International Journal of Research in Medical Sciences
Koli DC et al. Int J Res Med Sci. 2021 Feb;9(2):629-631
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20210457

Case Report

Nasal intubation with bronchial blocker in a patient with difficult airway for thoracoscopic surgery

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Received: 07 December 2020
Accepted: 07 January 2021

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ABSTRACT

We describe a case report of a 49 years old male, a case of Carcinoma tongue with one finger mouth opening operated multiple times, currently presented with pleural based soft tissue lesion in lower lobe of left lung with query metastasis posted for video assisted thoracoscopy surgery (VATS) SOS open thoracotomy and wedge resection of the lesion. Considering difficult airway due to restricted mouth opening we opted for an awake nasal fiberoptic intubation followed by general anaesthesia. One lung ventilation was achieved with Coopdech^{TM} bronchial blocker type A with standard cuff size in left main stem bronchus. Postoperative course of patient was uneventful. In this case report we highlight the importance of use of fiberoptic bronchoscope and bronchial blocker for lung deflation in the management of difficult airway in VATS, as incomplete deflation of the nondependent lung during VATS can lead to poor surgical exposure and inadequate space for surgical manipulation which in turn can compromise the success of the procedure, and may possibly lead to conversion into an open approach.

Keywords: Nasal intubation, Difficult airway, Bronchial blocker

INTRODUCTION

The one lung ventilation techniques are commonly used during thoracic surgeries. A double lumen endotracheal tube or a single lumen tube in combination with a bronchial blocker is generally used for attaining lung isolation via the orotracheal route.[1] However, in patients with a limited mouth opening, it is not possible to establish a patent airway through the oral route. In such scenarios it's important to do careful preoperative planning and multidisciplinary team discussion to formulate a plan to establish patent airway.

Here, we report a case of a patient with limited mouth opening, who was intubated via right nostril, guided by fiberoptic bronchoscope (FOB), after which a CoopdechTM bronchial blocker type A with standard cuff size was introduced with the help of paediatric FOB.

CASE REPORT

A 49 years old male (height 166 cm, weight 53 kg) known case of Carcinoma tongue diagnosed 10 years back, who underwent surgeries multiple times for same with post chemotherapy and radiotherapy status, now presented with chest pain. His Positron emission tomography and Computed tomography (PET CT) showed FDG avid pleural based soft tissue lesion in lower lobe of left lung with query metastasis, hence planned for Video-assisted thoracic surgery (VATS) SOS open thoracotomy with wedge resection of lesion.

A complete pre-anaesthesia assessment was done, routine physical examination was within normal limits, on airway examination he had a mouth opening of 1 finger, Mallampati grade 4, a thyromental distance of 5 cm with restricted neck movements, all routine blood Investigations were within normal limits however his

pulmonary function tests showed moderate restrictive ventilatory defect. Based on the preoperative assessment a multidisciplinary team discussion was done to decide plan to safely establish a patent airway for surgery.

A written, informed consent was taken and patient was explained about awake fibre optic assisted intubation in details. In pre-anaesthesia care unit (PACU), inj. Glycopyrrolate 0.2 mg intramuscularly given and nasal packing was done with 2% lignocaine with adrenalin and xylometazoline soaked nasal patties. Once inside the operation theatre standard monitors including electrocardiogram, Oxygen saturation probe and Non-invasive blood pressure cuff applied. A18-gauge cannula was inserted in a right hand peripheral vein, left radial artery was cannulised under local anaesthesia under all aseptic precautions, following this patient was given sitting position and thoracic epidural catheter was inserted at T6 - T7 level with 18 G tuohys needle, catheter fixed at 10cm mark at skin for postoperative pain management.

A loading dose of dexmedetomidine 1.0 mcg/kg was infused over 15 minutes, 1 mg midazolam and 50 mcg fentanyl was administered intravenously. 3 mls of 2% lignocaine was injected trans- tracheal and 2% lignocaine jelly was instilled in both nostrils, following this a nasal airway number 8 inserted in right nostril for adequate dilation of the nasal cavity, now with patient lightly sedated a fiberoptic scope was then inserted via right nostril negotiated through the vocal cords until the carina was seen and endotracheal tube No 7.5 was railroaded over fibre optic bronchoscope. With the airway secured and end tidal CO2 tracing confirmed, anaesthesia induction was done by administering intravenous fentanyl 50 mcg, propofol 100 mg, atracurium 50 mg. then, CoopdechTM endobronchial blocker was passed through the nasal endotracheal tube and was positioned appropriately in the left main bronchus using a paediatric bronchoscope, the balloon of the bronchial blocker was inflated with 4 mL of air and correct positioning was confirmed with paediatric bronchoscope. Left lung isolation was confirmed by absence of air entry on auscultation on left side then patient was given right lateral position and the location of endobronchial blocker was reconfirmed with Paediatric FOB. During the video assisted thoracoscopic surgery, left lung was successfully deflated and one-lung ventilation was maintained with a tidal volume of 4-5 mL/kg with peak airway pressures below 30 cm H20, and a Positive end-expiratory pressure (PEEP) of 5cm H2O.

General anaesthesia was maintained with air-oxygen-desflurane and a continuous infusion of atracurium, intermittent boluses of fentanyl were used as analgesic. With good left lung deflation, video assisted thoracoscopic wedge resection of lesion was done. At the end of surgery both lungs were inflated adequately but post both lung expansion patient went into sudden hypotension systolic blood pressure dropped from 100 to 65/49 mmHg, HR-88/min, SpO2-100% on pressure control ventilation volume guaranteed (PCV VG) mode of ventilation- Tidal volume- 450 /Respiratory rate 15/PEEP-5/FIO2-60%, peak airway pressure 16 cm H2O, central venous pressure (CVP)- 6-7 cm of H2O, surgeon was informed about the same and fluid and colloid boluses of 1 litre were given over 30 mins, no active bleeding confirmed, injection noradrenalin 4 mg/50 ml 0.9% normal saline infusion started and titrated 0-0.6 mcg/kg/min along with multiple injection phenylephrine 50 mcg boluses given still SBP was between 60 to 70 mmHg, rash seen on left upper chest injection Pheniramine maleate 45.5 mg and injection Hydrocortisone 100 mg IV bolus given and injection adrenalin 4 mg/50ml 0.9% normal saline started and titrated between 0-0.1 mcg/kg/min after starting adrenaline infusion patients' blood pressure gradually came up to normal levels and vasopressors were then tapered gradually and stopped inside operation theatre, patient reversed of neuromuscular blockade, patient was awake following commands but considering sudden hypotension and difficult airway patient shifted on T piece to ICU for observation and subsequently extubated after 4 hours with stable hemodynamics without any vasopressor supports. Patient had minimal pain in postoperative period hence managed with IV Inj. Paracetamol and injection Diclofenac shifted to wards on postoperative day (POD) 3 and discharged on POD6.

DISCUSSION

Most thoracic surgeries require one lung ventilation for clear surgical field and good surgical access. Establishing one lung ventilation is often challenging for anaesthesiologists, especially in patients with difficult airways hence in such cases meticulous evaluation of airway is necessary for establishing plan for securing airway, Double lumen tube (DLT) is the most commonly used device in lung isolation.[2] Advantages and disadvantages of using DLT or bronchial blocker should be discussed beforehand as we know that proper placement of DLT is technically more difficult and requires more expertise compared to putting single lumen tube. Lung isolation can also be achieved by using different equipments like airway exchange catheters, intubation-tool assistance devices such as Glide Scope (Verathon Inc., Bothell, WA), the gum elastic bougie, and the Trachlight (Laerdal Medical, Armonk, NY) for insertion of a double lumen tube.[3] However, due to restricted mouth opening in our patient use of DLT was not possible. In such cases, first choice is using a single lumen tube for endobronchial intubation, despite the fact that there will repeated attempts of tube withdrawal and advancement intraoperatively.[4-6] Another option in difficult airway scenarios is bronchial blocker but in pts with serious obstructive disease or atypical bronchial anatomy, blocker may not produce effective lung isolation.[7] Also, the use of bronchial blocker is restricted due to inability to clear secretions, visualisation of bronchial anatomy of nondependent lung and accurate delivery of continuous positive airway pressure (CPAP) to nondependent lung, with use of bronchial blockers there are high incidences of displacement during patient's positioning.[8] With restricted

mouth opening in our patient oral intubation was not possible, hence, nasal intubation or tracheostomy were the only options. After multidisciplinary team meeting we decided to do awake nasal intubation with FOB and guide bronchial blocker through it for lung isolation. We choose standard endotracheal tube over pliable nasal RAE tracheal tube as it has chances of buckling in oropharynx during bronchial blocker manipulation and bronchoscopy, hence after nasal intubation with standard endotracheal tube the Coopdech™ endobronchial blocker was passed along with paediatric bronchoscope for confirmation of its correct placement.

Hence, we conclude that a Coopdech™ endobronchial blocker passed through a nasal endotracheal tube may be used to achieve one-lung ventilation in a patient with restricted mouth opening. The use of a paediatric fiberoptic bronchoscope helps in guiding the blocker and its correct placement.

CONCLUSION

Hence, we conclude that a coopdechtm endobronchial blocker passed through a nasal endotracheal tube may be used to achieve one-lung ventilation in a patient with restricted mouth opening. The use of a paediatric fiberoptic bronchoscope helps in guiding the blocker and its correct placement.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: De Koli DC, Kadakia AP, Latkar PD, Mehta HH. Nasal intubation with bronchial blocker in a patient with difficult airway for thoracoscopic surgery. Int J Res Med Sci 2021;9:629-31.