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Palatal Obturator Prosthesis: Aid for Securing Airway

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Abstract

Extensive maxilla-palatine defect resulting from maxillectomy is corrected either surgically or with prosthesis. This article describes the use of such prosthesis as an aid for airway management in an anticipated difficult airway patient.

Keywords: Difficult airways, Airway management, Supraglottic airway device, Pediatric anesthesia

Introduction

Radical surgical resection as an oral cancer treatment modality often results in an extensive maxillo-palatine deficit that is repaired using reconstructive modalities. Surgical techniques such as free microvascular flaps, pedicled flaps [1, 2] or leaving a large area capable of healing in spontaneous form to place a removable dental prosthesis (palatal obturators prosthesis/POP) or a permanent dental prosthesis (osteo-integrated implant) [3].

POP has two distinct parts; the obturator, which seals the vacuum created after surgery and a part, which restores the area of the palate, volume of the altered alveolar ridge and the missing teeth to recover the occlusion.

Successful obturation depends on the volume of the defect, tissue retention available around the cavity and development of muscular control [4, 5]. It must be as light as possible as its weight may act as a dislocating force [4]. Dental implants improve the retention, stability and support of prostheses in edentulous patients [6].

Anaesthetic complications that may occur due to palatal obturator include airway obstruction, inability to pass endotracheal tube due to dislodgement of prosthesis, limitation of the space for laryngoscope, traumatic intubation and accidental ingestion during general anaesthesia.

However, the defect in the palate together with the presence of abnormal dentition renders face mask ventilation, laryngoscopy and placement of supraglottic airway (SGA) device difficult.

Case Report

A 15-year-old boy weighing 30 kg was scheduled for Right Eye Dacrocystectomy (RE DCT). Patient had undergone total maxillectomy for Left maxillary sinus Ewings Sarcoma and had received 17 cycles of chemotherapy (Inj. Doxorubicin, Inj. Vincristine and Inj. Cyclophosphamide). Post-surgery patient had a large palatal defect (Figure 1 A) sealed with POP. Hypernasal speech was present. There was no history suggestive of regurgitation.

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Systemic examination was unremarkable. The airway examination showed a large palatal defect with mouth opening of 3 cm with normal extension and flexion. Intravenous cannulation was difficult due to chemotherapy. Patient's blood biochemistry and post chemotherapy 2D echocardiography were within normal limits.

On the morning of surgery, patient was asked to keep the palatal obturator (Figure 1 D) in situ as an aid for SGA device placement. After confirming fasting status patient was taken to the operation theatre. Difficult airway cart was kept ready. In the operating room, routine monitors (electrocardiogram, non-invasive blood pressure, pulse oximeter) were attached to the patient. Inhalational induction was done using sevoflurane with 100% Oxygen (O_2) while maintaining spontaneous respiration. After securing intravenous cannula, Inj. Fentanyl 1 µg /kg (30 µg) and Low dose of Inj. Propofol in titrated dose (40 mg) was given just as an add on for deepening the plane of inhalational induction. Following jaw relaxation, Size 3 AMBU SGA was inserted by guiding over palatal obturator (Figure 1 C3). After confirming its correct position, SGA was secured with silicone gel based water resistant adhesive tape [7]. Anaesthesia was maintained with sevoflurane in 50% O_2/Air with patient breathing spontaneously. Inj Paracetamol 15 mg/kg (450 mg) and Inj. Ketorolac 0.5 mg/kg (15 mg) were given for analgesia. After completion of surgery, SGA was removed once patient was completely awake. POP retained its position throughout the procedure and was removed by the patient in the recovery room.

Discussion

Post maxillectomy patients can have extensive maxillo-palatine defect resulting in problems with speech, mastication, swallowing and aesthetic complications.

Such defects are corrected either surgically or by using a prosthetic device known as obturator. POP consists of an acrylic plate and retention clasps of orthodontic wire, which covers a fistula of the palate. It serves to restore speech, mastication, deglutition and aesthetics [8].

Anaesthetic complications that may occur due to POP include airway obstruction, inability to pass endotracheal tube due to dislodgement of prosthesis, limitation of the space for a laryngoscope, a traumatic intubation and accidental ingestion during general anaesthesia. Akelma et al [9] reported the ingestion of partial

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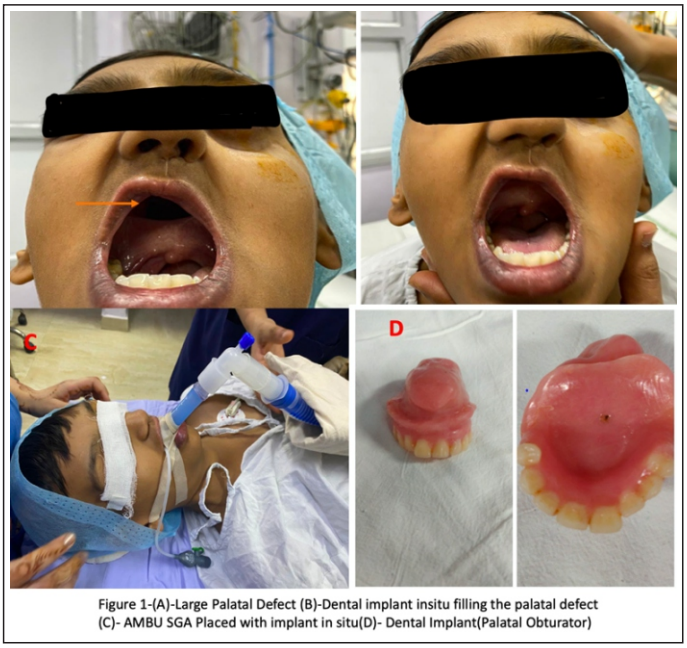

Figure 1-(A)-Large Palatal Defect (B)-Dental implant insitu filling the palatal defect (C)- AMBU SGA Placed with implant in situ(D)- Dental Implant(Palatal Obturator)

denture after general anaesthesia induction and ventilation in a 50-year-old male undergoing surgery for multinodular goitre.

In our patient Bag-Mask sealing and subsequent ventilation would've been inadequate and difficult because of large maxillary defect which provides bony support for the mask. Even if we had used it just for bag-mask ventilation, removal prior to SGA insertion would've been clumsy and cumbersome. Insertion of SGA requires mask portion to be pressed against hard palate as a conduit. With severe deformed oropharynx in the form of absent maxilla and hard palate, placement of SGA might have been difficult. Fixation of Supraglottic airway device will also be difficult because of absence of bony support structure of maxilla.

On the other hand, removing POP may increase the risk of regurgitation, aspiration, difficult bag and mask ventilation, difficult laryngoscopy, difficult placement and retention of SGA device. Our patient had palatal obturator with removable dental implant (Figure 1 B2) that improves the retention, stability and support of prostheses in edentulous patients [6].

Conlon et al [10] studied the effect of leaving dentures in place on bag-mask ventilation at induction of general anaesthesia in edentulous patients and concluded that bag-mask ventilation is easier when their dentures are left in situ during induction of anaesthesia. In our case retention of POP helps us to maintain the normal contour of face. Although the cuff of SGA sits deeper just above the larynx the rest of part of SGA has to be secured in place on a bony promionance. So, contrary to routine practice of removing dentures prior to induction of anaesthesia, it was decided to retain POP during the procedure. This eased bag and mask ventilation as well as insertion of SGA device. We believe that POP prevented the displacement of SGA device and leak around it resulting in successful placement and ventilation, thus avoiding tracheal intubation in anticipated difficult airway.

Highlights

- Palatal obturator prosthesis (POP) help fill the void created post maxillectomy.
- The type of dentures should be enquired and examination during pre-anaesthesia check up
- POP eases bag-mask ventilation.
- Retaining POP helps in insertion and placement of supraglottic airway device.

New Learning

Palatal obturator prosthesis (POP) help fill the anatomical void created post maxillectomy
surgery and aid anaesthesiologists in airway manipulation. They provide structural support to
any artificial airway like SGA, Endotracheal tube or oropharyngeal airways. POPs eases Bag- mask ventilation, insertion and securing SGA devices.

Conclusion

Palatal obturator with removable dental implant has better retention and less chance of displacement, and hence can be successfully used as an aid for SGA placement in an anticipated difficult airway patient undergoing short procedures.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

References

1. Cordeiro PG, Santamaria E. A classification system and algorithm for reconstruction of maxillectomy and midfacial defects. Plast Reconstr Surg. 2000;105:2331–46.
2. Chiapasco M, Biglioli F, Autelitano L, Romeo E, Brusati R. Clinical outcome of dental implants placed in fibula-free flaps used for the reconstruction of maxillo-mandibular defects following ablation for tumors or osteoradionecrosis. Clin Oral Impl Res. 2006;17:220–8.
3. Tirelli G, Rizzo R, Biasotto M, Di Lenarda R, Argenti B, Gatto A. Obturator prostheses following palatal resection: clinical cases. Acta Otorhinolaryngologica itálica. 2010;30:33–9.
4. Bagis B, Aydoğan E, Hasanreisoğlu U. Rehabilitation of a congenital palatal defect with a modified technique: A case report. Cases J. 2008;1:39. [PMC free article] [PubMed] [Google Scholar]
5. Roumanas ED, Nishimura RD, Davis BK, Beumer J., 3rd Clinical evaluation of implants retaining edentulous maxillary obturator prostheses. J Prosthet Dent. 1997;77:184–90.

6. Parel SM, Branemark PI, Jansson T. Osseointegration in maxillofacial prosthetics. Part I: Intraoral applications. J Prosthet Dent. 1986. April;55(4):490–4.

7. Nagarajappa A, Kaur M, Samanta A, Tyagi A. Endotracheal tube fixation: Still a dilemma. Journal of anaesthesiology, clinical pharmacology. 2019 Jul;35(3):400.

8. Keyf F. Obturator prostheses for hemimaxillectomy patients. J Oral Rehabil. 2001;28:821–9.

9. Akelma H, Salik F, Başol Ö, Bilge H, Yıldırım A, Özgün Ş. Ingestion of Partial Denture after General Anesthesia Induction and Ventılation: A Rare Case Report. Case reports in surgery. 2019;2019.

10. Conlon NP, Sullivan RP, Herbison PG, Zacharias M, Buggy DJ. The effect of leaving dentures in place on bag-mask ventilation at induction of general anesthesia. Anesthesia & Analgesia. 2007 Aug 1;105(2):370-3.

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