



To resect, or not to resect: that is the question...

Caecilia Ng, Herbert Maier, Florian Augustin

Department of Visceral, Transplant and Thoracic Surgery, Center of Operative Medicine, Medical University of Innsbruck, Innsbruck, Austria

Correspondence to: Florian Augustin, MD. Department of Visceral, Transplant and Thoracic Surgery, Center of Operative Medicine, Medical University of Innsbruck, Anichstrasse 35, 6020 Innsbruck, Austria. Email: florian.augustin@i-med.ac.at.

Comment on: Dželilji A, Karuš K, Kierach A, *et al.* Efficacy and safety of pleurectomy and wedge resection versus simple pleurectomy in patients with primary spontaneous pneumothorax. *J Thorac Dis* 2019;11:5502-8.

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Treatment strategies for primary spontaneous pneumothorax (PSP) are varying. Thoracotomy, minimally invasive approach, wedge resection (even in patients without emphysema-like parenchymal changes), partial or complete parietal pleurectomy, pleural abrasion, talc pleurodesis, other chemical agents to induce pleurodesis, and many more techniques are accepted procedures. Moreover, all these techniques can be combined into a single preferred treatment strategy. Large randomized prospective studies are missing. Also, due to the variability in treatment, it is complex to compare retrospective studies on the treatment of PSP.

While guidelines suggest the resection of any visible changes of lung parenchyma, it is not clear how to treat patients without emphysema-like changes (1). A retrospective trial conducted by Czerny *et al.* in the late 1990's and early 2000's did show a significant reduction of PSP recurrence after apical lung wedge resection and apical pleurectomy in patients with stage I PSP (Vanderschueren classification) compared to apical pleurectomy alone (2). One might argue that the staple lines induce the formation of adhesions, thereby reducing the risk of recurrence. In this issue of the *Journal of Thoracic Disease*, Dželilji and colleagues report on the safety and efficacy of a pleurectomy-only treatment in patients without visible lung changes. This non-randomized observational study based on clinical analysis of 73 patients provides an overview of the treatment options and postoperative recurrence rates of PSP (3).

Vanderschueren's classification was used to determine the extent of morphologic alterations (4). Patients with stage I (no endoscopic abnormalities) and stage II (pleuropulmonary adhesions) disease were treated with video-assisted thoracoscopy surgery (VATS) pleurectomy from top to the

diaphragm, whereas patients with stage III (blebs/bullae less than 2 cm in diameter) and stage IV (bullae more than 2 cm diameter) received pleurectomy and additional lung wedge resection. Recurrences of PSP did only occur in the group of stage III and IV disease, but not in the group of patients without wedge resection. There were no differences in other perioperative parameters of efficacy and safety, like postoperative complications or drain duration. These results led the authors to the conclusion, that pleurectomy only in this very specific group of patients is comparable to pleurectomy and wedge resection in case of visible emphysema-like changes. It is important to note that the authors correctly derive the higher rate of PSP recurrence from the severity of PSP in patients with lung changes.

The present study raises some interesting questions: Both, the study by Dželilji and Czerny report patients suffering from persisting air leak in the pleurectomy-only group. All patients finally needed re-operation. Were these pleural ruptures just missed during the primary resection? Or is this in the end an argument for primary wedge resection despite a lack of parenchymal changes? It definitely highlights the problem of the significance of intraoperative Vanderschueren classification as decision guidance. If surgeons opt to omit wedge resection in normal appearing lung, they need to rule out any pleural damage, especially if the indication for surgery is persisting airleak. Underwater tests might help in these cases.

There are also conflicting reports about the method of choice for pleurodesis (5,6). If we omit parenchymal resection, could we also perform pleural abrasion to reduce the risk of postoperative hematoma as this is in some publication the preferred method of mechanical

pleurodesis? On the other hand, there are some reports that a pleurodesis does not alter the recurrence rate after lung wedge resection (7). If there is no need for lung resection (because there are no parenchymal changes) and no need for pleurodesis (as it does not change the course of the disease), do these patients need surgery at all?

There is at least one argument to advocate surgery: preoperative high-resolution computed tomography (CT) was not helpful to distinguish low-grade from high-grade Vanderschueren disease and 40% of patients with bulla have not been detected on previous CT scans in the study by Dželjilji *et al.* Moreover, a recent study by Park *et al.* demonstrated a 32.3% risk of PSP recurrence in patients without blebs or bullae in a high-resolution CT and no significant difference to patients with confirmed parenchymal changes ($P=0.429$) (8).

Is there an argument against parenchymal resection? A recently published study by Choi *et al.* demonstrated a higher risk of PSP recurrence in patients with a larger lung resection volume due to increased tension near the staple line (9). The authors hypothesized a bulla neogenesis in this area. This study gives at least evidence, that surgeons should resect only as little lung volume as necessary in PSP, which could be interpreted as none in patients with normal appearing lung tissue.

To conclude, the present study by Dželjilji *et al.* adds some evidence to the scarce literature of PSP treatment in patients without parenchymal changes. And yet, the contradictory results to other published series highlight the importance to gather more evidence and conduct prospective trials in PSP treatment, where all the important factors such as classification of lung parenchyma changes, size of resected specimen, technique of pleurodesis, application of suction in the early postoperative period, lack of complete postoperative re-expansion, and many more have to be considered.

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