Editorial Commentary

Potential advantage of digital drainage systems using a low-suction approach after video-assisted thoracoscopic surgery lobectomy

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Holbek *et al.* recently reported the results of a randomized controlled trial comparing their standard suction to low suction approach after video-assisted thoracoscopic surgery (VATS) lobectomy (1). The investigators used the Thopaz digital drainage device. In their study, low suction was defined as 2 cm and the control arm had suction set at 10 cm. Their primary outcome was drainage duration (measured from the time of drainage insertion until drain removal. Secondary outcomes included time until drain removal criteria (air-leak <20 mL/min for 12 hours) were met, number of patients with prolonged air-leak (PAL) defined as an air-leak for >5 days, number of patients with respiratory complications and length of stay. All patients were treated with a standardized 3-port VATS approach, and were treated with their enhanced recovery after surgery (ERAS) protocol which included ambulation on the day of surgery. Interestingly the investigators do not routinely perform chest-X-rays after surgery, until 2 hours after drain removal which is different from most surgeons practice. Prior to their study, the institutional median duration of chest tube drainage was 2 days. The authors defined a clinically relevant reduction of 18 hours in median duration of drainage, and calculated a sample size of 230 patients that would be needed to achieve this.

After screening 447 patients, 230 were ultimately randomized, 8 were excluded for a variety of reasons, leaving 222 patients eligible for analysis. The primary outcome (median drainage duration) was significantly less in the intervention group at 27.4 versus 44 hours (P=0.047). The median total fluid production (566 versus 795 mL) and median time to air-leak cessation (5.2 versus 23.7 hours) were significantly different and favored the intervention group. There were trends favoring reduced incidence of PAL (14.4% versus 24.3%) and length of stay (2 versus 3 days) in the intervention group. There were no differences in the proportion or size of pneumothorax, need for additional drain insertion, and post-operative morbidity.

The investigators are to be congratulated for completing a nicely designed randomized trial. Additionally, the use of a standardized approach for lobectomy and ERAS protocol helps to strengthen the findings of their study. However, how does this help the practicing surgeon? Currently the adoption of electronic drainage systems is low among thoracic surgeons. In part this is related to cost, but also to a lack of benefit compared to traditional drainage as reported in a previous randomized study (2). Although drainage duration and fluid production were less in the intervention group, this may not translate into differences in outcome, depending on the drainage threshold that a surgeon feels comfortable with. A recent practice guideline made a 2b recommendation that chest-tubes could be removed with up to 450 mL output in a 24-hour period (3). Many surgeons would not feel comfortable with chest-tube removal with this output. On the other hand, the current study supports

the idea that higher suction, leads to larger pleural fluid output, and confirms the safety of a low-suction strategy from the outset with a digital system. However, could the same outcomes be achieved with a water-seal approach using a traditional drainage system, using an ERAS protocol after lobectomy? This question will need to be answered in future clinical trials.

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Footnote

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

Ethical Statement: The author is accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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