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

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Comment on: Dżeljilji A, Karuś 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.

Submitted Feb 28, 2020. Accepted for publication Apr 07, 2020.
doi: 10.21037/jtd.2020.04.50
View this article at: http://dx.doi.org/10.21037/jtd.2020.04.50

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, Dżeljilji 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 thoracoscopic 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 Dżeljilji 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 Dżeljilji 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 Dżeljilji 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.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, Journal of Thoracic Disease. The article did not undergo external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/jtd.2020.04.50). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are 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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References

1. MacDuff A, Arnold A, Harvey J. Management of spontaneous pneumothorax: British Thoracic Society pleural disease guideline 2010. Thorax 2010;65:ii18-ii31.
2. Czerny M, Salat A, Fleck T, et al. Lung wedge resection improves outcome in stage I primary spontaneous pneumothorax. Ann Thorac Surg 2004;77:1802-5.
3. Dżeljilji A, Karuś 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.
4. Vanderschueren RG. The role of thoracoscopy in the evaluation and management of pneumothorax. Lung 1990;168 Suppl:1122-5.
5. Ng C, Maier HT, Kocher F, et al. VATS Partial Pleurectomy Versus VATS Pleural Abrasion: Significant Reduction in Pneumothorax Recurrence Rates After Pleurectomy. World J Surg 2018;42:3256-62.
6. Sudduth CL, Shinnick JK, Geng Z, et al. Optimal surgical technique in spontaneous pneumothorax: a systematic review and meta-analysis. J Surg Res 2017;210:32-46.
7. Park JS, Han WS, Kim HK, et al. Pleural abrasion for mechanical pleurodesis in surgery for primary spontaneous pneumothorax: is it effective? Surg Laparosc Endosc Percutan Tech 2012;22:62-4.
8. Park S, Jang HJ, Song JH, et al. Do Blebs or Bullae on High-Resolution Computed Tomography Predict
Ipsilateral Recurrence in Young Patients at the First Episode of Primary Spontaneous Pneumothorax? Korean J Thorac Cardiovasc Surg 2019;52:91-9.

9. Choi SY, Du Kim Y, Kim DY, et al. Influence of lung resection volume on risk of primary spontaneous pneumothorax recurrence. J Thorac Dis 2018;10:1622-7.

Cite this article as: Ng C, Maier H, Augustin F. To resect, or not to resect: that is the question… J Thorac Dis 2020;12(10):5262-5264. doi: 10.21037/jtd.2020.04.50