Introduction: Adequate gas exchange is crucial during tracheal resection. If the conventional distal endotracheal intubation method is not feasible, extracorporeal oxygenation techniques become an option. Veno-venous (V-V) ECMO has several advantages over other techniques but lower efficacy on gas exchange due to recirculation. We report a successful use of V-V ECMO with a simple O2 insufflation during tracheal resection.

Case presentation: 52 y/o man who presented with squamous cell carcinoma of trachea just above carina. He was scheduled for tracheal resection via right thoracotomy. After thoracic epidural placement, general anesthesia was induced. After adequate mask ventilation, standard endotracheal was placed without difficulty. Because of the proximity of tumor to carina, it was impossible to insert sterile endotracheal tube into distal trachea. V-V ECMO was instituted via femoral and right internal jugular veins. After ventilation cessation, SpO2 went down to about 80%. A decision was made to insert an airway exchange catheter into the left bronchus with O2 insufflation through the catheter. The catheter was re-directed between left and right bronchi by surgeon. With this technique, SpO2 improved to 100%. After Completion of anastomoses, the catheter was removed, ventilation was resumed and ECMO was weaned off. He was extubated in the OR without complication.

Discussion: Extracorporeal oxygenation circuit is an important tool for complex tracheal resection where the conventional distal tracheal intubation is not possible. It also provides excellent surgical exposure. In patients with normal RV function, V-V ECMO has several benefits over veno-arterial (V-A) ECMO or CPB: low risk for systemic embolism/thrombosis, ensures well-oxygenated blood ejected from left ventricle, avoidance of arterial cannulation, and lower risk of limb ischemia. Because of recirculation, V-V ECMO provides SpO2 of only 80-95% without pulmonary ventilation. Airway exchange catheter is a small-caliber catheter with ability to deliver O2 at the distal end. We demonstrated the efficacy of blow-by O2 via tube exchanger in order to improve oxygenation. Its small size minimally interferes with surgical exposure and is easily redirected by surgeon. The O2 flow also protects fluid or tissue spilling into the lungs.

Conclusion: V-V ECMO is a useful extracorporeal oxygenation technique to provide gas exchange during tracheal resection in patient with normal RV function. With some portion of pulmonary shunting, the oxygenation from V-V ECMO is not always guarantee. Combination between V-V ECMO with supplemental blow-by O2 via airway exchanger catheter is an effective, alternative technique for airway management during tracheal resection.