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BLIND ENDOBRONCHIAL INTUBATION WITH BRONCHIAL BLOCKER FOR MEDIASTINAL MASS REMOVAL - A CASE REPORT.

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Abstract : One lung ventilation in patients coming for thoracic surgery remains a challenge for anesthesiologists. Double lumen tube, bronchial blocker and endobronchial tubes are the techniques used for lung isolation. Of the above, the Double lumen tube is the commonly performed technique. In certain situations, the DLT s cannot be used or contraindicated, example altered airway anatomy, previous airway surgeries, tracheostomy patients, and pediatric patients. In the above clinical conditions the available option is the bronchial blocker. Because of many disadvantages of the endobronchial tubes are not used. Herewith, we present a case of mediastinal teratoma removal done in a 23 years old patient wit h the use of ARNDT bronchial blocker under blind technique.

Keyword : One lung ventilation, mediastinal mass removal, ARNDT bronchial blocker

INTRODUCTION:

Anesthesiologists are familiar with the clinical assessment of the upper airway for ease of endotracheal intubation. In a similar fashion, each thoracic surgical patient must be assessed for the ease of endobronchial intubation. At the time of the preoperative visit, there may be history or physical findings that lead to suspicion of difficult endobronchial intubation such as previous radiotherapy, infection, and prior pulmonary or airway surgery. Patient chart may have bronchoscopy report with detailed description of anatomic features. The most useful predictor of difficult endobronchial intubation is the plain chest radiograph and the CT thorax. Lung-isolation techniques are primarily designed to facilitate OLV in to protect the lung from soiling by the contralateral lung in such cases as bronchopleural fistula, pulmonary hemorrhage, and wholelung lavage.. Lung isolation is also used patients undergoing cardiac, thoracic, mediastinal, vascular, esophageal, or orthopedic procedures involving the chest cavity .Lung isolation can be achieved by three different methods: DLTs, bronchial blockers, or single-lumen endobronchial tubes. The most common technique is with a DLT. The DLT is a bifurcated tube with both an endotracheal and an endobronchial lumen and can be used to achieve isolation of either the right or the left lung. The bronchial blocker method involves blockade of a main stem bronchus to allow lung collapse distal to the occlusion. These bronchial blockers can be used with a standard endotracheal tube or contained within a separate channel inside a modified SLT such as the Univent tube.

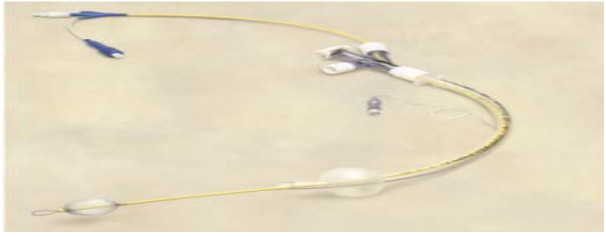
REVIVEW OF LITERATURE:

The bronchial blocker method to achieve lung separation involves blockade of a main stem bronchus to allow lung collapse distal to the occlusion. Bronchial blockers can also be used selectively to achieve lobar collapse if necessary. [1] Currently, several different bronchial blockers are available to facilitate lung separation. These devices are either within a modified SLT as an enclosed bronchial blocker (Torque Control Blocker Univent; Vitaid, Lewiston, NY) or are used independently with a conventional SLT, the Arndt wire-guided endobronchial blocker (Cook Critical Care, Bloomington, IN), the Cohen tip-deflecting endobronchial blocker (Cook Critical Care, Bloomington, IN), and the Fuji Uniblocker (Vitaid, Lewiston, NY).

Bronchial blockers are most commonly used intraluminal (coaxial) with an SLT. They can also be placed separately thorough the glottis or tracheostomy exterior to an SLT. This allows the use of a smaller SLT and is often an option in pediatrics. Another advantage of the bronchial blockers is when postoperative mechanical ventilation is being considered after prolonged thoracic or esophageal surgery. In many instances these patients have an edematous upper airway at the end of the procedure. If a bronchial blocker is used there is no need to change the SLT and there is no compromise of the airway if mechanical ventilation is needed in the postoperative period.

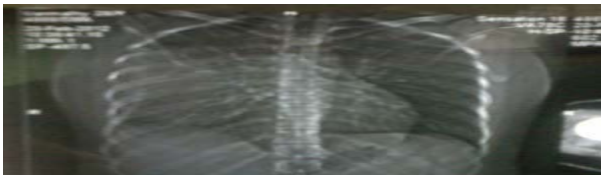
Characteristics of the ARNDT bronchial blocker;

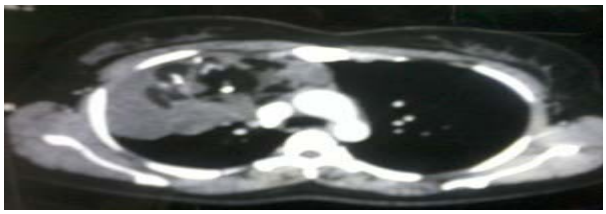
Size	5 Fr, 7 Fr, and 9 Fr
Balloon shape	Spherical or elliptical
Guidance mechanism	Nylon wire loop that is coupled with the fiber optic bronchoscope
Smallest recommended ETT for coaxial use	5 Fr (4.5 ETT), 7 Fr (7.0 ETT), 9 Fr (8.0 ETT)
Murphy eye	Present in 9 Fr
Center channel	1.4 mm ID

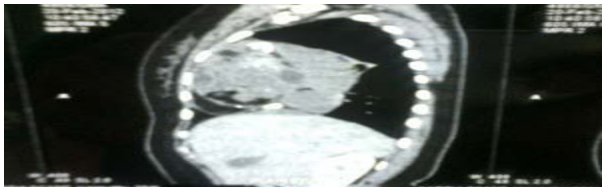


CASE REPORT:

A 23 years old female presented with complaints of chest pain for six months. There was no history of breathing difficulty, no history of orthopnea or PND. Her Investigation showed Hemoglobin 11.2g%, Random blood sugar 120 mg%, urea 42 mg/dl, creatinine 1 mg/dl, ECG WNL; CXR showed trachea in the midline, no mediastinal shift and opacity in right middle and lower lobe. CT Chest showed 20*15*10 cm multiloculated mass in the Right side of the thoracic cavity, compressing the Right middle &lower lobe. No cardiac or major vessel involvement. The iagnosis was MEDIASTINAL TERATOMA.

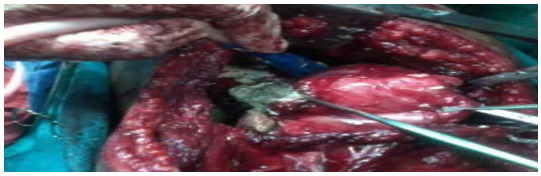






On examination: patient was conscious, oriented, CVS S1, S2 heard. RESP SYSTEM: Left side air entry normal. Right mammary infra mammary, interscapular, infrascapular air entry decreased and apical air entry present. Her Pulse Rate was 78/min, BP 130/80 mm hg. Pre anesthetic evaluation:Airway examination shows MPC II, Dentition, Neck and Back Normal.

The anesthetic plan was awake FOB guided intubation8 with ARNDNT bronchial blocker and one lung ventilation. The patient was premedicated with injection glycopyrrolate 0.2 mg I.m half an hour before the procedure. The oral cavity and pharyngeal wall were anesthetized with 10% lignocaine spray. Superior laryngeal nerve block and Trans tracheal block were given. However FOB failed because of technical difficulties. Hence it was decided to place the bronchial blocker into the Right bronchus under blind technique. A 7.5 size single lumen ETT was taken. We measured the length of the tube by inserting the bronchial blocker inside the ETT from the machine end to patient end; the length of the tube was measured as 35 cms. Addition of 5 cms to block the right main bronchus. Anesthesia plan was changed to induce the patient and to intubate. Pre oxygenation was done with 100% O2 for 3 mints. The patient was induced with injection Thiopentone 250 mg .Under Direct Laryngoscopy, trachea was intubated with 7.5 mm cuffed oral ETT, BAE checked at 21cm length. Then ETT was pushed further, so that its tip enters in to R main bronchus. This was confirmed by the absence of air entry on the left side during auscultation. The bronchial blocker introduced through the ETT into the R main bronchus according to the measurement(i.e. 40cms) and ETT tube was withdrawn back to the previous position i.e. 21 cm length. Bronchial blocker cuff was inflated with 4 ml of air and air entry checked. Right main stem bronchus intubation was confirmed by the absence of air entry on the left side during auscultation. The final position of the bronchial blocker was adjusted by repeatedly checking the right upper lobe air entry. Anesthesia was maintained with N2O: O2 66/33%, and sevoflurane. Muscle relaxation was achieved with Atracurium. Right thoracotomy was done with the patient in left lateral position.



INTRAOP her vitals were stable and pulse rate 70 – 98 / min, BP 100/70 – 130/80 mm hg and spO2 99-100%. 2 liters of crystalloids and 2 units of whole blood were given intraoperatively. Total Blood loss was around 800ml and Urine output was 300 ml. Total duration of surgical procedure was 4 hours. Patient was reversed with injection Neostigmine 2.5 mg and injection Glycopyrrolate 0.5mg, Patient extubated after thorough oraphrayngeal suctioning. Post operatively patient was conscious, oriented, airway reflexes regained, muscle power adequate, vocalization normal and vitals were stable. Patient was shifted to post op ICU for observation. Post op analgesia was achieved with intercostal block and injection fentanyl 25 mic g/hr IV infusion.

DISCUSSION:

The bronchial blockers are the alternative for the double lumen tubes for one lung ventilation in thoracic surgery. DLTs are commonly and routinely used for the lung separation .There are some clinical conditions where the DLTs have no role to play, such as patients with previous oral or neck surgery and tracheostomy7 that present with a challenging airway and require lung separation for intrathoracic surgery5. In these cases the use of a SLT during an awake nasotracheal or orotracheal intubation or via tracheostomy secures the airway and there after an independent bronchial blocker can be placed to achieve lung separation. Another group of patients who may benefit from the use of bronchial blockers are those cancer patients who have undergone a previous contralateral pulmonary resection. In such cases selective lobar blockade with a bronchial blocker in the ipsilateral side improves oxygenation and facilitates surgical exposure. Disadvantages of the bronchial blocker are there, FOB is needed for placement and confirmation of bronchial blocker. This needs higher skills than the placement of the DLTs. Failure to achieve lung separation because of abnormal anatomy or lack of a seal within the bronchus also has been reported. 2 Inclusion of the bronchial blocker or the distal wire loop of an Arndt blocker into the stapling line has been reported during a right upper lobectomy3 and required surgical re exploration after unsuccessful removal of the bronchial blocker after extubation. Time delay in the collapse of the lung and difficulty in the suctioning of the collapsed lung are common because of small size distal port in the bronchial blocker.

CONCLUSION

In clinical conditions where the DLTs are contraindicated6, the only option available for the lung separation is using the bronchial blocker. It requires FOB and more clinical skills for

placement. Most of the anesthesiologists are only familiar with the DLTs for lung separation because limited availability of the FOB. The blind technique placement of the bronchial blocker for lung separation is clinically useful technique when the DLTs are contraindicated or difficulty to place. Blind technique done in the above case was for right main bronchial intubation. This procedure can be done for left main bronchial intubation also, by rotating the ETT 180 degree anti clock wise.

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