# Case Report

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# Gasping infant for emergency neck exploration, anaesthesiologist's nightmare!

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#### **ABSTRACT**

Children are not small adults. They have certain anatomical & physiological differences as compared to adults. Paediatric patients have limited body reserve and so they deteriorate very fast. Anaesthetising paediatric patient requires good clinical judgment and thorough knowledge of paediatric anatomy and physiology. Anaesthetising an infant who has respiratory distress preoperatively increases risk several folds. Also the cause of respiratory distress is vital and that can have an important anaesthetic implications. Here we report a case of a gasping infant operated for emergency neck exploration under anaesthesia, where the cause of respiratory distress was unknown, making the case further interesting and challenging.

Keywords: Gasping infant, Unknown cause, Emergency neck exploration, Anaesthesiologist's challenges

## INTRODUCTION

Paediatric anaesthesia differs from adult anaesthesia because children are not small adults. They have certain anatomical & physiological differences as compared to adults. Children have limited respiratory reserve, higher oxygen consumption, rate dependent cardiac output and so they decompensate very fast. Anaesthetising an infant who has respiratory distress preoperatively poses real challenge for an anaesthesiologist. We report a case of an infant who presented to us in gasping state, with cause of distress not known, brought to operation theatre for emergency neck exploration under anaesthesia.

### **CASE REPORT**

A six months old, female child, weighing 5. 5kg was rushed to operation theatre in gasping state, for emergency neck exploration under anaesthesia. The child had oral injury with an arm of spectacle while the child was playing, about three days back. This was the only history which was available. Because it was a dire emergency situation, detailed history taking, preanaesthesia check up was not possible. We could not

wait for any radiological or pathological investigations eighter. So exact diagnosis could not be established and the child was taken to operation theatre. In operation theatre, child's general condition was poor. Child was drowsy & was gasping. O/E Pulse was regular 170/per minute, B. P. was 110/50, Spo2 was 85% with O2 under hood. The child had nasal flaring with an intercostal retraction. On auscultation, there was a bilateral inspiratory stridor, cvs was normal except tachycardia.

As the child was deteriorating very fast we had to proceed to intubation quickly. We chose sevoflurane as induction agent for obvious reasons that child's spontaneous respiration will be maintained and laryngoscopy, intubation will be smooth and atraumatic. Laryngoscopy was gently done anaesthesiologist, who noticed posterior pharyngeal wall bulge. Also airway oedema was noticed. Utmost care was taken at the time of laryngoscopy and intubation so as to avoid trauma to posterior pharyngeal wall bulge or to any other oral structure. Difficult airway cart was kept ready to deal with 'cannot ventilate, cannot intubate situation' containing laryngeal mask airways of size 1&1.5, smaller size endotracheal tubes, curved as well as straight blade laryngoscopes and tracheostomy set. Child accepted no. 3 uncuffed endotracheal tube. Throat was thoroughly packed. Maintainance of anaesthesia was on oxygen, nitrous oxide and sevoflurane using Jackson Rees circuit. Atracurium was used to facilitate IPPV. Analgesia was achieved with incremental doses of fentanyl. Inj. Dexamethasone (2mg) was given to reduce airway oedema. Intraoperative finding was retropharyngeal abscess which was aspirated per orally by the surgeon. Abscess had spread down upto superior mediastinum. Surgeon managed to drain the superior mediastinal abscess through the neck incision.

Intraoperatively, no. 5Fr. central line was inserted in right subclavian vein, under aseptic conditions in view of the diagnosis. CVP was 7-8 cm of water. At the end of the surgery, child had spontaneous respiratory attempts & was reversed with neostigmine (0. 2mg) & glycopyrrolate (0.04mg). Child was extubated after good respiratory attempts.

Postoperatively, child had comfortable breathing. Child was shifted to paediatric intensive care unit. Postoperatively intravenous fluids were given to maintain normal central venous pressure (CVP). Intravenous antibiotics, dexamethasone and bronchodilator nebulisation were continued in postoperative period. Recovery was uneventful and child was discharged on  $10^{th}$  postoperative day.

## **DISCUSSION**

Children frequently require admission to hospital for respiratory problems. In fact, respiratory problems account for nearly about 40% of the hospital admissions in children.<sup>3</sup> There are number of causes leading to acute respiratory distress in children. The causes can be medical or surgical.<sup>4</sup> Causes of respiratory distress differ according to the age group.<sup>4</sup> Majority of these paediatric patients are managed medically & some of them require surgical intervention. Those children requiring surgical intervention are also stabilized preoperatively so as to minimize intraoperative and postoperative complications, except children who need life saving emergency surgery. Such dire emergency situations pose great challenge for surgeon as well as anaesthesiologist.

Our case was challenging from anaesthesia point of view as this child had multifactorial problems. Firstly, child was brought to operation theatre in gasping state so detailed preanaesthetic checkup was not possible. Because of emergent nature of this case, preoperative blood investigations, CT scan or other radiological workup was not done, so exact diagnosis was not clear prior to induction of anaesthesia. In such cases of penetrating oral trauma, common cause of respiratory distress is trauma to important oral structures which may get involved, depending upon sharpness of the object and force with which it has penetrated. There can be injury to palate, tongue, tonsillar pillars causing oedema.

Posterior pharyngeal wall laceration can also occur. Also deep neck infections are not uncommon in penetrating oral trauma. All these can have important anaesthetic implications.

We anticipated difficult airway but patient being paediatric and it was a dire emergency situation, preoperative airway assessment was impossible. In such cases one has to be prepared for catastrophic situation. Anaesthetising an infant with compromised airway is very challenging and in our case the child was uninvestigated and deteriorating rapidly which increases the risk manyfolds.

Neck exploration under anaesthesia revealed retropharyngeal abscess which is again a notorious diagnosis. Retropharyngeal abscess is infection of retropharyngeal space. The retropharyngeal space is located posterior to the pharynx. The anterior border is the visceral fascia, the alar fascia is located posteriorly, and the carotid sheaths and parapharyngeal spaces laterally. The retropharyngeal space extends upwards to the skull base and downwards to the mediastinum upto the level of the tracheal bifurcation, so retropharyngeal abscess can spread directly to adjacent important structures.<sup>7</sup> Complications of retropharyngeal abscesses are secondary to mass effect, rupture of the abscess, or spread of infection.<sup>8</sup> The most urgent complication involves the abscess expanding against the pharynx or trachea, causing airway compression. Rupture of the abscess can cause aspiration of pus, resulting in asphyxiation or pneumonia. The infection can spread, resulting in inflammation and destruction of adjacent tissues. Spread of the infection to the mediastinum can result in mediastinitis, purulent pericarditis and tamponade, pyopneumothorax, pleuritis, empyema, or bronchial erosion. Spread of the infection laterally can involve the carotid sheath and cause jugular vein thrombosis or carotid artery rupture. Posterior spread of infection can result in osteomyelitis and erosion of the spinal column, causing vertebral subluxation or acute transverse myelopathy. <sup>10</sup> The infection itself can evolve into necrotizing fasciitis which can lead to even sepsis and death. The patient is often dehydrated, that results in electrolyte imbalance and metabolic derangements due to poor oral intake. 11 All these can have important anaesthetic implications. Apart from all these, difficulty in airway management is the major concern for an anaesthesiologist. Tracheal intubation is challenging due to oedema, distorted airway anatomy, and decreased mouth opening. In early stages, induction of general anaesthesia reduces trismus, however, in later stages when the oedema is massive, induction may precipitate a 'cannot ventilate, cannot intubate' situation. 12 The vocal cords may be difficult to visualise due to swollen pharyngeal wall, airway oedema and laryngeal displacement. In such cases difficult airway cart has to be ready to avoid hypoxia at any point during anaesthetic induction. In our case we had backup plan ready and kept appropriate size of masks, oral airways, laryngeal mask airways no. 1&1.5, smaller size endotracheal tubes (no. 2, 2.5, 3), straight as well as curved laryngoscope blades and tracheostomy tubes. Another concern for anaesthesiologist is rupture of abscess during larygoscopy and intubation. This can lead to aspiration of pus so laryngoscopy should be gentle and a working suction machine has to be ready. Thorough throat packing is vital especially, in paediatric patients where uncuffed tube is used.

Our patient was stable intraoperatively. In this patient retropharyngeal abscess had spread to superior mediastinum but child was lucky not to have further complications of mediastinitis. Central vein was cannulated intraoperatively in view of diagnosis of retropharyngeal abscess. These patients are often dehydrated and are at risk of developing septicemia so intraoperative and postoperative central venous pressure (CVP) monitoring is mandatory. Postoperative steroids are vital as airway oedema may increase in immediate postoperative period because of surgical handling. Postoperative good antibiotic cover is also essential.<sup>14</sup>

In summary, anaesthetizing a paediartic patient with respiratory distress requires good clinical knowledge of paediatric anatomy and physiology, quick decisions, anticipation of complications and preparedness to deal with the catastrophe.

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