



# Pushing the boundaries of minimally invasive surgery

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The bronchial circulation plays a crucial role in the vascularization of tracheal and bronchial wall.

Tracheal resection or bronchial dissection as part of lung transplantation or sleeve resection could potentially induce ischemia, leading to mucosal necrosis or dehiscence with consecutive air leak of the respective segment.

Circumferential airway resection with end-to-end anastomosis is the most commonly used procedure to treat tumors that invade the distal trachea or carina, even if some surgeons prefer to perform a non-circumferential airway resection with bronchial flap reconstructions aiming to reduce the anastomotic tension (1-3).

For decades, an open surgical approach was considered the gold standard, but lately there has been an extraordinary growth in thoracic surgery with the introduction and development of minimally invasive procedures (4-7).

We have read with great interest the case report published by Chen and colleagues. They described in their paper a non-circumferential resection and reconstruction using bronchial flap (performed with a thoracoscopic approach) and omental flap harvested via laparoscopy (8). There is to date no consensus about both the optimal flap for reconstruction during thoracic surgery procedures, and its harvesting technique.

The authors didn't mention if they performed the carinal resection/reconstruction using a multiport or uniport approach, but regardless of that the procedure, even for expert surgeons, is very demanding. Wright and colleagues did not include

patients with carinal resection in their paper because they believed that those patients “present a unique complication profile” (9). Further to the technical difficulties *per se*, induction therapy could make planes' dissection very challenging.

Several authors have published case series of VATS tracheal and carinal resection and reconstruction with outstanding results (10-13). With regards to the abdominal part, laparoscopic harvest of an omental flap does usually not require advanced surgical skills if dissection of gastroepiploic vessels is not necessary. In case of thin omentum, the division of gastroepiploic is mandatory and the procedure could be difficult for a thoracic surgeon without advanced laparoscopic skills (14).

The case report published by Chen along with other previous case series could help the thoracic surgery community in pushing the boundaries of minimally invasive surgery, performing a very challenging procedure even in expert hands with an open approach.

Nevertheless, it should be kept in mind that, according to the hippocratic “*primum non nocere*”, the safety of the patient must hold the first place in every surgeon's attitude and therefore a multidisciplinary setting with a high expertise in the field of tracheal surgery performed via minimally invasive approach is mandatory.

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