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Case Report

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Tracheal Tip Occlusion during Nasal Intubation in Dental Surgery. A Rare Complication with Management in a Special Need Child

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Abstract

General anaesthesia is needed in Dental restoration surgery of Pediatric patients to provide comprehensive dental care when conventional dental treatment is not possible. During dental surgery Nasotracheal intubation provide excellent access to oral cavity which facilitates the surgical field. Many complications may occur during nasotracheal intubation including bleeding and injury to the nasopharyngeal airway. The enlarged adenoids serves as a mechanical obstacle on the nasopharynx during nasotracheal intubation. Dental caries is the most common chronic disease of childhood; it can cause severe pain, infection and impaired quality of life. There is a higher incidence of dental caries in patients with special needs because of inadequate plaque removal. Down syndrome children have enlarged adenoids, tonsils and tongue with dental crowding, missing and malformed teeth. This case presents very rare incidence of injury of enlarged adenoid tissue during blind nasal intubation leading to obstruction of the endotracheal tube in a Down syndrome child.

Keywords: Anaesthesia; Enlarged adenoids; Tonsils; Pre-existing narrowed airway

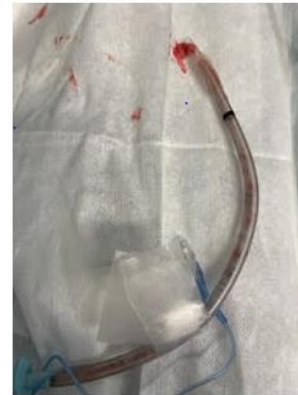
Introduction

Down syndrome is a chromosome disorder associated with an extra chromosome (Trisomy 21) resulting in intellectual disability with specific physical features. Down syndrome is frequently seen in conjunction with other medical problems. There is a higher incidence of epilepsy, diabetes, leukaemia, skin disorders, hypothyroidism and other conditions. Craniofacial complex of Down syndrome is smaller in size than normal individuals. The nasal bone is acutely angled and shorter, with an underdeveloped frontal maxillary process, giving an appearance of a retruded midface. The growth of both jaws is retarded including the ramus and the body. Along with there may be enlarged adenoids, tonsils, and tongues causing obstruction of the pre-existing narrowed airway. Some individuals with Down syndrome experience more frequent sinus and upper respiratory infections which can worsen airway obstruction. Due to non-cooperation , many of these patients are scheduled for dental surgery under general anaesthesia with nasal intubation .In this case we had child with Down syndrome scheduled for full mouth treatment under GA but due to his enlarged adenoids, blind nasal intubation resulted in the trauma of adenoid tissue leading to unexpected obstruction in the endotrachial tube.

Case Report

In this study, a case of 5 year old child, 20kg, height 120 cm was referred to Anaesthesia department for pre-operative assessment before scheduling a dental restoration surgery. Child on general examination, was short stature and had difficulty in speech with physiologically normal vitals .There were clear facial looks of Down syndrome with skin eczema ,high-arch palate and macroglossia. Child also had history of adenoids infection. He had not received any dental treatment before. Labs reports were normal. Since the child was uncooperative so, we discussed and decided that his dental treatment would be done under general anaesthesia in a hospital setting. After primary assessment and detailed history child was referred to a cardiologist, and a general paediatrician, and dermatologist in order to clear his medical status. Parents were explained about advantages and disadvantages of the general anaesthesia and written consent was taken. They were also informed about NPO guidelines. After clearance from cardiology and paediatrician and dermatologist, child was scheduled for dental restoration surgery. Child was premeditated with oral midazolam 10 mg half hour before surgery to reduce the anxiety of child. Monitors like, pulse oximeter, ecg and bp, etco2, temp were connected once child shifted in operation room. General anaesthesia was induced by inhalation through 6 -8%sevoflurane using a face mask along with 50:50 %oxygen and nitrous oxide .According to a standard protocol, an iv line with 24 G cannula was secured medications were given intravenously, Inj glycopyrolate 0.1 mg , Inj Propofol 40 mg , dexamethasone 2 mg and Inj Rocuronium10 mg iv was administered. Otrivin nasal drops were put in both nostrils. Nasal intubation was tried blindly on right nostril with 5 mm reinforced tube. There was difficulty in passing the tube so with some extra adjustments tube was passed and fixed at 17cm and child was ventilated. Ventilator showed high pressure and desaturation to 84 %. The air entry was less bilaterally and child started desaturating. Etco2 waveform was not coming proper. Bleeding was there in oral cavity on direct laryngoscopy. We hand ventilated the child and noted resistance in tube .oral cavity and Endotrache tube was suctioned but suction Cather did not pass well inside the tube. Breathing circuit was again connected and on manual ventilation again resistance was felt, there with

Minimal chest expansion on both sides with inadequate tidal volume alarm on monitor. We then decided to remove the endotracheal tube immediately. On examination of the removed Et tube we find soft tissue at the tip, blocking the tube. It was possibly adenoid tissue. Child was ventilated by mask and suction was done to clear the oral cavity. Otrivin drops.05 % helped in vasoconstriction of the vessels. Once bleeding was stopped by otolaryngologist and endoscopic assessment of nasal cavity was requested. It was not done due to non-availability of small paediatric size fibre optic endoscope in our centre. Now the plan was to try nasal intubation or proceed with oral intubation for surgery. One more attempt through other nostril was decided with a railroad technique. Left nostril was chosen, liberal lubrication was done, Thermo-softening of the endotracheal tubes was done and smaller size ET was selected. A 10 FG soft suction catheter was passed through the floor of the nasal cavity, direct laryngoscopy done and the once the tip of the catheter was visible in the oropharynx, the thumb control part of suction Cather was cut. We used rail road technique to pass the lubricated tracheal tube with gentle pressure on catheter. It passed very smoothly. When the endotracheal tube was visible in the oropharynx, the catheter was gently pulled off, and intubation can be done as usual with help of magills forceps. This method is used to reduce trauma and bleeding to the nasal passages and soft tip catheter acts as nontraumatic pathfinder .Tube was well placed with good bilateral air entry. The case was done in 2 hours. Intra-operatively, paracetamol 15 mg/kg was given, along with Ringer’s Lactate 1⁄2 DNS 150 mL IV. In addition, dexamethasone 2 mg IV was also given with Ondansetron 1.5 mg IV.



Tranexamic acid 200 mg was also infused via IV for management of postoperative haemorrhage and other complications. Atropine 0.06mg/kg and Neostigmine 0.05mg/kg were administered together to reverse muscle relaxation when the dental procedures was completed. Pethidine 10 mg IV was given for effective post-operative analgesia. The child was then shifted to the ward after monitoring for 6 hours in the post anaesthesia care unit. After which he stayed in the ward for 24 hours for observation of any postoperative bleeding, fever or related complications. Child was discharged next day [1-12] (Figure 1).

Conclusion

The enlarged adenoid can sometimes act as a mechanical obstruction in the nasopharynx to complicate the nasotracheal intubation. NTI navigation from the nasal valve area through the nasal cavity to the nasopharynx is always blind so trauma and bleeding is not uncommon. We can take preventive measure to avoid such complications by selecting proper nostril before intubation, otolaryngologist consultation for enlarged adenoids and endoscopic assessment of nasal cavity before endoscopic

assessment of nasal cavity before intubation. Many complications happening while doing the procedure can be operator induced or due to anatomical variations. It is important for the anaesthesiologist to know the basics of nasotracheal intubation in order to manage the complications arising from procedure. Preliminary fiberoptic nasal endoscopy has been suggested to have a role in the anaesthetic assessment and management before nasal intubation. Dental Restoration under GA is definitely more cost effective than repeated dental procedures under sedation.

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