A case that underwent bilateral video-assisted thoracoscopic surgical biopsy combined with left pneumonectomy

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Abstract: A case that underwent bilateral video-assisted thoracoscopic surgical (VATS) biopsy combined with pneumonectomy is presented. The patient developed hypoxia during the contralateral VATS biopsy. His hypoxia was treated with positive expiratory pressure (PEEP) to the dependent lung and apneic oxygen insufflation to the operative lung. The cause was probably airway obstruction due to his intraluminal tumor plus secretions. This case report contains interesting aspects in the anesthetic management.

Keywords: Video-assisted thoracoscopic surgical (VATS) biopsy, Anesthesia, Staging
position it was suctioned, using a fibroptic bronchoscope; 5 cmH₂O of positive expiratory pressure (PEEP) was applied to the dependent lung, with 5 L/min of apneic oxygen insufflation to the operative lung. The reason why we did not apply continuous positive airway pressure (CPAP) is that CPAP might have resulted in worsening conditions of the operative field under VATS, making execution of the surgery impossible. The DLT was placed correctly, but a lot of secretions were seen. After application of PEEP and apneic oxygen insufflation, the hypoxia improved slightly, with the pH, PaCO₂, and PaO₂ values of the Paratrend 7TN of approximately 7.3, 50-60 mmHg, and 60 -70 mmHg, respectively. Several intermittent arterial blood gas analyses showed similar values. Further improvement was not observed until the biopsy of the right side was completed. During the left side VATS biopsy, anesthetic management was fairly uneventful and adequate gas exchange was achieved. After the intraoperative pathological diagnosis had been made, we proceeded to a left pneumonectomy via a thoracotomy. This was performed based on the staging T2,N1,M0 (Stage IIB). His intraoperative and postoperative course from then on was totally uneventful.

Discussion
The final aim of surgical treatment for bronchogenic carcinoma originating from non-small cell lung cancer is complete resection.¹ Therefore, systematic lymph node dissection seems to be one of the most important tasks in order to achieve this once the primary pathogenic diagnosis of lung cancer has been made. Moreover, it will provide more precise N staging.² Thus mediastinal lymph nodal metastases, including ipsilateral and contralateral paratracheal or hilar lymph nodes, is one of the determinants in the indications for surgery for bronchogenic carcinoma, although this remains a matter for debate.²,⁶ Thus, we need to be prepared for the cases that undergo bilateral biopsy by VATS³, who may immediately proceed to tumor resection, as happened in our patient.

There are two issues pertaining to our patient that are important to highlight. Firstly was the severe hypoxemia that occurred during the contralateral VATS lymph node biopsy. It would appear that this occurred due to a combination of excessive secretions, aggravated by obstruction by the intraluminal tumor, despite our confidence in the position of the right sided DLT.⁷ Furthermore, we are concerned that under certain circumstances this intraluminal tumor may develop a ball-valve in the airway.⁸ In addition, VATS usually requires OLV. Therefore one has to have alternative plans to treat hypoxia during VATS biopsy, on a case by case basis.

Secondly one should take into consideration the potential for contralateral VATS related problems during ipsilateral surgery. The lung which was collapsed for surgery might have sustained some damage, even though the surgery did not include lung parenchymal procedures. But, for instance, re-expansion pulmonary edema⁹, massive air leakage, or tension pneumothorax¹⁰ might accidentally occur. These complications could be life-threatening as well as make the scheduled operation impossible, necessitating the possibility of utilizing extra-corporeal lung assist devices.

There is a trend towards more detailed preoperative and intraoperative nodal staging, including VATS biopsy.¹¹ It is true that improvements in surgical and anesthetic procedures have encouraged surgeons to challenge advanced stage lung cancer and establish more precise staging. This article may contain no new suggestions on how to handle these situations, as there are no established protocols; however, we believe that we successfully provided an opportunity to consider and discuss this new trend in the field of surgery and anesthesia.

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References