Anaesthetic Management of a Neonate with Giant Cystic Hygroma

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Cystic hygroma, which originates from embryonic lymphoid tissue, is a benign tumour without any potential for malignancy. It is commonly located in the neck area. Anaesthetic management of a large neck mass may be challenging due to difficulty in intubation and the severe haemodynamic effects of surgical removal of a giant tumour. Serious consequences such as sudden airway occlusion resulting in hypoventilation and hypoxemia may arise. We present the anaesthetic management of a 15-day-old infant who underwent surgical removal of a cystic hygroma located on the left side of the neck. Anaesthesia was induced by mask ventilation with sevoflurane in 100% oxygen and intubation was carried out while maintaining spontaneous ventilation. The endotracheal tube was sutured to the tip of the right lip to avoid movement or extubation. In addition to arterial cannulation for invasive blood pressure monitoring, central venous catheterization for perioperative fluid management was put in place. After 6 hours of surgery, the infant was transported to the neonatal intensive care unit and was extubated without difficulty the next day. Facial nerve injury was observed to be temporary.

Key Words: Giant cystic hygroma, anaesthesia, newborn

Introduction

Intubating a neonate with a giant lump on the neck is difficult. The anaesthesiologist must be ready to face various problems that may arise with respect to airway management in these patients. Even an anatomically normal respiratory tract is susceptible to upper airway obstruction, and respiratory distress can easily develop. Muscle composition, structure of the thorax, functional residual capacity and oxygen consumption must be taken into consideration, especially in newborn and young infants who have more limited reserves. Thus, airway management of a newborn infant with a giant cervical mass may be an exceedingly difficult task. In addition, haemodynamic alterations following excision of a giant lump may lead to serious problems in a neonate.

Case Report

A term neonate was referred to the Department of Paediatric Surgery because of a giant mass in the left cervical region after delivery via Caesarean section. The left cervical lump was observed during the 27th week prenatal ultrasonography of the infant’s 32-year-old mother. The possible diagnosis was established as cystic hygroma after ultrasonography and magnetic resonance imaging. An anaesthesia consent form had been obtained from the parents of the patient. And also a consent for scientific publication of patient’s medical informations and photograps from parents had been obtained. Surgical excision of the mass was scheduled for treatment (Figure 1).

The anaesthesiologist observed a mass in the left cervical region that extended to the base of mouth in the preoperative examination. The neck of the patient was in a hyperextended position due to its large size (13x15x13 cm). The baby was breathing and sucking without any problem and weighed 3550 g (Figure 2).

Before transfer to the operating room a 27 G cannula was inserted through a peripheral vein, and iv fluids were started. Standard monitoring consisting of ECG, non-invasive blood pressure and pulse oximetry was used intraoperatively. Neck extension was not easy because of the mass, and intubation was performed by two anaesthesiologists, one of them helping positioning by lifting the neck. Five percent sevoflurane in 100% oxygen was applied through a facemask, while the baby was breathing spontaneously (Figure 3). Laryngoscopy was difficult because the mass was pushing the tongue up from the floor of the mouth.

The epiglottis could only be visualized using a size 0 Macintosh Blade and intubation was performed with a cuffed, size 3 endotracheal tube. The location of the tube was verified with auscultation of each hemithorax. The tube was sutured to the lips in order to prevent its dislocation. Rocuronium 2 mg was given, and anaesthesia was maintained with 2-3% sevoflurane. Doses of 0.5 mg rocuronium were repeated if needed. For prevention of upper airway oedema, 5 mg methylprednisolone was given intravenously. Due to the large surgi-
cal excision, and the anatomical location of large adjacent vessels, haemodynamic monitoring and treatment of blood and fluid loss were important in this case. For this reason, invasive arterial blood pressure monitoring was instituted using a brachial artery cannula, and a central venous catheter was inserted through the femoral vein. A urinary catheter was placed to monitor urine output, and a rectal temperature probe was inserted. Surgery lasted 6 hours, and the observed vital signs were within the following ranges: systolic blood pressure 52-72 mm Hg, diastolic blood pressure 28-34 mm Hg, pulse rate 106-145 beats per minute and end-tidal carbon dioxide tension 34-40 mm Hg. Body temperature ranged between 36.3 and 37.2°C and SpO₂ between 97 and 99%.

During the operation, Lactated Ringer’s solution at a rate of 9 mL h⁻¹ and dextrose solution at 15 mL h⁻¹ were given in a 1:3 ratio. To replace blood loss, 50 mL of crythrocyte suspension was transfused. Urine output was 30 mL. At the end of the operation, the patient was transferred to the neonatal intensive care unit. For the treatment of upper airway oedema, 1 mg dexamethasone was given. The patient was extubated on the second postoperative day. No problems were encountered in the airways after extubation, but left facial nerve injury was observed. The patient was discharged on the 24th postoperative day. Healing of the facial nerve injury was observed at the 2-month follow-up visit.

Discussion

Cystic hygroma is a congenital, developmental malformation originating from the lymphatic vascular system and has no malignant potential. It can arise anywhere within the body; however, 70-80% of cases are located in the neck, particularly in the left posterior cervical triangle (1). Treatment choices include continued observation, repetitive suction, injection of curing agent into the mass, radiation therapy and radio frequency treatment (2, 3). However, the only radical treatment method is surgical removal. General surgery is performed when the patient is 18 months to 2 years old (4). In this case, the size of the lump was exceptionally large and it was likely to cause respiratory distress or swallowing difficulties; it was thus considered for immediate surgical removal (4, 5). As a difficult airway was predicted in this case, anaesthesia was induced by inhalation during spontaneous breathing, and endotracheal intubation was performed. Furthermore, the surgical team was ready to aspirate the fluid within the lump to facilitate airway management (4).

Given the difficult surgical dissection and large surgical field, another possible problem was displacement of the endotracheal tube out of or further down the vocal cords or into the bronchus, even by simple flexion or extension of the cervical vertebra (6, 7). In order to prevent displacement, the tube was sutured to the lips after verifying the location of the tube with auscultation of each hemithorax. Extubation time is also very important at the end of the operation. It is known that paralysis of the 7th, 11th and 12th cranial nerves occurs in 20% of patients undergoing cystic hygroma removal (3). This paralysis occurs due to traction of the nerves during surgery and is generally reversible (7). In this case, the patient was extubated on the second postoperative day with no adverse events, although the neonatal intensive care team was ready for reintubation. Left facial nerve paralysis, which healed in the second postoperative month, was observed. The patient was discharged on the 24th postoperative day.

Conclusion

In this case report, we have described the anaesthetic management of a newborn with a cervical tumour. Intubating the patient without stopping spontaneous breathing, and suturing the endotracheal tube to keep it in place were crucial aspects of the anaesthetic care. Haemodynamic monitoring for effective treatment of probable blood loss and preventing hypothermia are critical factors in anaesthetic management. We believe that the decision to extubate should not be taken in a short time.
Conflict of Interest
No conflict of interest was declared by the authors.

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Informed Consent: Written informed consent was obtained from patients who participated in this case.

Author Contributions

References