

**A Retrospective Study on Fetomaternal Outcome in Gestational Diabetes Mellitus in Tertiary Care Hospital – Case Report**

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**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

**Abstract**

**Introduction:** Foreign body removal from airway in paediatric age group is challenging. As airway manipulation during spontaneous breathing can lead to complications like aspiration, bronchospasm, laryngospasm, difficult access due to vocal cord movements and securing airway with endotracheal tube/tracheostomy tube led to displacement of foreign body.

**Objectives:** Prevent hypoxia with few complications and maximum surgeon comfort during FB removal from airway.

**Methods:** A 13-year-old male child was partially operated for foreign body removal at private hospital, then patient was referred to TBCD department, New civil hospital for the same. On admission CT thorax was

done which showed a 16\*8 mm oval shaped hyperdense lesion with underlying collapsed right lung. Under ASA Class 4E sos post operative ventilatory support child was shifted to OT with SpO<sub>2</sub> 86%, respiratory rate 40-44/min, pulse 118/min & air entry was present only on left side of lungs. Preoxygenation was done with HFNO with O<sub>2</sub> @ 15L/min and patient induced with Inj. Ketamine 30 mg, Inj. Propofol 30 mg Inj. Scoline 30 mg iv & rigid bronchoscopy started. During procedure patient was maintained on intermittent ketofol [1:1] & intermittent scoline with HFNO 50L/min & nasal EtCO<sub>2</sub>, SpO<sub>2</sub>, ECG was monitored. As foreign body was a seed and broken into pieces, 50-60 min was taken to complete the procedure. Whole procedure completed with HFNO without single time bag and mask ventilation.

**Conclusion:** A novel device, HFNO [O<sub>2</sub> @50L/Min] can be used safely for foreign body removal to facilitate un-interrupted bronchoscopy procedure.

**Keywords:** HFNO, Foreign Body Bronchus, Paediatric Patient

### Introduction

Foreign body removal from airway in paediatric age group is challenging for both surgeon and anaesthesiologist, especially from lower respiratory tract. As airway manipulation can lead to complications like displacement of FB, hypoxia, aspiration, bronchospasm, laryngospasm. etc. and securing airway with endotracheal tube/tracheostomy tube led to difficult access to bronchus as well as haring of airway by both anesthesiologist and surgeon poses difficulty in ventilation, maintaining oxygen saturation is a crucial task. We used HFNO (High flow nasal oxygen) to provide safe airway during bronchoscopy in this case.

### Case Report

A 13 year old male child (weight=28 kg) was referred to our emergency department on 13/03/2023 at 4.30 pm, with complaints of breathlessness, dry cough and chest pain for the past one week. Patient was diagnosed to have foreign body in right main bronchus with a failed attempt at bronchoscopic removal at an outside hospital. Also patient's mother gave alleged history of foreign body [some nuts] ingestion one week ago.

Patient was posted for Emergency Bronchoscopy for foreign body removal on 13/03/2023. Pre-anesthetic check up was done. Patient was conscious, oriented to time, place and person with severe laboured breathing with Pulse: 118/ minute, BP:100/68 mmHg and RS finding of reduced air entry in right upper, middle and lower lung zones with SpO<sub>2</sub>: 86% with room air and 97% with 2 Litre O<sub>2</sub> via nasal prongs and RR: 40-42/

MIN and patient was fit under ASA Class 4[E] sos post operative ventilatory support.

Patient was premedicated with inj. glycopyrrolate 0.004mg/kg iv, inj. Paracetamol 15mg/kg iv, inj dexamethasone 0.1 mg/kg iv. Then patient was taken in OT and started High-Flow Nasal Oxygen with initial flow of oxygen at 20 litre/minute with normal saline pint with active humidification. After 3 minutes , Patient was induced with Inj. Ketamine 40 mg iv, Inj. Propofol 40 mg iv, Inj. Scoline 30 mg iv. Patient was maintained on intermittent. Inj . ketofol iv , Inj. fentanyl iv, Inj. Intermittent scoline iv.

After induction patient was ventilated using HIGH-FLOW NASAL OXYGEN with flow rate of 50 Litre/min. As we had to use adult rigid bronchoscope for the patient which almost completely occupy the patient's trachea, during procedure patient was ventilated using a connector attached to rigid bronchoscope with a flow rate of oxygen @ 10 litre/ minute.

Rigid bronchoscope was passed orally and directed into trachea and projected downwards, after visualising carina bronchoscope was directed towards right bronchus. Foreign body was identified, but it was slippery. Initially covering of the seed was rigid, later on seed was broken into 2-3 parts. So total 45 to 60 minutes was taken to complete the procedure. Foreign body was removed using grasper under vision, followed by complete visualisation of tracheobronchial tree using flexible bronchoscope.

Whole procedure completed with HFNO without single time bag and mask ventilation with oxygen saturation maintained above 98% the entire duration. After completion of procedure bag and mask ventilation was performed to know right side air entry. Air entry was

present in right upper and lower zone. Again patient was resumed on HFNO with flow @ 50 litre/minute and gradually tapered with adequate respiration. At the end of procedure patient was conscious with moderate cough reflexes.

### Investigations

**Hb:** 11.4 g/dl,

**PCV:** 33.6%

**TC:** 9600/cmm,

**Platelet:** 4,49,000/cmm

**PT:** 14 sec,

**INR:** 1

**RBS:** 161mg/dl

**ALT:** 12U/L

**Bilirubin [T/D/ID]:** 0.2/ 0.2/ 0.0

**CXR:** Right complete collapse of lungs with ipsilateral tracheal shift

**USG thorax:** predominantly consolidated lung noted along right CP angle, Left CP angle clear , IVC : 9mm , collapsible

**CT SCAN neck [plain + contrast]:** A 16\*8 mm ovoid shaped well defined non enhancing hyperdense lesion in right main bronchus with resultant collapse of right lung parenchyma with sparing of subsegmental portion of right middle lobe .



Figure 1:



Figure 2:



Figure 3:



Figure 4:



Figure 5:

## Discussion

Anesthesia for rigid bronchoscopy in children is a challenging procedure for anesthesiologists, since it is often difficult to maintain the airway for adequate ventilation and oxygenation in patients whose pulmonary gas exchange is already reduced. A variety of ventilatory techniques like HFNO, THRIVE, Mask ventilation, Intubation, Tracheostomy, ECMO etc can be used during rigid bronchoscopy, following hyperventilation with 100 percent oxygen to denitrogenate the lungs and to lower PaCO<sub>2</sub>. For successful bronchoscopy a close association and team work of anesthesiologist, endoscopist and assistants is essential to ensure safety of the procedure. The anaesthetic technique which provides adequate analgesia and muscle relaxation is preferred. Rapid recovery is desirable to enable the patient to cough out secretions or accumulated blood. As IPPV may push FB distally into smaller airways or may cause ball valve effect resulting in distal airway trapping, usually techniques like apnoeic oxygenation with small catheter alongside of bronchoscope, conventional ventilation through side arm of ventilating bronchoscope or use of venturi injector or high frequency jet ventilator are used for ventilation of patient during bronchoscopy. We used HFNO as it was available in our institute after COVID era and it provides humidified oxygenation with adequate PEEP which help to maintain oxygenation and removal of CO<sub>2</sub>. HFNO creates an airway pressure [CPAP] of 2.7 to 7.4 cm H<sub>2</sub>O to facilitate the washout of the nasopharyngeal dead space, decreases the work of breathing, increases alveolar recruitment, prevent development of atelectasis and bronchospasm, reduce naso-pharyngeal resistance and also cause CO<sub>2</sub> washout. This device can titrate the FiO<sub>2</sub> up to 100%.

We could provide uninterrupted airway access to surgeon through the procedure without single time bag and mask ventilation with oxygen saturation maintained above 98% the entire duration.

## Conclusion

From our observation, a novel device, HFNO [O<sub>2</sub> @50L/Min] can provide un-interrupted, safe and adequate oxygenation for rigid bronchoscopy.

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