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Case Report

Anaesthesia Section

The Difficult Paediatric Airway: Two Cases of large Cystic Hygroma

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ABSTRACT

This is a report of a two cases of difficult intubation experienced in paediatric surgical cases. Both the infants, aged one and three-month-old respectively, had very large cystic hygroma of the neck area. Prior hematological and radiological investigations (USG and CT scan of the swelling) and preanaesthesia check up was done and cases were posted for surgical excision. Case I had difficult airway due to pressure of the tumour/cystic hygroma over the airway and posed difficulty for intubation, but was managed well. Case II had respiratory distress during preoperative period. She had been postponed for surgical excision of the cystic hygroma of neck twice due to the difficulties experienced during intubation. Needle aspiration of hygroma fluid helped to reduce the respiratory distress, and the size of the tumour as well, which further helped in the smooth intubation after a week. The postoperative period was uneventful in both the infants.

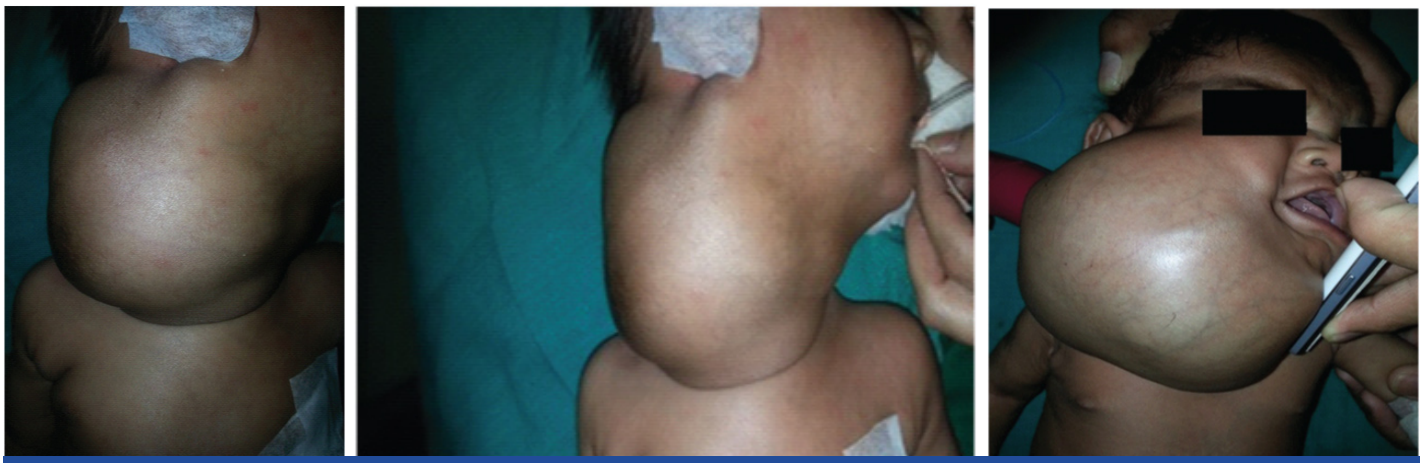
Keywords: Anaesthesia, Failed intubation, Infants, Neck mass, Surgical excision

CASE REPORT

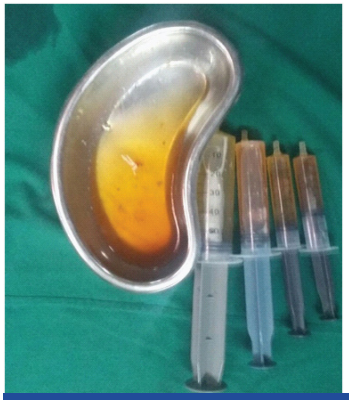
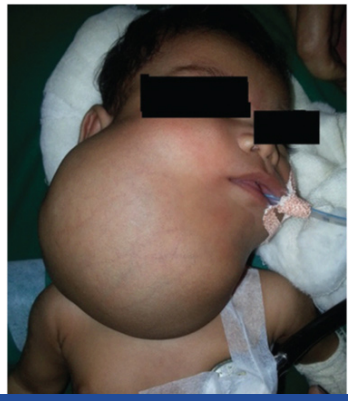
Case 1: One-month-old male infant was posted for surgical excision of a large cystic hygroma of right side of the neck. Clinically it was 10x8 cm, soft, non-tender and occupied anterior, lateral and posterior aspect of the right side of neck [Table/Fig-1,2]. His other clinical examination and routine investigations were normal. His USG and CT scans of neck swelling revealed "multicystic swelling", occupying right posterior cervical space, displacing the right sternomastoid laterally and also displacing trachea, oropharynx, and other right great vessels towards medial side. Appropriately sized facemasks, oral airway, LMA, Laryngoscopes (Miller and Macintosh blades) endotracheal tubes with stylettes, etc were prepared prior to intubation. Child was induced using incremental Sevoflurane up to 8% in 50% oxygen and 50% nitrous oxide. An oral airway was inserted for improvement in airway maintenance, and ventilation was gently assisted. Muscle relaxants were not used. When the required plane of anaesthesia for laryngoscopy and intubation was achieved, direct laryngoscopy with external laryngeal manipulaton revealed a laryngeal view of Cormack and Lehane grade III. Orotracheal intubation was successfully done but only in third attempt using a Miller blade. Per-operative monitoring included ECG, non-invasive blood pressure, SpO_2, capnography and concentration of oxygen and inhalational anaesthetics. During the entire surgical procedure (surgical excision of cystic hygroma), spontaneous breathing was adequately maintained and no episodes of hypoxaemia or coughing were noted. The subsequent course of anaesthesia, extubation, immediate and late postoperative period in recovery room and postoperative ward were uneventful.

Case 2: Three-months-old female infant with a large cystic hygroma of neck with least mandibular space was posted for surgical excision. Clinically, she also had mild respiratory distress. Clinical examination of the swelling revealed that it occupied the anterior, lateral and posterior right side of neck, and also involving the right side of face, it was soft, cystic, and non-tender [Table/Fig-3]. Her other clinical examination and routine investigations were normal. Her USG and CT scans of neck swelling revealed a multiloculated, cystic swelling, 9x9x8 cm, occupying right posterior cervical space, submandibular space, and prevertebral space and retro-pharyngeal space. The swelling was also displacing the trachea, oropharynx, and other right great vessels towards medial side.

The course of anaesthesia was same as that was planned for the case one. During laryngoscopy, we observed that there was negligible mandibular space. All the structures in the oral cavity were elevated and the epiglottis was partially visible and looked that it was a vertical paramedian structure. Glottis was not visible at all. Multiple attempts at laryngoscopy and intubation were tried, using different sizes and types of blades and change of hands as well. Keeping in view of multiple attempts taken, we decided not to



[Table/Fig-1]: Photograph of case 1 showing large cystic hygroma right side of the neck **[Table/Fig-2]:** Photograph of case 1 showing cystic hygroma and endotracheal tube (Journal does not encourage the images/treatment without gloves) **[Table/Fig-3]:** Photograph of case 2 showing large cystic hygroma involving right side neck and face.

[Table/Fig-4]: Photograph of hygroma fluid, aspirated from cystic hygroma of case 2
[Table/Fig-5]: Photograph of case 2 showing smaller size of cystic hygroma and endotracheal tube

proceed as there was risk of local trauma, bleeding with additional risk of laryngeal oedema. Surgical excision in this case had been postponed a week earlier due to similar problems. Keeping in view the difficulties in intubation, it was decided by the surgeon in charge of the case to aspirate the hygroma fluid to partially reduce the size, and it would help in smooth intubation after few days. About 250 ml of hygroma fluid was aspirated [Table/Fig-4], this aspiration of hygroma fluid not only helped in the reducing the size of the swelling, but also helped in relieving her respiratory distress.

After a week she was again posted for surgical excision of the cystic hygroma, and at that time the swelling was smaller, less tense, and baby was not in respiratory distress [Table/Fig-5]. Antisialagogue was given and child was induced with Sevoflurane in incremental doses. When adequate plane of anaesthesia was attained, intubation was achieved in very first attempt as distorted anatomy was not too much of a problem. A complete surgical excision of the cystic hygroma was done. Per-operative, extubation, and postoperative period were uneventful.

DISCUSSION

Paediatric airway management is usually considered difficult for less experienced and trainee anaesthesiologists. This is because in infants aged less than four months, the epiglottis is higher (at the level of the first cervical vertebra) and there is relative macroglossia. An awake fibreoptic intubation may be the gold standard in the management of the known difficult airway, but may not be a suitable option for children because of inability to co-operate [1]. An anticipated difficult airway needs good preoperative preparation, and help from senior collegues to deal with difficult airways, more so in infants [2,3]. Failed endotracheal intubation is always a major concern for anaesthesiologists because of the devastating outcomes associated with it. Sharing of methods, views and experiences in securing a difficult airway that help in preventing adverse events should always be done [3]. The reported incidence of difficult direct laryngoscopy and intubation is 1.5-8.5% for general anaesthetics, while incidence of failed intubation is reported in 0.13-0.3% of general anaesthetics [4]. Sophisticated equipment like paediatric fibreoptic bronchoscope is not available everywhere and one must know how to deal with a difficult airway in infants and children. Help and guidance from senior colleagues is foremost important, as sought by the consultant in our second case. Should intubation prove impossible, the anaesthetist must have a plan of how to proceed to avoid a "cannot intubate, cannot ventilate" (CVCI) situation. Regrouping, change of blade type and size with surgical help for tracheotomy should be at hand. It is even better to abandon the procedure in order to prevent trauma and severe laryngeal oedema due to multiple attempts, if not a life saving emergency, as was done by our team in our second case [4].

Airway management in infants poses additional risk in case of any deviation from normal anatomy which is seen in babies with craniofacial and congenital disorders [5,6]. Kim H, et al., reported their experience with a 30-day-old baby with a large cystic hygroma on the left side of neck. As in this case, we used gaseous induction with Sevoflurane, decided to withhold muscle relaxants and keep the patient on spontaneous respiration because of difficult airway [6]. Muscle relaxants should be withheld, until the airway is secure. Use of a muscle relaxant during induction of anaesthesia may result in a situation where the anaesthetist can neither intubate nor ventilate and require an urgent surgical way to obtain airway. Intubation should be performed under inhalational anaesthesia [7,8]. In our hospital, either Halothane or Sevoflurane are used for inhalational induction. Sevoflurane, the least irritant of all the available agents, is emerging as a choice of inhalational agent, in both adults and paediatric patients [9,10].

CONCLUSION

A large swelling involving the neck area may result in deviation of the trachea, and in such cases success in obtaining an emergency surgical airway would be improbable, if not impossible. Therefore, help from senior collogues, surgical teamwork, avoidance of muscle relaxants, use of inhalational anaesthesia and knowing when to abandon the procedure to avoid adverse events are all crucial in the management of a difficult airway, especially in infants.

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