

# Perioperative Anaesthesia Management of a Paediatric Patient with a Giant Facial Tumour: A Case Report

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## ABSTRACT

General anaesthesia administration in paediatric patients is a challenging task to begin with. It can be further complicated when a patient presents with large facial tumour distorting the anatomical structures, reducing mouth opening (two-finger breadth), and a Mallampati score of 4. We report the anaesthetic management during surgery of a patient with a large left-sided undifferentiated malignant facial tumour in a tertiary care hospital. The patient had anticipated difficult airway. Pre-oxygenation and video laryngoscopy to insert cuffed endotracheal tube (ETT) was used for airway maintenance. Fentanyl, ketamine, and propofol were used for induction, while dexmedetomidine was used to maintain anaesthesia. Meticulous intraoperative monitoring was done and fluid balance was ensured. A multi-disciplinary team approach was used for successful anaesthesia management during prolonged surgery. The postoperative outcome was good.

**Key Words:** *General anaesthesia, Difficult airway, Facial tumour, Mallampati score.*

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## INTRODUCTION

Administration of general anaesthesia in paediatric patients with difficult airways can pose a significant challenge to anaesthesiologists. The management of such cases requires a comprehensive understanding of the underlying pathology and its resultant anatomical distortion.

Due to their size, location, and associated anatomical abnormalities, facial tumours may pose unique challenges during the airway management. The Mallampati score is a useful clinical tool to predict difficult intubation.<sup>1</sup> A higher Mallampati score, i.e. a score of four, means that only the hard palate can be seen, and the anaesthesiologist might find it challenging to secure the airway. Successful management of such cases requires meticulous planning and a multi-disciplinary team approach.<sup>2</sup> We report a case of a six-year-old patient with a large malignant facial soft tissue tumour, a Mallampati score of four, and anticipated difficult intubation. This case report describes the anaesthetic technique, the challenges, and the overall outcome of a high-risk paediatric patient with a difficult airway.

## CASE REPORT

A six-year-old child, weighing 15 kg, with no known comorbid conditions, presented at plastic surgery clinic with a huge facial swelling for six to eight months. The swelling was not associated with symptoms of airway obstruction, dyspnoea, orthopnoea, etc. On physical examination, the patient was conscious, alert, and oriented with time, place, and person. He was pale, but there were no signs of jaundice, oedema, cyanosis, or clubbing. He was afebrile with a pulse rate of 98 beats per minute and blood pressure of 119/60 mm Hg. On local examination, there was a large 10 x 10 cm exophytic lesion extending from the left side of face towards the inferior orbital rim, medially to the nose, inferiorly to the chin, and laterally almost 4-5 cm from the tragus (Figure 1 and 2). The CT scan of head and neck reported a large exophytic lobulated soft tissue lesion arising from the left cheek, causing thinning of maxillary sinus with multiple bilateral lymph nodes enlargement. The size of the lesion reported on CT scan was 10.6 x 7.1 x 5.3 cm. On systemic examination, the patient had no signs of respiratory distress, stridor, etc. His facial swelling was not extending orally and was not obstructing the airway. The rest of the systemic examination was unremarkable.

Composite resection of left facial lesion and neck dissection was planned under general anaesthesia. Patient's family was counselled in detail regarding the anaesthetic and surgical risks and written informed consent was obtained. On preoperative anaesthesia assessment, Mallampati class was 4, mouth opening was restricted (about two-finger breadth). Neck and jaw movements were reduced. These findings were most likely due to the large facial swelling. The relevant preoperative laboratory investigations were normal. Patient's blood grouping and

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cross-matching was done and 2 units of each red cells, fresh frozen plasma (FFPs), and platelets were arranged preoperatively. Postoperative extubation plan was discussed with the surgeon. Since there was no intra-oral extension, so routine extubation was planned in the operating room and no arrangements for postoperative ventilation were deemed necessary.



**Figure 1: Preoperative front view of the giant facial tumour.**



**Figure 2: Preoperative lateral view of the giant facial tumour.**



**Figure 3: Postoperative front view of the giant facial tumour removed.**

In the operating room, after applying routine anaesthesia monitoring including capnography, the patient was preoxygenated with three liters of oxygen *via* nasal cannula. Preoxygenation with a facemask could not be performed due to the asymmetry of the face secondary to large facial lesion. For induction of anaesthesia, 20 µg of fentanyl, 15 mg ketamine, and 30 mg

propofol were administered intravenously in titrated doses to achieve apnoea. Neuromuscular blocking agent was not administered at this stage due to anticipation of difficult airway. As the patient became apnoeic, laryngoscopy was performed *via* C-MAC video laryngoscope. The facial mass was displaced laterally by the surgeon, away from the mouth in order to aid intubation. Cormack Lehane grade was 1. Cis-atracurium, 3 mg, was subsequently administered. An oral cuffed endotracheal tube of 5 mm was fixed at 15 cm and secured. An arterial cannula was then placed in the left radial artery anticipating extremes of blood pressure and need for blood sampling intraoperatively as significant blood loss was expected.

The surgery was started after induction of general anaesthesia and administration of prophylactic antibiotic (Figure 3).

For maintenance of anaesthesia, Isoflurane 0.8 to 1.0%, was administered with a mixture of oxygen and nitrous oxide (FiO<sub>2</sub>: 40%) to maintain MAC between 0.8-1.0. Dexmedetomidine infusion was started at 0.2 – 0.4 µg/kg/hour to supplement anaesthesia and analgesia. Intravenous Morphine (3 mg) and Acetaminophen (220 mg) were also infused intraoperatively. The procedure continued for five hours during which his vital signs remained within 20% deviation from baseline. Total blood loss was approximately 300 ml. The patient was transfused 300 ml packed cell volume and 1500 ml crystalloids in total. He maintained urine output around 0.5-1 ml/kg/hour intraoperatively. Towards the end of surgery, significant generalised oral oedema was noticed. The surgeon was of the opinion that it was due to venous engorgement secondary to ligation of blood vessels in the surgical field. After discussion with the surgeon, it was decided to keep the patient ventilated in intensive care unit (ICU) postoperatively keeping in view the risk of postoperative airway oedema and reintubation. The patient was extubated on second postoperative day and was shifted out of ICU the next day. His ICU stay was unremarkable.

The patient was re-explored 6 times after this initial surgery because of graft failure. In the subsequent surgeries, his airway management and extubation was routine and uneventful.

## DISCUSSION

The management of paediatric patients with giant facial tumours presents a daunting challenge to anaesthesiologists and surgical teams, not only intraoperatively but also in terms of postoperative plan. We report a case which highlights that careful planning, expertise, and a tailored/ multi-disciplinary approach are key to achieve good outcomes.

In this case, a paediatric patient with giant facial tumour required surgical intervention for tumour resection. The preoperative evaluation included a comprehensive airway assessment, and a detailed discussion between the surgical and anaesthesia teams to develop a customised plan to mitigate the risks. Although the tumour size and location did not compromise the patient's airway at that point, it required careful consideration of airway management strategies. Bag mask ventilation was not possible in this case because of the extreme asymmetry of

the face which compromised preoxygenation. This was achieved by nasal cannula instead. This is an essential step in managing a difficult airway as it increases the oxygen reserve in the lungs and prolongs the available time to desaturation during the unsuccessful intubation attempts.<sup>3</sup> Neuromuscular blocking agent was avoided before laryngoscopy and was administered immediately after vocal cords were visualised and before insertion of the endotracheal tube. The timing of administration is crucial in difficult airway management because too early neuromuscular blocker administration can result in the loss of airway tone and can mask potential complications like esophageal intubation and accidental extubation.<sup>3,4</sup>

An alternative intubation technique, i.e. video laryngoscopy, was employed in this case to visualise the vocal cords. Literature reveals that video laryngoscopy improves success rate of intubation in anticipated difficult airway such as in patients with limited mouth opening, neck mobility or large facial tumours compared to conventional laryngoscopy.<sup>5</sup>

Dexmedetomidine infusion was used in the maintenance phase in this patient. It provided notable advantage of hemodynamic stability, blunting stress response to surgical stimuli, reducing the incidence and severity of emergence delirium. It allows for quick and precise titration of sedation, enabling early extubation and reducing the duration of postoperative sedation. This is especially beneficial in paediatric patients with risk of postoperative airway obstruction.<sup>6</sup>

Considering the possibility of potential airway compromise post-operatively, the decision to transfer the patient intubated to the ICU was made to avoid the risk of re-intubation caused by airway oedema or obstruction due to intraoperative/postoperative swelling, which has been documented in similar cases.<sup>7</sup> It is worth noting that postoperative airway management plan altered in this patient keeping in view the intraoperative surgical course. Thus, it is emphasised that perioperative plan is a dynamic process and can be modified subsequently to ensure best patient outcome.

In conclusion, the perioperative anaesthesia management of a paediatric patient with a large facial tumour, complicated by a difficult airway, requires a comprehensive and individualised

approach. This case report highlights the importance of careful preoperative planning, the use of multimodal anaesthesia and analgesia, and the importance of interdisciplinary collaboration.

# PATIENT'S CONSENT:

Written, informed consent was obtained from the patient's family.

# AUTHORS' CONTRIBUTION:

DR: Reviewed the manuscript and agreed to be accountable for all aspect of the work.

UAB: Researched literature, conceived the study, and wrote the first draft of the manuscript.

All authors read and approved the final manuscript.

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