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Case Report

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Halothane Sedation with Local Anesthesia as a Bailout Procedure for Neonate with Subglottic Stenosis and Post-MMC Repair Defect for O-Z Flap: A Case Report

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Abstract

Introduction

Subglottic stenosis (SGS) can develop after intubation in children. With mild subglottic stenosis, children can be asymptomatic. Endotracheal intubation is difficult in infants with subglottic stenosis. Here is a case of subglottic stenosis in an infant planned for flap wound closure managed with sedation.

Case Presentation

A 1-month-old infant for whom thoracolumbar myelomeningocele (MMC) was repaired during her 2nd week of life, then she developed a wound infection on the 4th postoperative day, and after 2 weeks she was scheduled for a wound closure. However, intubation was difficult and rescheduled but with the senior anesthesiologist, it was not possible to intubate, and after discussion with an anesthesiologist sedation and local anesthesia were used to proceed with wound closure with a flap.

Conclusion

Sedation with local anesthesia can be used for neonates and infants with subglottic stenosis when intubation is difficult.

Keywords: Subglottic Stenosis; Sedation; Flap; Case Report; Local Anesthesia; Neural Tube Defect.

List of Abbreviation

CT- Computed Tomography, ENT-Ear Nose and Throat, ETT-Endotracheal Tube, MMC- Myelomeningocele, SGS- Subglottic Stenosis

Background

Subglottic stenosis (SGS) can develop after intubation in children. With mild subglottic stenosis, children can be asymptomatic. We present a case in which a neonate who underwent surgery for myelomeningocele repair presented with subglottic stenosis, and wound closure with a flap was performed with sedation and local anesthesia infiltration.

Case Presentation

A 1-month-old infant for whom thoracolumbar myelomeningocele (MMC) was repaired on her 2nd week of life after she was intubated on the 3rd attempt. The MMC defect was large and repaired in the standard manner but she developed surgical site infection with wound dehiscence on the 4th day, as depicted in Fig 1, at which point we put her on wound care until the wound sites were clean and granulating. After 2 weeks of the 1st surgery, we planned to take her to the operating room for wound closure with a flap. The overall anesthesia procedure was as follows: before induction of anesthesia, the neonate was preoxygenated with 100% oxygen. SpO2 was maintained at more than 91% with a face mask, and there was no respiratory distress, use of accessory muscles,

inspiratory stridor or grunting. Anesthesia was induced with 1 mg/kg fentanyl, 0.2mg of atropine, and 1 mg/kg propofol. The baby was subsequently given 1 mg/kg fentanyl and 1 mg/kg propofol intravenously. The neonate was intubated with an endotracheal tube (ETT) 3 but was difficult to pass through below the cord. Intubation was performed with an ETT 2.5cm despite resistance and the ETT was secured at 8cm of depth. Spo2 was maintained at 88-91%, and surgery was conducted.

During the second surgery for post-MMC repair wound dehiscence and infection, the neonate was induced as above. However, with a good view of the vocal cords, it was not possible to advance 3.0 mm, 2.5 mm or 2.0 mm internal diameter tubes beyond the vocal cords because of resistance. Subsequently, the Spo2 level started to decrease to the level of 60%s'.the patient was ventilated with a face mask and Spo2 was maintained above 91%. Surgery was canceled, and the patient was transferred to the NICU.

After 4 days and put on steroids and a chest x-ray ray taken as shown in Fig 2 she was rescheduled for repair and taken to the OR for the third time and anesthesia was induced with fentanyl, propofol, and succinylcholine. Intubation was attempted with ETT 3 then 2.5cm but failed to pass below the subglottic area. With subglottic stenosis as a diagnosis, the family counseled, but since we do not have direct flexible fiber optic laryngoscopy and the family cannot afford to be referred to the best setup where there is an otolaryngologist and flexible laryngoscope surgery was decided to proceed with sedation and local anesthesia infiltration in the lateral position. Halothane was administered via a facemask and fentanyl was given, Spo2 was maintained above 93% with a face mask throughout the surgery. The patient was positioned in the right lateral position (this position was preferred because there was adequate skin to take for a flap on the left side) and was washed and draped after infiltrating 1 ml of lidocaine with adrenalin diluted in 9 ml of normal saline. The flap was fashioned as an O-Z flap and the wound was closed in 60 minutes. The patient was then awakened from the sedation and transferred to the post-anesthesia care unit with stable vital signs. The family could not afford for CT scan and there was no flexible laryngoscope available to visualize or grade the subglottic stenosis.

Figure 1: Shows wound dehiscence after the primary repair

Figure 2: A Chest x-ray which was taken before her last surgery. The Blue arrow shows site of stenosis

Discussion

Subglottic stenosis is the narrowing of the airway below the vocal cords. It can be congenital or acquired. One of the acquired causes is intubation. Approximately 1-2% of intubated neonates, (which can reach up to 11% for children under 5 years of age) might develop subglottic stenosis after endotracheal intubation [1]. Patients with mild subglottic stenosis are usually asymptomatic with normal respiratory findings [2]. The patient presented here was considered to have acquired subglottic stenosis. Stenosis can develop after intubation due to mucosal injury, especially with traumatic intubation, and may take weeks to develop [3]. The risk factors for developing SGS after intubation include the size of the ETT in relation to the size of the airway, the number of trials, whether it was smooth intubation or traumatic intubation, number of hours/days on ETT and agitation are some of them to mention [4].

To the best of the author's knowledge, this is the first case in which subglottic stenosis and neural tube defect were reported in an infant who underwent surgery and subsequent surgery was performed with local anesthesia and sedation. In resource-limited setups such as ours, it might be difficult for definitive management of stenosis to proceed with general anesthesia. All methods of tracheal intubation or other ways to proceed with surgical management should be exhausted before considering tracheostomy in infants [5].

The level and severity of neural tube defect with complete sensory loss need to be taken into consideration when administrating local anesthesia. A child similar to our patient in relation to subglottic stenosis but with inguinal hernia underwent surgery with spinal anesthesia in Japan and an infant with SGS and tracheoesophageal fistula was repaired with laryngeal mask due to failed intubation [6,7].

Had this been in well-developed countries or where ENT specialists and flexible laryngoscopes were available, it would have been easier to manage the stenosis with an endoscope and proceed with wound closure.

Subglottic stenosis can be caused by intubation and can also cause difficulty during intubation. The use of all modalities to give general anesthesia should be attempted before proceeding with tracheostomy if possible. With experienced hand sedation with LA is also a bail-out option for infants and neonates with difficulties to proceed with general Anesthesia.

Declaration

Consent for Publication

Written informed consent was obtained from the patient's legal guardian for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-chief of this journal if requested.

Availability of Data and Material

All the data generated or analyzed during this study are included in this published article [and its supplementary information files].

Competing Interest

The authors declare that they have no competing interests.

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Author's contribution MA: Conception and design, acquisition of data, drafting and revising the article

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Authors' information

The corresponding author, MA, is an assistant professor of neurosurgery and operated on this patient both for MMC closure and flap wound closure.

References

1. Derowe, A., & Wasserzug, O. (2011). Subglottic stenosis: current concepts and recent advances. *International Journal of Head and Neck Surgery, 7*(2), 97-103.
2. Ohsima, N., Amaya, F., Yamakita, S., Nakayama, Y., Kato, H., Muranishi, Y., ... & Sawa, T. (2017). Difficult tracheal intubation and post-extubation airway stenosis in an 11-month-old patient with unrecognized subglottic stenosis: a case report. *JA Clinical Reports, 3,* 1-4.
3. Dorris, E. R., Russell, J., & Murphy, M. (2021). Post-intubation subglottic stenosis: aetiology at the cellular and molecular level. *European Respiratory Review, 30*(159).
4. Rutter, M., & Kuo, I. C. (2020). Predicting and managing the development of subglottic stenosis following intubation in children. *Jornal de Pediatria, 96*(1), 01-03.
5. Shamshery, C., Kannaujia, A. K., Madabushi, R., & Priya, V. (2018). Asymptomatic congenital subglottic stenosis in a neonate–infant feeding tube as a "Guardian angel!". *Saudi journal of anaesthesia, 12*(2), 357-358.
6. Doi, Y., & Ekuni, S. (2023). Anesthetic management of inguinal hernia in an ex-premature infant with subglottic stenosis: a case report. *JA Clinical Reports, 9*(1), 60.
7. Páez, J. J. L., & Navarro-Vargas, J. R. (2013). The use of laryngeal mask in an infant with subglottic stenosis—Case report and literature review. *Colombian Journal of Anesthesiology, 41*(2), 150-154.