum *et al*. described some possible reasons preventing surgeons from performing VATS, which include but not limit to, overall experience in VATS surgery in the centers, cost implications, initial capital investment in instrumentation, cultural approach and trust to VATS surgery, operative theater capacity and cancer target breaches and perceived complexity of the procedure (14). With the support of current evidences, doubts in the safety and feasibility of VATS in experienced centers are ungrounded. With the addition of this current trial, thoracic surgeons should have more faith in VATS. As for the technical factors which prevent surgeons from adopting VATS, many workshops and short courses are helpful in building up the concepts, and in shortening the learning curve. In previous studies, an estimate of 30–60 lobectomies or segmentectomies is required for maturing VATS skills (15,16). Before a unit can provide VATS as a stable operative option, open thoracotomy would remain as a trustworthy and safe choice. However, the differences in postoperative outcomes should be made clear to the patients.

In conclusion, Bendixen and colleagues provide invaluable evidence about the value of VATS. They reported a complete picture sketching the changes in postoperative pain and QoL up to one year after thoracic surgery from a randomized control trial for the first time in the English literature. Even in the era of minimally invasive surgery, a late ratification of VATS is better than never. The benefits of VATS are made clear and solidified further. What would be the next? Trials comparing uniport VATS with multi-port VATS!

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Footnote

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