Case Report

Anaesthetic Management of a Neonate with Huge Cystic Hygroma
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ABSTRACT:
We discuss here the case of a 7 day old neonate with a huge cystic hygroma on the left side of the neck invading the major vessels of neck, facial nerve, strap muscles and sternocleidomastoid. Anaesthetic implications in this case were maintaining airway patency after induction, difficult intubation, risk of perioperative dislodgement of tube and judgment of proper time for extubation. Following gaseous induction and adequate mask ventilation, patient was intubated with muscle relaxant. Intraoperatively to avoid accidental extubation, we chose to manually hold the endotracheal tube after fixing it. At the end of relatively uneventful surgery, we could extubate the patient in the operation theatre. The patient was shifted to Neonatal Intensive Care Unit for observation. Post-operatively on the 3rd day, facial asymmetry was observed. Patient was discharged on the 21st day.

Key words: cystic hygroma, neonatal anesthesia

INTRODUCTION:
Cystic Hygroma is a developmental malformation arising from the vascular lymphatic system. The size of the mass along with difficulty in respiration and swallowing are the reasons for seeking medical attention. Literature does not abound with reports of anaesthetic management of a huge cystic hygroma, many of which reveal difficulty in securing airway and maintaining it due to surgical manipulation1. Intrathoracic extension has to be ruled out by chest x-ray even in absence of respiratory distress. CT scan is required for further investigation if intrathoracic extension is suspected.

CASE REPORT:
A 7 day old neonate was posted for surgical removal of cystic hygroma on left side of the neck. The mass was diagnosed on antenatal Ultrasonography performed at 34 weeks of gestation. A planned Cesarean Section was performed at 37 weeks, delivering a 3.5 kg female child who was immediately shifted to Neonatal Intensive Care Unit. Cervical Ultrasonography performed on the 2nd day of life revealed a huge cystic swelling of approximately 15x25x10 cm³ with septations, extending from submandibular region to the supraclavicular region. It invaded the common carotid artery with its branches, internal jugular vein, facial nerve with its branches, strap muscles and the sternocleidomastoid. Chest X-ray ruled out intrathoracic extension. Clinically the trachea was deviated to right side. Surgical excision was planned on 7th day of life. Preoperative weight of the baby was 3.5 kg.

With informed written consent, patient was brought to the operation theatre. Patient had a running Intravenous line with 22G cannula. Pulse oximeter, Non-invasive Blood Pressure, Electrocardiogram and Temperature Probe were applied. Inj. Glycopyrrolate 0.02mg/kg IV, Inj. Fentanyl 1 µg/kg and Inj. Paracetamol 10mg/kg IV were given as premedication. Inhalational induction was done with sevoflurane. As expected mask ventilation was difficult, but was facilitated by lifting the mass. After ensuring adequate mask ventilation and achieving adequate depth, Inj. succinylcholine 2 mg/kg was given to facilitate intubation.

Direct laryngoscopy revealed epiglottis deviated to the right at 2 o’clock position. Patient was intubated with uncuffed portex Endotracheal tube of 3 mm ID and was confirmed by ventilation and End Tidal Carbon dioxide tracing.

After checking breath sounds over both lung fields, endotracheal tube was fixed meticulously with elastic adhesive tape at 9cm following which Inj. Atracurium 0.5 mg/kg IV was given. Patient was
maintained on N₂O in O₂ (50:50), 1-2 vol % sevoflurane and controlled ventilation along with Atracurium top up doses of 0.3 mg.

We opted to manually hold the tube at the tip throughout the surgery to avoid any mishap. Surgery lasted for 3.5 hours. Fluid management was done with 25% Dextrose and Isolyte-P (1:4) 150 ml and 70 ml of Packed Cell Volume. Throughout the surgery our patient maintained O₂ Saturation of 98-100% and was hemodynamically stable. Urine output was 20 ml. Inj. Dexamethasone was given to prevent supraglottic edema.

![Preoperative](image1) ![Day 2 Postoperative](image2)

At the end of surgery, patient was warmed by a radiant body warmer to 36°C and then reversed with Inj. Neostigmine 0.05mg/kg and Inj. Glycopyrrolate 0.02mg/kg satisfactorily to allow extubation. Patient was observed in Operation Theatre for one hour to deal with any immediate upper airway complications, but none were encountered and patient maintained the oxygen saturation with hood. Thereby, our patient was shifted to Neonatal Intensive Care Unit for continuous observation, oxygen support. Adrenaline by racemic nebulisation and proper fluid management. On 3rd postoperative day, left sided facial asymmetry was observed. Otherwise our patient had a stable postoperative course. Feeding by nasogastric tube was started on 5th day. Facial asymmetry was recovered on 10th day and our patient was discharged on 21st day.

**DISCUSSION:**

Neonates owing to their high O₂ consumption, lesser muscle composition and thoracic cage structure are at high risk of desaturation in cases of prolonged laryngoscopy. Even in expert hands owing to anatomical peculiarities, successful intubation at 1st attempt occurs in 60% cases only. Superimposed on these facts, a huge lump in neck deviating the trachea makes the situation challenging. An Awake intubation by fibreoptic laryngoscopy is also not a feasible option in neonates. In such anticipated difficult airway we had chosen inhalational induction with sevoflurane before giving muscle relaxant to ensure adequate mask ventilation while maintaining spontaneous respiration of the patient. Since our patient did not have extension into the mouth, we underwent a successful laryngoscopy. Cervical extension for positioning associated with possible traction on larynx and airway during surgery may lead to accidental extubation as median bronchus length is 45.6 mm in neonates and cervical vertebra extension can change the endotracheal tube tip position by 10mm.

However, epiglottis was deviated to the right side by the mass, but external manipulation by qualified help allowed successful intubation. Presence of expert assistance and all standby preparations for tracheostomy are very crucial for successful airway management in such case.

Hynzu Kim et al. reported dislodgement of endotracheal tube preoperatively which led to desaturation requiring discontinuation of surgery and re-intubation. This not only lengthens surgical time but repeated airway manipulation increases chances of post-operative group. Preoperative reference to this literature allowed us to remain vigilant throughout the surgery about accidental extubation.

To avoid such a mishap, we chose to manually hold the tube at tip despite fixing it with elastic adhesive tape.

Time of extubation of this patient is also a challenge as damage to 7th, 11th and 12th nerve is reported in 20% cases of excision of cystic hygroma and even phrenic nerve damage has been reported. However with a smooth intraoperative course and adequate respiratory strength upon reversal we could extubate the patient.

**CONCLUSION:**

Management of neonates with huge cystic hygroma requires adequate preparation and vigilance not only for securing the airway, but also for the intraoperative
management of tube, avoiding accidental extubation and determining the appropriate time for extubation postoperatively.

REFERENCES:


