DOI: 10.7860/IJNMR/2024/73793.2428

Case Report

Paediatric Surgery Section

Unravelling Anaesthetic Challenges in Neonate with Cavernous Haemangioma: A Case Report

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ABSTRACT

Haemangiomas are developmental vascular abnormalities characterised by hyperplasia of blood vessels, usually veins and capillaries. Haemangiomas show a higher prevalence in females. More than 50% of lesions are found in the head and neck region, with a particular preponderance over the face, lips, buccal mucosa, tongue, palate, and trunk. The aetiology can be neoplastic or reactive, influenced by factors such as hormones, infections, and trauma. Large lingual vascular malformations may present with obstructive symptoms, including difficulty in breathing, chewing, swallowing, and speech, which can lead to delays in linguistic development and compromised airway function. Haemangiomas are more susceptible to trauma, which can result in bleeding and further compromise the airway. Typically, this kind of presentation is managed conservatively until obstructive symptoms arise, at which point surgical removal or local site steroid instillation is considered. Here, a case of a 28-day-old child with a cavernous haemangioma of the tongue who was scheduled for excision and instillation of Kenacort injection at the base of the tongue has been reported. Due to the child's small age and the presence of a lingual mass, the use of intravenous anaesthetic agents was precluded. In this case, because of the non-availability of a paediatric fibreoptic bronchoscope, blind nasal intubation was considered for securing the airway. Managing a compromised airway is a challenging situation, even for an experienced anaesthesiologist, in a routine operating room set-up. However, maintaining spontaneous ventilation is a crucial element during general anaesthesia.

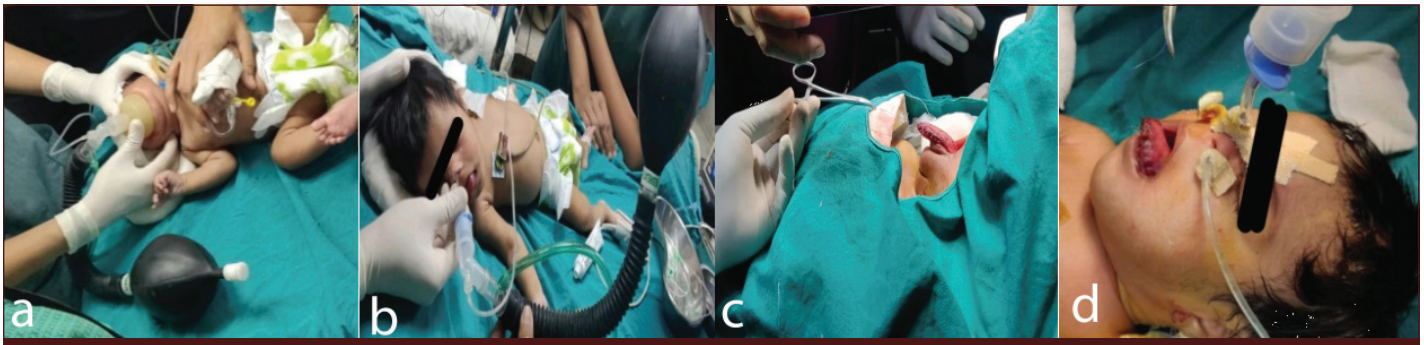
Keywords: Bleeding, Corticosteroid, Difficult airway, Nasotracheal intubation

CASE REPORT

A 28-day-old female infant weighing approximately 3.1 kg was scheduled for excision of a cavernous haemangioma of the tongue, located on the lateral and dorsal aspects, with the instillation of an injection of Kenacort (triamcinolone) at the local site. Her birth history indicates she was delivered at full term via normal vaginal delivery and spent four days in the Neonatal Intensive Care Unit (NICU) due to jaundice. She has had a vascular malformation since birth, which has caused her to experience respiratory difficulties. Magnetic Resonance Imaging (MRI) findings revealed a lesion measuring 52×37×33 mm at the local site, exhibiting early enhancement and local persistence of contrast, suggestive of a haemangioma of the tongue.

During the pre-anaesthetic evaluation, the patient presented with a respiratory rate of 40-46 breaths per minute and exhibited chest indrawing. The remainder of the systemic examination was within normal limits. The possibility of other congenital abnormalities was ruled out. The patient was advised to be kept nil per os for two hours for clear fluids and four hours for breast milk. Informed and written high-risk consent was obtained from the parents in light of the anticipated difficult airway, with tracheostomy as a potential requirement, as well as the possibility of postoperative mechanical ventilation. Preoperatively, an injection of ceftriaxone (150 mg) and oral propranolol were administered according to body weight. Anaesthesia plan was to proceed with nasal intubation under inhalational anaesthesia after achieving adequate depth of anaesthesia.

As per institutional protocols, the Operation Theatre (OT) was prepared and kept warm, considering the paediatric age group to maintain normothermia. The difficult airway cart was made ready due to the anticipated difficult airway. After shifting the patient to the OT, standard ASA monitors-such as Electrocardiogram (ECG), Non invasive Blood Pressure (NIBP), and SpO_2-along with $EtCO_2$ monitoring, were attached. An intravenous access of size 24 G was secured over the left dorsum of the hand inside the OT under inhalational anaesthesia using oxygen, nitrous oxide, and sevoflurane.



[Table/Fig-1]: a) Pre-oxygenation of the neonate; b) Placement of nasal endotracheal tube with $EtCO_2$ monitoring; c) Intraoperative dissection of cavernous haemangioma; d) Picture after surgical excision of cavernous haemangioma.

Pre-oxygenation was performed for five minutes [Table/Fig-1a], and an adequate depth of anaesthesia was achieved. The right nostril was lubricated with lignocaine jelly. Due to the non-availability of a paediatric bronchoscope, blind nasal intubation was attempted. The first attempt at blind naso-endotracheal intubation was unsuccessful. Pre-oxygenation with 100% oxygen was repeated, and another attempt was made to place the endotracheal tube nasally [Table/Fig-1b]. To facilitate easier placement, the tongue was protruded using a suture tied to it. Successful placement of a size 3.0 mm uncuffed endotracheal tube was achieved, and bilateral air entry was confirmed, further validated by $EtCO_2$ monitoring. Oral packing was performed, and the surgery proceeded uneventfully. The plane of anaesthesia was maintained with an inhalational anaesthetic agent and muscle relaxants. Intraoperatively, blood loss of 40 mL was replaced with an adequate amount of maintenance fluid and packed cells. Upon completion of the surgery, as shown in [Table/Fig-1c,d], thorough oral suction was performed, and the oral packing was removed. Haemostasis was achieved, and a trial of extubation was conducted. The patient was conscious, crying, and moving all four limbs. Postoperatively, the neonate was shifted to the NICU for observation.

DISCUSSION

Haemangiomas are developmental vascular benign tumours characterised by proliferative endothelial cells, rapid growth, and an involution phase. The pathophysiology of haemangiomas is characterised by an imbalance in angiogenesis, resulting in uncontrolled proliferation of vascular substances [1-3]. According to reported literature, 80% of patients have a single lesion, predominantly located in the head and neck region [4]. Management of haemangiomas includes observation for spontaneous involution, intra-lesional corticosteroid therapy, embolisation, excision, injection of sclerosing agents, cautery of the tumour, photocoagulation, and immunomodulatory therapy [5].

Haemangiomas of the tongue are rare tumours that can cause various problems, like cosmetic concerns, risk of haemorrhage, and functional issues affecting phonation, swallowing, and mastication. In this particular case, the patient experienced symptoms of respiratory obstruction due to the tongue haemangioma. Considering the size of the oral cavity, the enlarged tongue, and the patient's young age, securing the airway would be challenging even for an experienced anaesthesiologist. Due to their vascular nature, surgical resection carries a higher risk of bleeding and increased chances of soiling the respiratory tract. In this case, the tongue was involved, making it more susceptible to trauma and subsequent bleeding, as well as causing difficulty in swallowing and obstructive symptoms. Ketamine and sevoflurane are suitable for rapid induction, offering the shortest induction time and excellent intubating conditions without serious respiratory or haemodynamic adverse events [6,7].

Elective tracheostomy in paediatric patients is particularly challenging, even for an experienced surgeon. In difficult airway scenarios, fibreoptic-guided intubation plays a key role. However, due to the unavailability of a paediatric fibreoptic bronchoscope, the final approach for securing the airway was either nasal or oral placement of the tube, guided by laryngoscopy or performed blindly. Given that this was a case of cavernous haemangioma, which is prone to bleeding, the procedure was planned for atraumatic blind naso-endotracheal intubation. Blind naso-endotracheal intubation carries its own complications, such as airway trauma and an increased risk of bleeding [8].

A senior anaesthesiologist with experience in blind nasal intubation attempted the procedure with spontaneous ventilation while the patient was in a lateral position, using a combination of O_2, N_2O, and sevoflurane with a Jackson-Rees (JR) circuit. The patient was successfully intubated with a 3.0 mm naso-endotracheal tube on the second attempt, without any complications like bleeding or desaturation. Although, we have advanced airway adjuncts to address difficult airway situations, we cannot completely eliminate the blind technique. In this case, where a paediatric fibreoptic bronchoscope was unavailable, planning for blind nasal intubation proved to be uneventful.

Hajipour A et al., reported a case of an 18-month-old boy who had a huge lingual mass diagnosed as a haemangioma, for which excision was planned. Due to the size of the mass, an attempt was made to manually decompress it. With the availability of an experienced anaesthesiologist and surgeon, as well as, a difficult airway cart, general anaesthesia with inhalational induction was planned. The patient was premedicated with atropine, and the plan of anaesthesia was achieved with the help of halothane. The tongue was pulled out to facilitate laryngoscopy. The patient was intubated with a cuffed endotracheal tube of size 3.5 mm, and anaesthesia was maintained with isoflurane. After the mass was excised, the patient was transferred intubated to the Paediatric Intensive Care Unit (PICU). Extubation was planned for 48 hours later, assuming there was no respiratory or airway compromise [2].

Baraka A reported a case of a five-year-old boy diagnosed with a giant lingual haemangioma, which was managed successfully through decompression of the tongue followed by inhalational induction using sevoflurane after the placement of an oral airway [9]. Therefore, even for a skilled anaesthesiologist, managing a compromised airway can be a challenging scenario in a typical OT set-up. Nonetheless, maintaining spontaneous breathing is the most important component of general anaesthesia.

CONCLUSION(S)

Cavernous haemangiomas are rare lesions predominantly found in the head and neck regions. Due to their vascular nature and the risk of trauma during manipulation, airway management can be challenging for even experienced anaesthesiologists. A well-formulated airway management plan and vigilant monitoring can help prevent serious complications in an operating room setting.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Jun 28, 2024
- Manual Googling: Aug 21, 2024
- iThenticate Software: Aug 27, 2024 (5%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jun 25, 2024**
Date of Peer Review: **Aug 08, 2024**
Date of Acceptance: **Aug 28, 2024**
Date of Publishing: **Dec 31, 2024**