INTRODUCTION

Congenital epulis is a benign soft-tissue lesion of the alveolar mucosa. It may be sessile or pedunculated and vary in size from several millimetres to a few centimetres.[1,2] Surgical excision is the treatment of choice. The most important aspect of pre-anaesthetic evaluation is assessment for difficult airway. Literature on the anaesthetic management of neonates with congenital epulis is limited to a few isolated case reports.[3,4] We discuss the development of post-intubation tension pneumothorax and pneumoperitoneum in a neonate with an anticipated difficult airway due to an intra-oral giant epulis.

CASE REPORT

A 7-day-old 2.2 kg female neonate with an intra-oral epulis originating from the maxilla was scheduled for excision with wide base resection of the tumour [Figure 1]. The child had presented with feeding difficulties but no respiratory obstruction.

In the pre-operative assessment, difficult airway was anticipated. Mouth opening, submandibular space and neck movements were normal, but the oral cavity could not be evaluated due to the presence of intra-oral mass (4 cm × 3 cm). Difficult airway trolley was prepared with paediatric sizes of oral and nasal airways, bougie, endotracheal tubes, laryngoscope blades and fibre-optic device. In the operating room, non-invasive blood pressure, electrocardiography and pulse oximetry were attached, and end-tidal carbon dioxide monitoring was done during mask ventilation and eventually after intubation. Inhalational induction was performed with sevoflurane, and after securing an intravenous catheter (24-gauge in the right upper limb and 24-gauge in the left lower limb), a check laryngoscopy was performed. The mass was non-pedunculated and an attempt made by an assistant to displace the mass from the line of vision was unsuccessful. Cormack-Lehane grade was 4 and external laryngeal manipulations could not improve the laryngeal view. Paraglossal straight blade technique also failed. Flexible fibre-optic bronchoscopy was attempted, cords were visualised but endotracheal tube could not be negotiated. Oxygenation was maintained with interrupted attempts of mask ventilation. Eventually, the mass started to bleed and transient episodes of desaturations occurred. Size 1 laryngeal mass airway (LMA) was successfully inserted and the mass excised as a rescue measure which facilitated visualisation of the glottis and intubation of trachea with a 3.5 mm uncuffed endotracheal tube. The neonate developed desaturation, bradycardia, hypotension, increase in airway pressure, subcutaneous emphysema and hyper-resonant right chest half an hour after intubation and positive pressure ventilation. Tension pneumothorax was suspected and managed with insertion of an 18-gauge intravenous catheter in the second intercostal space, followed by chest tube insertion [Figure 2]. Haemodynamics were managed with administration of atropine and adrenaline, followed by dopamine and dobutamine infusions. Paediatric maintenance solution was administered based on Holliday and Segar formula, and bolus dose...
of 10 ml/kg of normal saline was administered twice during haemodynamic deterioration. The neonate developed abdominal distension and a provisional diagnosis of pneumoperitoneum was also made as the abdomen was resonant on percussion.

The neonate was shifted to Neonatal Intensive Care Unit in view of haemodynamic instability and hypothermia (34°C). Haemodynamics were stabilised and the trachea was successfully extubated after 6 h. Oxygenation and ventilation were supported intermittently with nasal continuous positive airway pressure for the next 24 h. She was shifted to the ward on day 4 and intercostal drain was removed on day 6.

Consent from the patient’s parents was taken for publication of this case report.

**DISCUSSION**

Intubation using neonatal flexible fibre-optic bronchoscopy is technically challenging. Due to the presence of large arytenoids (greater than one-half of entire length of laryngeal inlet) and angled vocal cords, LMA can be used as a rescue device and Brimacombe has reported successful insertion of size 1 LMA in seven neonates with weight <2.5 kg. The lower limit suggested by them is 1 kg. The child in the present report was intubated because the LMA was limiting the space available for the surgeon to suture the maxilla and achieve haemostasis. In addition, the neonate had developed hypothermia (34°C) and we anticipated prolonged ventilation and delayed awakening. There was no difficulty in ventilating the neonate at any time before or after intubation.

Paraglossal straight blade intubation technique has been recommended in patients with oropharyngeal lesions and difficult airways. Case reports describe successful excision of pedunculated epulis with the use of local blocks. Protection of the airway from secretions and blood in an awake neonate is a major advantage, but operating on a crying and mobile neonate is the main disadvantage. We attempted a conventional intubation because we routinely do not use paraglossal straight blade technique and thus have limited skill in its use. Flexible fibre-optic bronchoscopy is also challenging in a neonate. A low threshold for surgical airway in the form of a tracheostomy is warranted to prevent life-threatening complications.

Fatal outcome has been reported in a neonate with bilateral tension pneumothorax, following rigid bronchoscopy. Multiple airway manipulations, use of fibre-optic bronchoscopy and positive pressure ventilations causing barotrauma could have contributed to the development of tension pneumothorax and pneumoperitoneum in our case.

Intraoperative pneumothorax has been reported after central venous cannulations, brachial plexus and intercostal block, tracheostomies and nephrectomies. Incidence is increased in neonates with congenital diaphragmatic hernia and respiratory distress syndrome. Spontaneous pneumothorax is reported in 0.05%–1% of neonates, but bronchopulmonary foregut malformations such as bronchogenic cysts, congenital pulmonary airway malformation, bronchial atresia and congenital pulmonary cysts further increase the risk of pneumothorax.

Escape of air from thoracic to abdominal cavity through patent pleuroperitoneal shunts, diaphragmatic hiatus, foramen of Bochdalek and Morgagni or the retroperitoneal space is also one possibility.

**CONCLUSION**

Airway manipulations in a neonate with an anticipated difficult airway can lead to barotrauma, post-intubation tension pneumothorax and pneumoperitoneum. Flexible fibre-optic bronchoscopy is technically challenging in the neonate and LMA can be used as a rescue device in low birth weight babies.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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