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Case Report Open Access

Management of Difficult Airways due to Cervical Teratoma Presenting with Respiratory Distress at Birth: Reports of Two Cases

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Abstract

Difficult airway is common among paediatric patients not only because of their peculiar anatomy or pathological conditions but also because of their low oxygen reserves and high metabolic rate which predisposes them to quick oxygen desaturation during laryngoscopy and intubation. The case reports are aimed at describing the airway management of two neonates with huge cervical teratoma with features of airway obstruction. Both neonates were successfully intubated with uncuffed endotracheal tubes under deep inhalational anaesthesia with halothane and spontaneous ventilation. One of the neonates suffered brief period of hypoxia due to failed attempt at laryngoscopy but was quickly corrected by assisted ventilation with facemask. We highlight the need to identify and anticipate difficult airway in neonates with cervical teratoma so that adequate preparation in terms of airway equipment and anaesthetic techniques can be made beforehand.

Introduction

Cervical Teratoma is a rare tumor of the neck made up of a variety of tissues (nerves, cartilage, skin and thyroid, among others) that come from more than one embryonic layer [1]. It may cause airway obstruction which can be life threatening and accounts for up to 45 percent of mortality associated with Cervical Teratoma [1]. Surgical excision requires safe and secured airway for good ventilation and oxygenation which can be very challenging to the Anesthesiologist. It is usually diagnosed immediately after birth, however recent advances in medicine have made prenatal diagnosis possible using ultrasound [2,3].The two cases of cervical teratoma presented in this reports were diagnosed after birth due to lack of comprehensive antenatal care.

Case Reports

Case 1

B.B was a 5day old male neonate delivered by caesarian section to a 30yr old mother on account of obstructed labour. He was admitted with a history of a right-sided neck swelling which was noticed at birth. The swelling was associated with difficult and noisy breathing. He was assessed by the pediatric surgeon who made a diagnosis of congenital cervical teratoma with airway obstruction and recommended surgical excision as soon as possible. At the preoperative visit, the above history was noted. He was in mild respiratory distress evidenced by the used of accessory muscles of respiration. His respiratory rate was 40cycles per minute with reduced air entry bilaterally and inspiratory stridor. There was a huge right sided mass measuring 8 by 10cm in its widest diameter (Figure 1). The X-ray of the neck showed a soft tissue mass with compression and left lateral deviation of the trachea. Chest x-ray showed normal lung fields and cardiac shadow. He was classified as ASA IV according to American Society of Anesthesiologist risk classification.

In the operating theatre pre anesthetic check was conducted to ensure that anesthetic machine, and appropriate airway equipment such as straight blade Magill's paediatric laryngoscopes, stylet, non-cuffed endotracheal tubes of different sizes. The patient was pre-oxygenated for about 3 to 5 minutes and premedicated with 0.1mg of atropine. Deep inhalational induction was achieved with incremental dose of halothane up to 3.0% in 100% oxygen until intubating condition was achieved. The first and second attempts at intubation with size 3.5mm uncuffed endotracheal tube guided with a stylet were not successful due to poor laryngoscopic view using Macintosh blade. The patient was allowed to breathe spontaneously via face mask for another 3-5 minutes and a third attempt using the Magill blade provided a better laryngoscopic view and the trachea was intubated and right placement of tube confirmed. Anesthesia was then maintained with halothane, nitrous oxide in oxygen administered via the T-piece breathing system and ventilation assisted. A cervical mass weighing 800g was excised in an operation that lasted for 90 minutes. The vital signs were all within normal limits during the operation except for a brief period of oxygen desaturation during failed attempts at intubation. Reversal of residual anaesthetic, awake extubation in the theater and post operative care were all uneventful.

Figure 1: before and after surgery.

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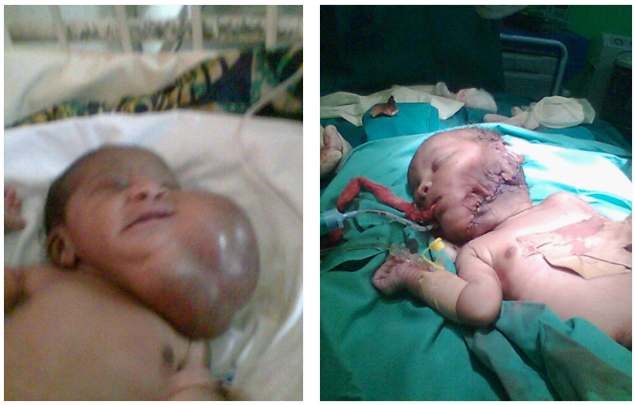

Figure 2: before and after.

Case 2

Baby A.M was 3day old male full term neonate with a history of neck swelling at birth. He was delivered by spontaneous vaginal delivery in a local hospital to a 30yr old mother. The pregnancy was not supervised in hospital. There were no other associated congenital abnormalities. There was associated respiratory distress and difficulty with breast feeding. A clinical assessment of cervical teratoma with partial airway obstruction was made and patient was prepared for surgical excision under anaesthesia. At the preoperative visit the above history was noted. There was a huge cervical mass covering the left lower jaw, and the anterior neck region which measured 15x20cm. It was not tender, cystic and lobulated. The respiratory rate was 44 per minute with expiratory stridor. X-ray of soft tissue of the neck showed compression and deviation of trachea to the right. Diagnosis of cervical teratoma with respiratory obstruction in a full term neonate was made. He was placed in class IV of the American Society of Anesthesiologist risk classification.

In the theater, equipment check and preoxygenation with 100% oxygen was done, anesthesia was induced with incremental dose of halothane in oxygen until adequate level of anesthesia with spontaneous ventilation was achieved. Direct laryngoscopy was performed with Magill's laryngoscope while an assistant supported the mass. The laryngeal inlet was finally visualized and the trachea was intubated with size 3.5mm non-cuffed endotracheal tube after two failed attempts. After each failed attempt the baby was allowed to breathe spontaneously with occasional assistance with face mask until good oxygenation was achieved. Successful excision of the mass was done in a procedure that lasted 2 hrs. Anaesthesia was uneventful and patient was extubated while awake in the recovery room without significant signs of airway obstruction.

Discussion

Congenital cervical teratoma is a recognized cause of difficult airway. It is a rare tumor with an incidence of 3% of all teratomas of childhood [1]. They are derived from all three germ cell layer and may contain various tissues. The vast majority are histologically benign but the significant size they may attain can cause life threatening airway obstruction by mass effect on the airway leading mortality to due to hypoxia and acidosis [1,4]. Study by Jordan and Gauderer [4] showed neonate born without respiratory distress has better outcome (2.7% mortality rate)than those born premature(100% mortality rate) or new born with respiratory distress from airway obstruction(43.4% mortality rate).The reported cases fall into the last group with mortality rate of 43.4%, however both neonates were successfully managed surgically and discharged home.

Advances in medicine have made possible prenatal diagnosis of cervical teratomas using ultrasonography [2,3]. The technology and skilled manpower to perform such prenatal diagnosis is lacking in many hospitals including where the reported cases were managed, however where prenatal diagnosis is possible early multidisciplinary management and treatment using the Exutero Intrapartum Treatment (EXIT) procedure has been shown to be successful with reduce mortality from airway obstruction [1-3]. It involves performing cesarean section and partial removal of fetal part (head shoulder and upper limbs) through hysterotomy. The essence is to maintain uteroplacental and fetal circulation so that the airway of the fetus can be intubated without hypoxia from airway obstruction and to allow surgical excision all at one sitting. The reported cases were diagnosed after birth and already had airway obstruction with some degree of hypoxia. The neck swellings could not be detected prenatally in both reported cases due to poor antenatal services.

Other congenital causes of difficult airway include cystic hygroma, branchial cyst, haemangioma, syndromes like Dawns ,Treacher Collins, Pierre Robin's and laryngeal atresia or stenosis [5,6] The difficult airway can be more objectively predicted preoperatively especially in the older patient, by the Mallampati score which assesses the size of the tongue in relation to mandibular space [6,7]. This is however not possible with the neonate as it requires a cooperative patient.

The most important step in anaesthetic management of cervical teratoma is the provision of safe and secure airway to avoid hypoxia [3,4,8]. These call for careful airway assessment and plan for laryngoscopy and intubation using appropriate induction techniques and airway equipment. Inhalation induction with halothane, spontaneous ventilation and use of straight blade laryngoscope proved to be reliable in securing the airways in both cases reported. This was however not without difficulty as shown by the repeated attempts at intubation. American Society of Anesthesiologists defines the difficult airway as the situation in which the conventionally trained anesthetist experiences difficult with mask ventilation, difficulty with tracheal intubation or both [5,8].

Most anesthetic mishaps result from hypoxia as a result of airway problems [9]. The incidence of failed Intubation is rare (0.05 - 0.35%), while the incidence of failed intubation with inability to perform mask ventilation is rarer (0.01 - 0.03%) in all surgical patients [9,10]. The incidence may be higher among pediatric age group due to their peculiar airway anatomy and cardio-respiratory physiology. Kenan and Boyan [11] reported that failure to provide adequate ventilation was responsible for most cardiac arrest in the perioperative period while the ASA Close-claim study [9] reported significant number of liability claims were due to adverse respiratory events mostly resulting from inadequate ventilation, difficult intubation, and esophageal intubation.

Technique of induction of anaesthesia is an important factor in successful management of airway in neonates. Deep inhalational induction with halothane is known to provide adequate relaxation for intubation while still maintaining spontaneous respiration. This has helped to overcome the anticipated difficult airway such that even when there was failed attempt at intubation the neonate could still breathe spontaneously thereby avoiding undue hypoxia. The straight bladed (Magill) laryngoscope is suitable for laryngoscopy in neonates and infants below the age of six month because of the peculiarity of

the epiglottis which is U-shaped, floppy and disposed at an angle of 45 degrees [12].

Various anaesthetic techniques are available to overcome difficult airway which include inhalational induction, awake intubation using conventional laryngoscope or fibreoptic bronchoscope, tracheostomy under local anaesthesia, retrograde wire intubation, laryngeal mask airway and tracheal-esophageal combitube [12]. Every anaesthetist should be skillful in managing difficult airways and avoid falling into the dangerous situation of "cannot intubate and cannot ventilate" which rapidly result in hypoxic cardiac arrest. Failed intubation drill must be memorized and adopted by every anaesthetist in case of failed intubation [8].

Conclusion

Careful preoperative airway assessment and adequate planning for ventilation and intubation using appropriate induction techniques and airway equipment are the keys to successful management of difficult airways in neonates with cervical teratoma with airway obstruction.

References

1. Bilgin F, Cekmen N, Ugur Y, Kurt E, Gungor S, et al. (2009) Congenital Cervical Teratoma: Anaesthetic Management (The EXIT Procedure). Indian J Anaesth 53: 678-682.
2. Tonni G, Centini G, Inaudi P, Rosignoli L, Ginanneschi C, et al. (2010) Prenatal diagnosis of severe epignathus in a twin: case report and review of the literature. Cleft Palate Craniofac J 47: 421-425.
3. Bergé SJ, von Lindern JJ, Appel T, Braumann B, Niederhagen B (2004) Diagnosis and management of cervical teratomas. Br J Oral Maxillofac Surg 42: 41-45.
4. Jordan RB, Gauderer MW (1988) Cervical teratomas: an analy¬sis. Literature review and proposed classification. J Pediatr Surg 23: 583-591.
5. David J S, Thomas J G. Airway management: in Miller Textbook of Anaesthesia, 5th edition 2002, pages 2100-2104.
6. Eguma S. A, Ogboli EO, Lawal II (2000) Difficult intubation: causes, Predictive test and management. Nigerian Journal of Surgical Research 2: 33-37.
7. Nwasor EO, Lukong CS (2003) Difficult intubation in an infant with cervical mass - a case report. African Journal of Anaesthesia and Intensive care 4: 25-27.
8. Mary C Robert W M (2003) Management of difficult paediatric airway. Brit J of Anaesth CEPD 3: l67-170.
9. Caplan RA, Posner KL,Ward RJ, Cheney FW (1990) adverse respiratory event in anesthesia: a closed claim analysis. Anesthesiol 72: 828-832.
10. Cobley M, Vaughan RS (1992) Recognition and management of difficult airway problems. Brit J of Anaesth 68: 90-97.
11. Keenan R L, Boyan CP (1985) Cardiac arrest due to anesthesia. A study of incidences and causes. JAMA 253: 2373-2377.
12. Glen PM, David TW (1999) Airway management: content of difficult intubation cart. Can J of Anaesth 46: 190-191.