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USE OF THE WIRE-GUIDED ENDOBRONCHIAL BLOCKER FOR ONE-LUNG VENTILATION IN PATIENTS WITH AIRWAY ABNORMALITIES

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Introduction: One-lung ventilation (OLV) can be achieved with the use of a double-lumen endotracheal tube (DLT), or bronchial blocker with a Univent, a Fogarty catheter, or a wire-guided endobronchial blocker (Arndt blocker).¹ OLV techniques may be complicated because of the uncommon occurrence of carcinoma of pharynx, tongue or epiglottis. Many of these patients have received neck radiation therapy and extensive neck/tracheal surgery, which may make intubation difficult.² We report 4 cases where the upper and/or lower airway anatomy have been previously distorted due to surgery or radiation, where in all cases successful OLV was achieved with the relatively new blocker, the Arndt blocker.

Case Description:

Case 1: A 61 year-old male scheduled for a right thoracotomy and resection of pulmonary nodule. His past medical history included squamous cell carcinoma at the base of the tongue previously treated with chemotherapy, radiotherapy and surgical resection of the tongue, larynx, epiglottis and tracheostomy four years previously. He was edentulous with a frozen jaw, allowing him to open his mouth less than 1 cm. This made the inspection of the oral cavity and airway difficult. The tracheostomy stoma was closed.

Intraoperative Management: After monitors were placed, topical anesthesia in the nares was applied. An "awake" nasotracheal intubation with fiberoptic bronchoscopy (FOB) guidance was performed with a 7.5 mmI.D. single-lumen endotracheal tube (SLT). It was placed without difficulty. Once tube position was established, general anesthesia was induced, a 9 F Arndt blocker was advanced through the SLT with the guidance of FOB and placed into the right bronchus. OLV was achieved successfully.

Case 2: A 73 year-old male with a right upper lobe lung mass scheduled for a thoracoscopic resection. One year ago he underwent a resection of an angiosarcoma by a left maxilectomy, and tracheostomy. He had received radiation treatment to the face and larynx. There was a facial deformity secondary to the surgical resection and the mouth opened less than 2 cm. His tracheostomy stoma was closed.

Intraoperative Management: An "awake" nasotracheal intubation was performed with an 8.0 mmI.D. SLT under FOB guidance. Then a 9 F Arndt blocker was passed through the nasotracheal SLT with a FOB into the right mainstem bronchus. OLV was successfully achieved

Case 3: A 75 year-old male with the diagnosis of right empyema was scheduled for a decortication. He had a prior aortic valve replacement 4 months previously and required a tracheostomy for respiratory complications.

Intraoperative Management: Under topical anesthesia a Shilley 8.0 mmI.D. tracheostomy tube was placed and the cuff inflated. The multiport connector of the Arndt blocker was attached to the connector of the Shilley tube. A 9 F Arndt blocker was passed through the Shilley tube and guided into the right mainstem bronchus with the aid of FOB. OLV was successfully achieved.

Case 4: A 73 year-old male with a left upper lung mass was scheduled for a lingulectomy. His prior medical history included a right pneumonectomy for primary lung carcinoma.

Intraoperative Management: After induction of anesthesia, and under direct laryngoscopy, an 8.0 mmI.D. SLT was placed. A 9 F Arndt blocker was passed and guided with the FOB into the entrance of the left upper bronchus. Selective left upper lobe blockade was established with expansion of the left lower lobe. One-lobe ventilation was successfully achieved.

Discussion: Distorted anatomy was found in the upper airway (tongue, pharynx, larynx) that precluded the use of the oral airway intubation in cases 1 and 2; therefore the most viable approach was the nasotracheal intubation and passage of the Arndt blocker through the SLT. Also distorted anatomy was found in the lower airway [tracheostomized patient as in case 3 and single bronchus as in case 4] (previous pneumonectomy). Although DLTs and Univents have been used for OLV in patients with difficult airways, the rigidity and external circumferential diameter of DLTs and Univents can make intubation complicated. Among the bronchial blockers the Arndt blocker has many advantages including: a flexible wire loop that serves as a guide when coupled with the FOB to facilitate its placement. Also, an opening channel in the center allows air evacuation or oxygen insufflation. In contrast, Fogarty catheters lack a guide-wire device and do not have an opening channel. Therefore in these four cases our best alternative was to pass the Arndt blocker over an established airway device (SLT or Shilley tube).

Conclusion: We report four interesting cases, two with upper and two with lower airway abnormalities, where the use of the Arndt blocker facilitated lung collapse during OLV or one-lobe ventilation. This bronchial blocker should be considered in patients who require nasotracheal intubation, previous tracheostomy or one-lobe ventilation in previous pneumonectomy patients.

References:

1. Campos JH: Current techniques for perioperative lung isolation in adults. *Anesthesiology* 2002; 97: (In press)
2. Campos JH: Difficult airway and one-lung ventilation. *Curr Rev Clin Anesth* 2002; 22:199-205