Anaesthetic challenges in a patient presenting with huge neck teratoma

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A B S T R A C T
Paediatric airway management is a great challenge even for an experienced anaesthesiologist. Difficult airway in huge cervical teratoma further exaggerates the complexity. This case report is intended at describing the intubation difficulties that were confronted during the airway management of a three year old girl presenting with huge neck teratoma and respiratory distress. This patient was successfully intubated with uncuffed endotracheal tubes in second attempt under inhalational anaesthesia with halothane and spontaneous ventilation. This case exemplifies the importance of careful preoperative workup of an anticipated difficult airway in paediatric patients with neck swelling to minimize any perioperative complications.

Key words: Difficult intubation, paediatric airway, teratoma

INTRODUCTION
Teratoma is a soft tissue tumour with an incidence of one in 4000 live births.[1] Cervical teratoma accounts for only 1.5-5.5% of these cases.[2] Airway management of cervical teratoma is a great challenge even for an experienced anaesthesiologist. We are reporting a case of huge neck teratoma presenting with respiratory distress/strider and the intubation difficulties that were confronted during the airway management.

CASE REPORT
A 3 year old girl, weighing 12 kg, presented to the out-patient department with a massive neck mass enlarging gradually over the past two year. She tends to fall forwards in upright position and had difficulty in breathing/strider in lying down posture. The base of the mass extended vertically from lower border of mandible up to clavicle inferiorly (approx. 18 × 12 cm in size) and on both sides approaching posterior triangle of neck (more towards left side). The mass was firm in consistency, non-translucent, non-tender with a shallow ulcer (2 × 2 cm size) at most dependent part [Figure 1]. Systemic examination/routine haematology was within normal limits. Skiagram and CECT of the neck/chest showed a soft tissue mass involving major vessels of neck with extra-thoracic extension up to the lower end of sternum and marked trachea deviation towards the right side (C4-T2 vertebral level) [Figure 2]. Cytology (FNAC) report was suggestive of teratoma. At the preoperative visit, her airway examination revealed Mallampatti grade III with restricted neck movements. She was graded as ASA II according to American Society of Anaesthesiologists risk classification.

As a part of pre-anaesthetic preparation, availability of adequate blood and difficult airway cart was ensured in the operation theatre. Patient was pre-medicated with glycopyrrolate 0.01 mg/kg IV, ondansetron 0.15 mg/kg IV. After pre-oxygenation, inhalational anaesthesia was induced with incremental doses of halothane (0.5% increment after every five breaths up to 3.0%) with 100% oxygen until intubating conditions were achieved. A cushion was placed under the shoulder to provide better laryngoscopic view. Two experienced anaesthesiologist participated in the procedure, one for holding the tumour mass and other for intubation. In the first attempt using Macintosh blade, intubation failed due to marked laryngeal deviation towards the right side (Cormack-Lehane grade 3). In the second attempt, using Magill blade, a 4.5 mm uncuffed endotracheal tube slid over the vocal cords but after that resistance was encountered. Immediately, a smaller size (4 mm) endotracheal tube was exchanged over the suction catheter (8.0 mm size) and trachea was now intubated, with confirmed bilateral...
air entry. Neuromuscular blockade was then facilitated with rocuronium (0.6 mg/kg IV) and a triple lumen central venous cannulation was done into right subclavian vein. Surgery was allowed to commence and anaesthesia was maintained with halothane, nitrous oxide/oxygen combination (60%/40%) and rocuronium (0.1 mg/kg IV) throughout surgery. The vitals remained stable throughout the operation and no major blood loss was there. A soft tissue mass weighing 2.75 Kg was excised during this procedure that lasted for about 2 hrs. At the end of surgery, after confirming adequate breathing efforts, neuromuscular block was reversed with neostigmine (0.05 mg/kg IV), glycopyrrolate (0.01 mg/kg IV). The patient was extubated and transferred to PACU. The patient remained stable throughout the postoperative period with no further complications.

DISCUSSION

Teratoma, a rare soft tissue tumour, arises from pluripotent stem cells comprising of tissues from all the three germ cell layers having varying degree of differentiation. Although it follows a benign course, tumour location/size, proximity to vital organs and late presentation predisposes to significant increase in mortality and morbidity of untreated patients.\(^\text{[3]}\) Cervical teratoma usually emerges during the neonatal period and is associated with varying degree of airway obstruction in parallel to the age of presentation. Gundry et al. observed a mortality rate of 80% in non-operated cases during the neonatal period compared to 15% mortality in patients who underwent early surgical excision of cervical teratoma.\(^\text{[4]}\) Uniqueness of our case was its late presentation (three year) until the tumour grew into a massive size neck swelling. The anaesthetic concern in this patient included limited neck movement, marked tracheal deviation and tumour proximity to major neck vessels. The paediatric age group (limited functional reserve/higher oxygen requirement) further increased the risk of hypoxia.\(^\text{[5]}\) Airway management in such cases require special considerations (careful airway assessment, availability of difficult airway cart, presence of experienced anaesthesiologists and proper anaesthetic plan), as a compromised airway can have catastrophic consequences. In this case, we could successfully secure the airway by utilizing inhalational induction with halothane under spontaneous ventilation and use of straight blade laryngoscope without any complications. Furthermore, to avoid any episodes of hypoxia, the patient was oxygenated by face mask in between failed attempts of intubation. Nevertheless, we do encountered difficulty, as shown by repeated attempts at intubation and need for smaller endotracheal tube to overcome resistance due to tracheal deviation. We must acknowledge that flexible fibre-optic bronchoscopy guided intubation should have been the first option for managing the anticipated difficult airway, unfortunately not available in our set up. Other options like awake intubation, trachlight, retrograde intubation and tracheostomy were not feasible in this case because the tumour was obliterating anterior aspect of neck. Furthermore, paediatric awake intubation is potentially traumatic, may cause stress-induced haemodynamic fluctuations and not applicable when laryngeal structures are not visible.\(^\text{[6]}\) Our other major concern was the risk of intraoperative bleed in-lieu of massive tumour size and involvement of major neck vessels. As the tumour was well encapsulated we did not observed any major blood loss in this case.

Postoperatively, airway complications like laryngeal oedema, bronchospasm and tracheomalacia are frequent in such patients. Long term tracheal/lung compression can also lead to postoperative larynx/lung hypoplasia and subglottic stenosis. If there is a risk of tracheomalacia, ideal approach

\(\text{Figures 1 and 2:}
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should be tracheal extubation over a bronchoscope to detect any tracheal collapse. This technique can be further improvised by exchanging LMA for tracheal tube and allowing the patient to resume spontaneous ventilation. Now a bronchoscope should be advanced through the LMA to look for any tracheal collapse. This offers an additional advantage in visualization of laryngeal anatomy and function. In circumstances of unavailability of paediatric fibroscope, we chose to extubate the patient under following grounds: Preoperatively, she had respiratory difficulty only on lying down posture, the tumour was well encapsulated/not involving mediastenum and previous documentation of successful use of non invasive positive pressure ventilation (NPPV) for postoperative ventilatory support in cases of even severe tracheomalacia. To avoid any respiratory complication, we extubated the patient under deeper plane of anaesthesia, and she was kept on close observation for any requirement of NPPV/reintubation in PACU.

CONCLUSION

Cervical teratoma is a life threatening condition requiring early management of airway obstruction. This case emphasizes the need for careful preoperative workup of anticipated difficult airway in paediatric patients with neck swelling to minimize any perioperative complications.

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How to cite this article: Jain G, Varshney R. Anaesthetic challenges in a patient presenting with huge neck teratoma. Saudi J Anaesth 2013;7:210-2.

Source of Support: Nil, Conflict of Interest: None declared.