F-059
SINGLE TWIN-PORT VENO-VENOUS EXTRACORPOREAL LUNG SUPPORT DURING PULMONARY RESECTION IN PATIENTS WITH SEVERELY COMPROMISED PULMONARY FUNCTION
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Objectives: The intraoperative application of extracorporeal lung support (ECLS) during thoracic surgical procedures represents a modern concept with promising results. So far, pumpless extracorporeal interventional lung assist (iLA) and veno-venous or veno-arterial extracorporeal membrane oxygenation (ECMO) via dual cannulation were utilized for complete or partial lung support throughout the surgical procedure. We report the initial intraoperative application of low-flow singular double-lumen veno-venous ECMO for ECLS during lung resection in patients with severely impaired preoperative pulmonary function.

Methods: A total of 4 patients with severely impaired pulmonary function requiring pulmonary resections due to lung carcinoma were included in the current analysis. In all patients, a novel 24 Fr twin-port double-lumen cannula (NovaPort twin, Novalung, Germany) was inserted percutaneously into the right femoral vein for ECLS. In two patients, pneumonectomy for lung carcinoma was previously performed.

Results: The surgical procedures included two anatomic segmental resections, an extended double-sleeve right lower lobectomy with en-bloc resection of segment 2, as well as one VATS lobectomy of the right upper lobe. In both pneumonectomized patients, ECLS allowed for apnoea phases up to 45 min. In the remaining 2 patients with severely impaired pulmonary function, protective low-pressure single lung ventilation was performed uneventfully. All patients were extubated in the operating room. In 3 patients, ECLS was disconnected at the end of the procedure. In 1 patient with persisting hypercapnea, ECLS was weaned and removed 2 h after extubation. During the postoperative course, 1 patient developed severe hypercapnic failure. Non-invasive ventilation was not sufficient. Consequently, the patient was intubated and successfully weaned over a temporary dilation tracheostomy from mechanical ventilation.

Conclusions: The use of this novel cannula during thoracic surgical procedures significantly simplifies ECMO-support for ECLS and contributes to the safe performance of complex surgery in pulmonary compromised patients, thereby minimizing potential complications as seen with other forms of extracorporeal support.

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