Immediate and definitive hollow bulb obturator for partial maxillectomy – A case report.

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Abstract

Abstract: For patients with partial or total maxillectomy defects, prosthetic rehabilitation with an obturator prosthesis is the gold standard treatment, offering optimal functional and cosmetic outcomes. The hollow obturator prosthesis reduces the load on the underlying and surrounding tissues. It is fabricated using a simple, cost-effective technique. A wax pattern is generated to replicate the defect area, which is then filled with water, frozen and used as a template. The resulting ice block is sandwiched between two layers of heat-cured acrylic resin, ultimately forming the prosthetic device. After curing, a hole is made to remove the ice block, leaving a hollow space, which is then filled with cold-cure acrylic resin, and a lightweight, uniformly thick prosthesis is created.

Keywords: Hollow bulb obturator, partial maxillectomy, prosthetic rehabilitation.

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Introduction

Maxillectomy is a surgical procedure involving the partial or total resection of the maxilla, typically performed to excise tumors affecting the upper jawbone. While free flap surgery is ideal, prosthetic rehabilitation is considered when surgery is not feasible, especially in older patients or those with poor health or radiation effects. Palatal defects can lead to abnormal communications between the oral cavity and nasal passages (oronasal) or sinuses (oroantral), affecting quality of life. Obturators help to close these defects, improving function and aesthetics. To reduce weight and improve retention, hollow obturators are preferred.[1]

Case Report:

The patient was referred to the Department of Prosthodontics in the Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata, after partial resection of the left maxilla due to adenoid cystic carcinoma. After the resection of the left medial and anterior maxillary walls and alveolus, the right-side teeth were retained. The mandibular arch had full dentition and good oral hygiene. A 33mm mouth opening was there which led to the construction of a temporary hollow bulb obturator. The patient later requested for a feeding plate.

Technique:

Phase 1:

Rigid impression material (Type 1 impression compound) was used for making Preliminary impression of the defect which was followed by taking an impression of the maxillary arch

using irreversible hydrocolloid. (Fig.1)[2] Modeling wax (2-sheet thickness) was applied to the defect, covering the roof and walls, with indexing for accurate denture base fitting. (Fig.2) This wax pattern was then packed and cured using heat cure acrylic resin.

The cured bulb was then retrieved after deflasking and a lid was made with cold cure acrylic resin and seated over the bulb and extended over the palatal surface for a complete and hermetic seal. Following these the finishing and polishing procedures were completed utilizing standard techniques and protocols. (Fig.3)

The prosthesis was seated on the master cast for fit verification. A denture base was made, jaw relations recorded, and teeth arranged. Wrought wire clasps (I and Adam's) were secured. Try-in followed. (Fig.4) After minor adjustments, heat-cure acrylic resin was used, and the bulb was attached to the base plate with auto-polymerizing resin. Final adjustments, finishing, and polishing were completed, then the obturator was placed. (Fig.5)

Proper instructions for oral care and prosthesis care were given to the patient and recalled for post insertion checkup after 24 hours. Patient was given subsequent appointments for periodic assessment and adjustment of the obturator was done at the time he was undergoing radiation therapy. After the cessation of radiotherapy, definitive prosthesis was advised.

Phase 2:
Fabrication of Definitive Obturator Prosthesis: The design resembles a Kennedy's Class II removable partial denture with a bilateral tripodal framework. The tooth near the defect and the posterior molar on the opposite side are the primary support. Double rests were used on adjacent posterior teeth, and guide planes were placed on the distal surfaces of the anterior tooth and last molar. Retention components were positioned on the buccal and palatal surfaces of abutments, with the abutment near the defect utilizing a cast circumferential or I-bar clasp for stability. A balanced occlusion with smaller anterior teeth is preferred.[3]

Discussion

Patients undergoing hemi -maxillectomy often develop acquired palatal defects, resulting in compromised speech, dysphagia and impaired mastication. These defects can significantly impact the quality of life and may contribute to emotional distress and depression. Obturators aim to address these issues by providing a physical barrier between the oral and sino-nasal cavities,thereby restoring oral function and improving patient outcomes. A pressure-resistant seal restores functionality by fitting the obturator bulb against the mucosal lining or skin graft. Wu and Schaaf found that hollow obturators, based on Aramany's classification, reduce weight by 6.55% to 33.06%, improving comfort and efficiency while minimizing stress on supporting tissues.[9]

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FIGURES

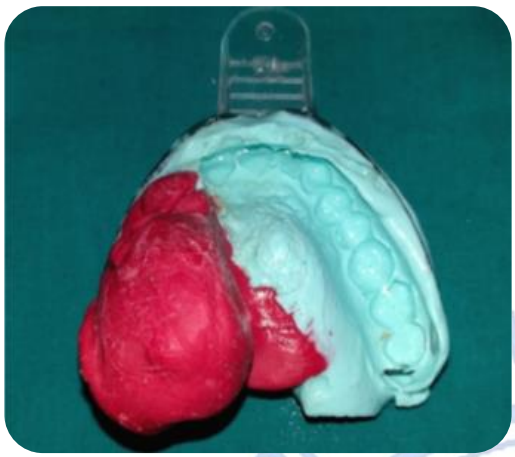

Figure 1

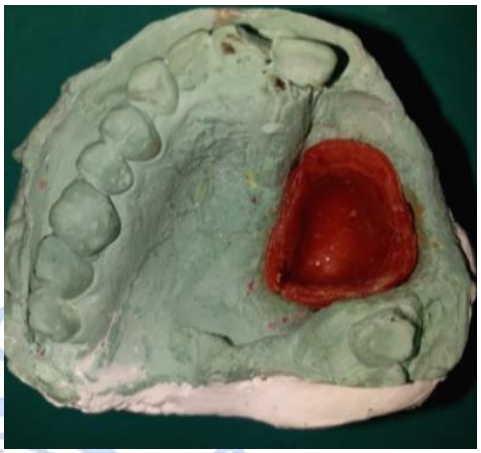

Figure 2

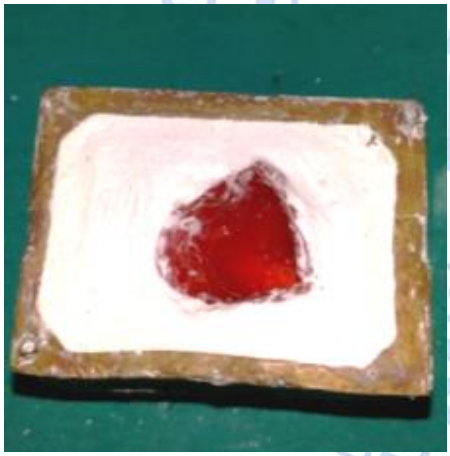

Figure 3

Figure 4

Figure 5

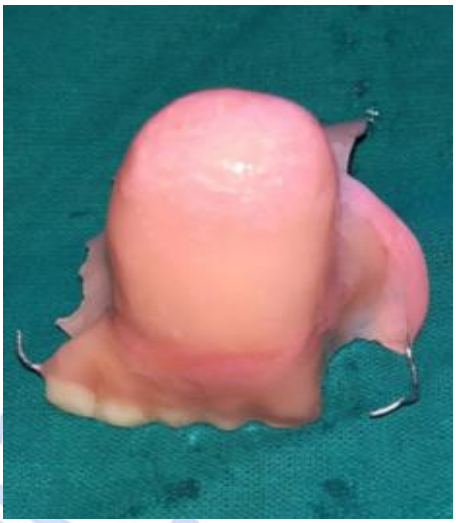

Figure 6

Figure 7

Figure 8