Recannulation of a stenosed old tracheostomy wound in vocal-cord palsy: Anaesthetic management

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ABSTRACT

Tracheostomy still remains a life-saving procedure to secure a patent airway in emergency situations. Anaesthetic management of tracheostomy in paediatric patients with bilateral vocal cord immobility and acute respiratory distress in emergency has always been a great challenge to the anaesthesiologists. Administering general anaesthesia in a child for recannulation of tracheostomy in emergency is far more challenging. We report a case of a 4-year-old male child in whom tracheostomy tube was accidentally removed 2 months back and the wound got stenosed gradually leading to acute respiratory distress. Emergency dilatation and recannulation of tracheostomy wound was planned under general anaesthesia and the case was managed successfully.

Key words: Recannulation, tracheostomy, vocal cord palsy

INTRODUCTION

Many cases of bilateral vocal cord palsy (VCP) with dyspnoea and stridor require glottic dilatation \[1\] or tracheostomy. Usually, tracheostomy is performed under local anaesthesia, but administering general anaesthesia poses a challenge to anaesthesiologists, especially in a child. A prompt planning, vigilant anaesthetic management and a smooth co-ordination between anaesthetic and surgical team in a paediatric case under emergency situation is a message to be conveyed here.

Induction of general anaesthesia in a child with both the vocal cords adducted and partially occluded tracheal stoma leading to acute respiratory distress could cause a catastrophe at any moment, if not managed vigilantly. This fact is highlighted in the present case.

CASE REPORT

A 4-year-old male child of weight 12 kg, a known case of bilateral VCP who had pulled out the tracheostomy tube accidentally 2 months before, presented in acute respiratory distress with partially occluded stoma. The child was taken to operation theatre as an emergency for recannulation. He was conscious, oriented, but irritable, and was nil by mouth for last 10 hours. He showed fatigue and indrawing of subcostal muscles along with decrease in bilateral air entry and mild bronchospasm, but was fortunately maintaining an oxygen saturation of 90–92%, which could increase to 99% on oxygenation using Jackson-Rees circuit for 5 min, although jet ventilation device was kept arranged as a backup plan in case of failure of bag mask ventilation after anaesthesia induction. He had a heart rate of 140/min and blood pressure of 100/60 mmHg. After taking the written informed consent, premedication was given with Glycopyrrolate 0.01 mg/kg and Midazolam 0.1 mg/kg intravenously, while maintaining jet insufflation of oxygen through the tracheostoma with the help of a cannula. Hydrocortisone 50 mg and Dexamethasone 2 mg were administered prophylactically through intravenous route. Induction of anaesthesia was done with Ketamine 0.5 mg/kg and Propofol 2 mg/kg, both

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intravenously. Visible chest rise was assured using a bag mask device in post-induction period by sealing the stoma with a wedged gauze piece. The endotracheal intubation was facilitated by succinylcholine (1.5 mg/kg) induced paralysis of vocal cords, using uncuffed endotracheal tube of size 4.5 which was advanced distal to the stoma. After confirmation of bilateral lung ventilation, dilatation and recannulation of the stenosed tracheostomy wound were done using a metallic tracheostomy tube of size 4.0 with simultaneous withdrawal of oral endotracheal tube [Figure 1]. Ventilation was then switched over to another endotracheal tube of size 3.5 through the outer tracheostomy tube as per the availability in the setting [Figure 2], although airway management using a Portex tracheostomy tube is ideal.

Anaesthesia was maintained on O2:N2O (50%:50%) with Halothane 0.2–0.4% and Atracurium 0.5 mg/kg. The neuromuscular blockade was reversed with Neostigmine 0.05 mg/kg and Glycopyrrolate 0.01 mg/kg. Then the child was ventilated through the tracheostomy till the complete recovery of spontaneous respiration and endotracheal tube from the tracheostomy site was removed and the course remained uneventful [Figure 3].

**DISCUSSION**

In children, causes of bilateral vocal cord immobility include central neurologic abnormalities such as Arnold–Chiari malformation with meningomyelocele and hydrocephalus being most common,[2] infarct, craniotomy and asphyxia in some cases,[3] and idiopathic causes, the second most common. Gacek hypothesised that fewer abductor fibres exist; therefore, injury to the nerve is more likely to cause abductor dysfunction.[4] Iatrogenic causes of VCP are mediastinal procedure, cervical procedures, prolonged intubation[5] and birthing trauma.

Anaesthetic management for re-tracheostomy in emergency situation, especially in paediatric age group, is quite challenging due to rapid loss of airway control along with superadded anatomical and physiological differences from adults. Here, we have managed a paediatric case with an old and partially stenosed tracheostomy with acute respiratory distress. In this case, managing airway was quite difficult as the inspired air would leak through a hole in lower trachea. So, we assured the ventilation post-induction before administering neuromuscular blocker by sealing the stoma with a wedged gauze piece and also advanced the tube distal to it.
In our case, nitrous oxide was used only for the period of actual instrumentation, once an oxygen saturation of 100% was achieved after preoxygenation followed by intubation. Nitrous oxide, an inhalational agent, has been preferred over any other intravenous analgesic here to avoid post-operative respiratory depression and also as it could be exhaled through the lungs after controlled ventilation with 100% O₂.

Induction of general anaesthesia in a paediatric case of bilateral VCP with partially occluded tracheal stoma and placing tracheostomy tube after dilatation of the stoma were the two critical moments in the management of this case, which proved to be highly challenging.

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