

Tongue Flap Division in a Patient with Suspected Subglottic Stenosis Overcoming the Challenges in Airway Management: A Case Report

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Abstract

Background: Oronasal fistulae (ONF) can remain after surgery in some cleft palate patients. Repairing ONF requires surgery through the intraoral route, which may block the airway during the procedure. Tongue flap surgery is the surgical technique to fix ONF. The latter involves dividing and transplanting the tongue flap from the dorsal tongue to the palate, which can cause many challenges to the anesthesiologist. This is particularly difficult as the nasal route cannot be accessed in pediatric patients undergoing general anesthesia for tongue flap division surgery. We present a challenging case of difficult airway management in a 6-year-old child with tracheal stenosis posted for tongue flap division surgery.

Case Presentation: A 6-year-old male, 15 kg, diagnosed with bilateral cleft lip and cleft palate with tongue flap, was scheduled for tongue flap division and anterior palate fistula repair. Establishing an airway was difficult due to the presence of the tongue flap and a restricted mouth opening. Additionally, the patient had a previous difficult intubations due to subglottic stenosis, documented during anterior palate fistula repair conducted one month earlier. Inside the OT, standard monitors (NIBP, ECG, Pulse oximetry, and a temperature probe) were attached. We planned to perform fiberoptic intubation through the mouth. However, in our setup, the smallest size of ETT that could be loaded over pediatric fiberscope was 4.0 mm, as our institution does not have a neonatal fiberscope. As the previous anesthesia records during ONF repair with tongue flap showed possible intubations 3.5 mm cuffed ETT after the third attempt, we were left with no other option than to use an uncuffed size 4.0mm ETT via fiberscope. We were prepared for the potential challenges and informed the surgeons about alternative options if needed. After preoxygenation, the patient received intravenous (IV) glycopyrrolate 0.01 mg/kg, fentanyl 1 mcg/kg IV and a loading of dexmedetomidine 1 mcg/kg thereafter an infusion of 0.4 mcg/kg/hr IV. Topical anaesthesia was achieved intraorally with 2-3 puffs of 10% lignocaine spray. An uncuffed ET tube of size 4.0 mm was loaded on the fiberoptic scope. The senior consultant, an expert in FOB intubation, attempted oral intubation by gently passing the scope through the side of the tongue flap. Oxygenation was given through nasal prongs, and spontaneous ventilation was maintained. Once the glottic opening was visualized, the tip of the fiberscope was gently advanced and placed just proximal to the vocal cords. At this point, injections of propofol 30 mg and succinylcholine 30 mg were given. The fiberscope was advanced through the vocal cords, and the airway was secured. The surgery took 1 hour, during which the tongue flap was removed, and the palate repair was performed. The patient's recovery was uneventful.

Conclusion: Comprehensive airway management plan should be sorted beforehand to avoid crisis. Intubation via an FOB offers an effective method to secure the airway in such challenging cases.

Conflicts of Interest: The Authors declare no conflicts of interest.

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Introduction

Cleft lip and palate (CLP) are among the most frequent birth defects, occurring in 1 in every 700 to 800 newborns globally. In 1912, a surgeon noted the critical role of an experienced anesthetist in cleft palate surgeries, emphasizing the stark contrast between a successful and unsuccessful operation (1). This highlights the complexity of administering anesthesia in these surgeries, with the majority of complications stemming from difficulties in managing the airway, either during intubation or after the procedure.

There is a risk of developing oronasal fistulae during the treatment of CLP (2), which typically requires transplantation of tongue to close the gap. During division of the tongue flap, airway can be compromised due to the presence of a flap in the intraoral cavity. The present case had another airway pathology along the tongue flap, further complicating the operation. We describe the management of a difficult airway using an oral flexible fiberoptic bronchoscope in a 6-year-old child with tracheal stenosis posted for tongue flap division surgery.

Case Presentation

In this complex case, a six-year-old child presented with bilateral cleft lip and palate (CLP) and an anterior palatine fistula. The child underwent bilateral CLP repair at the ages of two and five. Subsequently, following the palate repair, the child experienced recurrent nasal regurgitation of food and a residual palate defect.

One month prior to the current surgical intervention, the child underwent an on-anesthesia nasal fold repair with a tongue flap. During the procedure, an intubation challenge was encountered. Despite visualizing the glottis and vocal cords using a direct laryngoscope, attempts to intubate with a 5.5 mm cuffed endotracheal tube were unsuccessful. Employing smaller tubes was also impractical as the tube could not be advanced beyond the

subglottic region. Consequently, a 3.5mm cuffed endotracheal tube was utilized for ventilation, raising concerns about subglottic stenosis in the child.

In our case, the iatrogenic challenging airway secondary to tongue flap was further exacerbated by the presence of subglottic stenosis. Thus, we opted to perform oral fiberoptic intubation. One of our primary concerns was identifying the smallest size of endotracheal tube that could be loaded through the fiberscope. Therefore, we endeavored to select the smallest possible 4.0 mm uncuffed endotracheal tube. Inside the OT, standard monitors (NIBP, ECG, Pulse oximetry, and a temperature probe) were attached. We were prepared for potential challenges and informed the surgeons about alternative options if needed. After preoxygenation, the patient received glycopyrrolate 0.01 mg/kg IV, fentanyl 1 mcg/kg IV, and dexmedetomidine 1 mcg/kg IV loading thereafter an infusion of 0.4 mcg/kg/hr IV.

Topical anesthesia was achieved intraorally with 2-3 puffs of 10% lignocaine spray. An uncuffed ET tube of size 4.0 mm was loaded on the fiberoptic scope. The senior consultant, proficient in FOB intubation, attempted oral intubation by gently passing the scope through the side of the tongue flap. Oxygenation was given through nasal prongs, and spontaneous ventilation was maintained.

Once the glottic opening was visualized, the tip of the fiberscope was gently advanced and placed just short of the vocal cords. At this point, intravenous injections of propofol 30 mg and succinylcholine 30 mg were given. The fiberscope was advanced through the vocal cords, and the airway was secured. The surgery took 1 hour, during which the tongue flap was removed, and the palate repair was performed. The patient's recovery was uneventful.



Figure1. Child with tongue flap attached to the palate and limited intraoral space

Discussion

A search into the literature highlights a few case reports of ONF wherein a difficult airway was encountered during the second surgery involving division of the tongue flap. Nasal intubation has been suggested to be avoided in such cases, as the recently constructed flap may get disrupted during the maneuver (3). Ragi Jain et al attempted nasal intubation in a 7-year-old child posted for tongue flap surgery, after many failed intubation attempts, they resorted to oral intubation using a Miller blade (4). Airway management in such cases usually involves two intubation approaches: intubation using FOB or a Miller-type laryngoscope (5,6). Ensure So et al. successfully inserted a 5.0-mm cuffed Ring-Adair-Elwin (RAE) tube using an oral flexible fiberoptic bronchoscope (FOB) in a pediatric patient posted for tongue flap division (7). FOB negotiated the space between the flap and buccal cavity without difficulty. In our patient, we encountered challenges in selecting the appropriate ET tube size which can be reloaded in FOB due to subglottic stenosis. Sahoo TK et.al utilized right molar approach using a Miller straight blade laryngoscope and orotracheal intubation was achieved for tongue flap division surgery (8). Local infiltration and sedation have also been

described as techniques for flap division surgery (9). However, the risk of bleeding and aspiration into an unsecured airway is a major concern.

Conclusion

To this date, no other pediatric cleft lip and palate case with tongue flap and subglottic stenosis has been reported so far. Comprehensive airway management plan should be sorted prior to the operation. Intubation via an FOB offers an effective method to secure the airway in such challenging cases.

Author Contributions

Conceptualization, F.N. and A.S.; methodology, F.N.; software, A.S.; validation, F.N., A.S. and B.A.; formal analysis, F.N.; investigation, A.S and B.A; resources, A.S.; data curation, B.A; writing—original draft preparation, F.N.; writing—review and editing, A.S.; visualization, F.N.; supervision, F.N.; project administration; A.S

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Conflicts of Interest

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