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INVITED COMMENTARY

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Challenging conventional dogma in chest drain placement following lung resection surgery: is there a best position?

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There's a way to do it better. Find it
Thomas Edison (1847–1931), Inventor

Recently, the 2 second authors, who are junior trainees, while assisting in an anatomical segmentectomy of the lingula, asked the first author why we placed the chest drain apico-posteriorly, which is our standard practice. Wanting to answer the trainees with the most accurate and scientific evidence the author, thought about the available literature and research on the subject as well as the answer he got himself when, as a trainee asked a similar question. He concluded that he did it that way because his own trainer and mentor, who happens to be the last author, did it so and thus suspected this is possibly a common theme among surgeons. Ultimately, it seems even though we surgeons want to consider ourselves as innovators and pioneers often times we are creatures of habit and convention! Therefore, he did the most logical and potentially educational thing he could think; he told them to look up the literature and then they would all have a discussion about it.

Surprisingly, there seems to be quite a paucity of evidence and published work regarding the best placement of a drain following a lung cancer resection via video-assisted thoracic surgery (VATS). This is because VATS procedures offer new and unique challenges to the surgeon. Often to minimize pain a singular chest drain is used, as opposed to the conventional one apical and one basal, which begs the question of how it should be placed within the hemithorax to optimize drainage. One school of thought ascribes to an anterior placement to facilitate the drainage of air and lung re-expansion while the patient is in the supine position, while others advocate posterior placement to ensure fluid drainage while in a similar position.

In this issue of the *Interactive CardioVascular and Thoracic Surgery* (*ICVTS*) journal author Pu *et al.* [1] present the singular work thus far assessing the optimal placement of the drain inside the chest following VATS lung resection for non-small cell lung cancer. Although we are all aware of the plethora of published work regarding the number of drains (1 or 2), the orientation (apical or basal) or the insertion position on the chest wall, there is no work specifically examining the optimal (anterior or posterior) position of a drain [2–4].

The authors have demonstrated a long interest on chest tube management with a number of publications on the subject [5, 6]. Consequently, it is not surprising they have now tackled this subject. Thus, in this retrospective, single-institution analysis spanning a 10-year period, of 4263 patients undergoing VATS resection for non-small cell lung cancer, the authors demonstrated that there is no difference in terms of clinical outcomes between anterior and posterior chest drain location. The primary outcome measured was unsurprisingly the duration of drainage, whereas secondary outcomes included drainage volume within the first 3 postoperative days, total drainage volume, length of postoperative stay and incidence of postoperative complications.

Despite the obvious limitations due to its nature mentioned above, this is a quite well-conducted analysis offering an answer to a query which may not appear innovative and thought-provoking but nevertheless is beneficial to have the evidence to support our daily surgical practice. The methodology and analysis are quite robust and therefore the outcomes reported are credible and pertinent. For example, it was quite pleasing to see that the authors have performed a sample size calculation prior to the commencement of their data mining and analysis which naturally enhances the validity of their findings. The inclusion and exclusion criteria are also well set and the outcomes measured clearly defined. In addition, the statistical analysis performed utilized sophisticated propensity score-matched modelling to balance baseline characteristics and minimize potential bias, as well as subgroup analysis according to the extent of resection, individual surgeon and uniportal versus 3-port VATS.

The authors therefore were able to unequivocally demonstrate that for lung cancer patients undergoing VATS resection, an anterior or a posterior chest tube placement was equivalent in terms of postoperative drainage, compilations and outcomes.

This result is not unexpected for experienced thoracic surgeons, as we are all aware of the old axiom 'put a good functioning drain in and the lung will do the rest'! A number of studies in the past have supported this notion, for example Riber *et al.* [7, 8] conducting a retrospective analysis of patients with spontaneous

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pneumothorax reported that the location of the chest drain (apical, middle or basal) did not influence postoperative drainage. Similarly, a meta-analysis performed by Zhou *et al.* [3] demonstrated that a single drain is equally effective to 2 drains in patients undergoing lobectomy in regards to postoperative complications and need for re-drainage.

Granted these are not groundbreaking findings but as mentioned previously, it is useful knowledge for surgeons to have. Considering that science moves with small steps and not with leaps and bounds the authors should be congratulated for their persistence, perseverance and hard work! Personally, individually reviewing over 4000 chest radiograms as they did seems quite challenging, but I am very glad it was done because I can now not only continue placing my drain apico-posteriorly but also can answer my trainees' question that although it is because of personal preference, there is evidence supporting this 'freedom of choice'!

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