

Cystic hygroma: A difficult airway and its anaesthetic implications

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ABSTRACT

A 2-month-old child presented with gross and huge swelling on the left side of the neck with difficulty in feeding. It was diagnosed to be cystic hygroma and a decision was made to excise the swelling to enable the child thrive better. Difficult intubation was anticipated and the child was intubated with inhalation induction. The intra-operative period was smooth and the tumour was excised completely. Post-operatively, it was decided to ventilate the child because of airway difficulties.

Key words: Cystic hygroma, difficult airway, neonatal anaesthesia, neonatal intensive care unit

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INTRODUCTION

Significant differences exist between airways of the neonate and the adult. Anaesthetic management of the airway may be challenging in neonates and young infants with large neck mass like a huge cystic hygroma because these patients are at risk for sudden complete airway occlusion resulting in hypoventilation and hypoxemia. Cystic hygroma is a benign tumour composed of large lymph-containing cysts. Lymphangiomas of head and neck region frequently present challenges to the anaesthesiologists due to extension in the neck, airway and thorax. We describe the difficulties encountered in intubation and post-operative care of the patient.

CASE REPORT

A 2-month-old baby girl weighing 3.5 kg presented with a huge swelling on the left side of her neck. The swelling was small in size when noticed at birth, which progressed gradually to the present size [Figures 1 and 2]. The child presented with a huge swelling with restricted mouth opening and difficulty in feeding. Examination revealed swelling on the left side of the neck sized 10 cm × 10 cm, which was

cystic, non-tender and extending from the angle of the mandible to the clavicle. The skin over the swelling looked normal with no local rise of temperature. The swelling was huge and presented with difficulty in swallowing. In anticipation of rupture of the swelling and aspiration of its contents and also because it could lead to airway obstruction, it was decided to operate the child.

Pre-operative evaluation was thoroughly carried out. Evaluation for concurrent anomalies like Down's syndrome, Turner syndrome or congenital heart defects was done. The size and extent of the neck mass was defined carefully in an effort to detect the potential for airway compromise and to avoid soft tissue trauma during intubation.^[1] Chest X-ray was done to exclude the presence of chest infection and intrathoracic extension of the tumour.

A rescue tracheostomy by the surgeon was available as a standby during induction.^[2]

Because cystic hygroma presents with difficult airway challenge to the anaesthesiologist, a difficult airway cart was kept ready. The child was premedicated with intravenous (IV) atropine 70 mcg. A shoulder roll was used to keep the child at optimal laryngoscopic

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Figure 1: Cystic hygroma-Anterior view

position as the child had a larger occiput compared with the rest of the body. Because a larger tongue in the child could obstruct the airway after induction, an inhalational induction was considered.^[3]

As sevoflurane was not available in our institute, the child was induced with halothane in oxygen by face mask. A straight blade laryngoscope was used as children have an anterior, cephalad placed larynx and short and stout epiglottis.^[3] Halothane does not have a noxious smell and is still commonly used for the gaseous induction of anaesthesia in places where budgetary concerns limit the use of sevoflurane.^[4] At first attempt, laryngoscopy was difficult as the vocal cords were not visualised and only the epiglottis could be visualized, which was shifted to the right side due to displacement of the soft tissues. The child was ventilated with mask and a second attempt of laryngoscopy was made. This time the glottis could be seen after shifting the soft tissues towards the left side by the assistant and the trachea was successfully intubated with uncuffed endotracheal tube (ETT) size 3.5 mm, and it was fixed just 1 cm beyond the vocal cords in order to avoid accidental extubation. Anaesthesia was maintained with 66% nitrous oxide in oxygen with controlled ventilation with Jackson Rees modification of Ayre's T piece. Inj. Fentanyl 8 mcg and Inj. atracurium 2 mg was administered and supplemental doses 0.1 mg/kg were used as and when necessary. Blood loss throughout the surgery was calculated to be about 100 ml and was replaced. The cysts were multiloculated and excised completely. All the vital signs were stable in the intra-operative period. At the end of surgery, the child was reversed with Inj. Neostigmine 0.05 mg/kg and Atropine 0.01 mg/kg. In view of possible collapse of trachea and obstruction to



Figure 2: Cystic hygroma-Lateral view

airflow, it was decided not to extubate the trachea in view of the difficulties faced during intubation.

The child was shifted to the Neonatal intensive care unit and was extubated on the second post-operative day after return of adequate muscle power, respiratory efforts, cry and movements.

DISCUSSION

Cystic hygroma, also called cavernous hemangioma, is a histologically benign congenital tumour of lymphatic origin.^[5] Endothelial membranes sprouting embryonically sequestered lymph vessels form fimbriae that penetrate into surrounding normal tissues, canalizing and producing large multiloculated cysts filled with serous secretions.^[6] Cystic hygroma presents in neonate and early infancy and it also occasionally presents at birth and may present with obstructed labour.^[7]

The most prominent sign of cystic hygroma is presence of a mass. Interference with normal breathing and swallowing are the second and third symptoms to appear.^[8] For an infant needing removal of cystic hygroma, it is most important for the anaesthetist to understand the range of invasion into the respiratory tract by the cyst and prepare for airway management.

The prime consideration in managing this case is securing the airway. Newborn infants are difficult to intubate, and the success ratio of intubation is only 60 on the first attempt. In addition, because newborn infants are prone for early development of hypoxia, it is recommended to limit the intubation duration to less than 20 s.^[9]

Intubation should be carried out under general anaesthesia or deep sedation, and it is preferable to maintain spontaneous ventilation until trachea is successfully intubated.^[10] Halothane does not have a noxious smell and is still commonly used for the gaseous induction of anaesthesia in places where budgetary concerns limit the availability of sevoflurane.^[4] In our case, halothane was gradually increased to induce loss of consciousness while maintaining spontaneous ventilation as sevoflurane was not available.

The second problem is about airway maintenance during surgery. Considering the surgical position of hyperextension and right rotation of the neck, the tube was fixed at a depth of 1 cm proximal to the carina. The possibility of accidental extubation of the endotracheal tube or endobronchial intubation should always be considered.^[9]

Behaviour of cystic hygroma is unpredictable. Sometimes, cysts expand rapidly and, occasionally, respiratory difficulty ensues.^[7] Post-operative complications include respiratory obstruction in 1.5% and oedema of the tongue.^[11] Inflammation and infection of the cyst can occur at any time following upper respiratory tract infection.

CONCLUSION

Because of airway irregularities due to mass effect, it can present as an airway challenge to the anaesthetist. The anaesthetist needs to consider not only induction and endobronchial intubation but also intra-operative management of the endobronchial intubation, accidental extubation and anticipation of possible post-operative complications. One should

plan to extubate the child post-operatively after good respiratory efforts, cry and movements in view of the airway irregularities and difficult intubation. A definite plan for can't intubate can't ventilate (CICV) situation, with available equipments before proceeding with further management, is essential.

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