One lung ventilation in a patient with tracheostomy

To the Editor: Providing one lung ventilation (OLV) for thoracic surgery is a challenge when patients are post laryngectomy or have a tracheostomy tube in situ. We anesthetised a patient with carcinoma of pyriform fossa having tracheostomy for video-assisted thoracoscopic (VATS) oesophageal mobilisation as a part of a major surgery using Arndt endobronchial blocker.

A 41-year-old male, with history of hypertension after one year on Telmisartan 40 mg and Hydrochlorothiazide 12.5 mg once daily was diagnosed with squamous cell carcinoma of pyriform fossa after a biopsy. He received radiotherapy and six cycles of Cisplatin chemotherapy for the disease. Due to sudden onset stridor, an emergency tracheostomy was done under local anaesthesia to relieve symptoms. On further investigation, it was found that the disease was involved the upper third of the oesophagus and pharynx as well. The head-neck surgeon planned a total laryngectomy, pharyngectomy, oesophagectomy and gastric pull-up on the patient. A thoracic surgeon was involved for the oesophageal mobilisation for which OLV was required. We induced and maintained with Datex-Ohmeda Avance CS2 work station. A 9 COOK Medical was used to isolate the right lung under an intubating bronchoscope (Olympus). The blocker was placed in the right main bronchus and the cuff was inflated. The position was reconfirmed after turning the patient in the left lateral position. We ventilated the patient using pressure control mode of 12–16 cm of H2O to target an expired tidal volume of 300–350 ml, respiratory rate between 12–20/minute to target an end tidal carbon dioxide of 32–40 mm of Hg, FiO2 of 60%, PEEP of 6 cm of H2O and an I:E ratio of 1:2. The lung isolation was described excellent by the surgeon and there was no desaturation for the entire duration of thoracic surgery with OLV (2 hours). The other surgical procedures were carried out after removing the bronchial blocker and tracheostomy tube and replacing it with a 7.5 sized flexometallie tubing.

 Providing OLV in presence of a tracheostomy is a challenge to the anaesthesiologist, as the available options are limited. A double lumen tube (DLT) can be inserted either through the stoma or orally after removing the tracheostomy tube. By doing so there are lot of advantages like suctioning of isolated lung, oxygen supplementation via cannula or a continuous positive airway pressure (CPAP) using Jackson-Rees circuit in case of intraoperative refractory desaturation. However, there is a possibility of damage to the airway owing to the size of the tube. Also, oral insertion of DLT will be impossible in a patient who has a tracheostomy for airway malignancy. If insertion is done through the stoma, the chances of malpositioning is also high as the DLT is long and the airway gets shortened due to tracheostomy. A detailed assessment of a computed tomography scan of the airway and a fibroptic bronchoscopy to evaluate the diameter and length of trachea and both main bronchus can help in deciding the size of DLT. Similarly, a Univent endobronchial blocker can be inserted from the stoma and right or left lung can be isolated using a specially designed endotracheal tube. The issues described are malpositioning, inability to suction or provide oxygen supplementation or CPAP. An Arndt endobronchial blocker can be inserted with the assembly system provided in the kit and the position can be confirmed using a fibroptic bronchoscope with the tracheostomy tube in place. No additional or special tubes are required to facilitate ventilation. However, just like with a Univent tube, suctioning of isolated lung and oxygen or CPAP cannot be provided. Brodsky has described use of special double lumen tracheostomy tubes for OLV. These are not widely available and not routinely used. Use of Fogarty embolectomy catheter and Foley catheter as endobronchial blocker has also been described. Campos reviewed the available literature to describe the modalities available for providing OLV in patients with difficult airway where he mentioned that in patients with tracheostomy, an independent bronchial blocker should be used.

We isolated the right lung for oesophageal mobilisation as a part of gastric pull up. Lung parenchyma was not a part of surgical intervention directly. Consequently, we did not expect suctioning of the isolated lung and was not required to do so either. As described earlier, there was no desaturation at any point and the patient tolerated OLV very well.

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References

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