Hollow Bulb Obturator Prosthesis Following Palatal Resection: A Case Report

Bhushan Shinde¹, Ganesh Ranganath Jadhav²,* and Priya Mittal³

¹Private Practitioner, Pune, India; ²Department of Conservative Dentistry and Endodontics, Sinhgad Dental College and Hospital, Pune, India; ³Department of Conservative Dentistry and Endodontics, Centre for Dental Education and Research, All India Institute of Medical Sciences, New Delhi, India

Abstract: Prosthetic intervention with maxillary Obturator prosthesis is necessary to restore the contours of resected palate and to recreate the functional separation of the oral cavity and sinus and nasal cavity. This clinical report describes a technique for fabricating two-stage one piece hollow obturator prosthesis; denture with metal framework and obturator part with heat cured acrylic restoring functions of mastication, speech and esthetic for a patient who had undergone partial maxillectomy for treatment of squamous cell carcinoma.

Keywords: Maxillectomy, Hollow obturator, Metal framework, Two-stage one piece.

1. INTRODUCTION

The morphology of the jaw has a functional and aesthetic role. The palate separates the oral cavity from the nasal fossa and occlusion between the dental arches provides the mandible with the stability, which enables the pharyngeal muscles to initiate the critically important act of swallowing. Aesthetically, the maxillary bone is responsible for the projection of the nose, cheeks and hemi-face. A maxillary-palatal defect may have serious consequences as far as concerns the relationship between form and function [1]. Speech is often unintelligible as a result of marked defects in articulation and nasal resonance resulting from anatomical and structural defects [2]. Malignant tumours of the upper gum and hard palate account for 1-5% of malignant neoplasms of the oral cavity; two thirds of the lesions, which involve these areas are squamous cell carcinomas. Most of these carcinomas are diagnosed late, when they invade the underlying bone [1].

Today, treatment of malignant neoplasms of the hard palate comprises radical surgical resection. This results in an extensive maxillary-palatal deficit and the surgeon, already during clinical pre-surgery evaluation, is faced with a wide range of reconstructive surgical techniques. The defect can be repaired using free microvascularized flaps (osteomusculocutaneous of the internal iliac crest, osteocutaneous flap of the fibula or scapula, fascia, or osteocutaneous radial flap) or pedicled flaps (temporalis muscle flap) [3,4] or by leaving a wide breach which will heal spontaneously, on which it is possible to place a stomatologic prosthesis which may be mobile (palatal obturators) or permanent (osteo-integrated implant) [5].

This paper describes a technique for fabricating two-stage one piece hollow bulb obturator prosthesis; denture with metal framework and obturator part with heat cured acrylic restoring functions of mastication, speech and esthetic for a patient with limited mouth opening [6].

2. CASE REPORT

A 35 years old male patient reported to the Department of Prosthodontics, College of Dental Sciences, Davangere, Karnataka, India, for the fabrication of obturator prosthesis. The patient underwent left maxillectomy procedure to treat squamous cell carcinoma. Patient had also undergone radiotherapy for the same. Personal history revealed the habit of tobacco chewing since last 12-14 years.

The patient’s chief concerns were related to speech, mastication, and esthetics. Extra-oral examination revealed reduced fullness due to loss of support. Intraoral examination revealed a large but well healed defect on the left side of the maxilla along with loss of dentition in the same side corresponding to Armany’s Class II maxillectomy defect (Figure 1). Patient had palpable fibrotic bands of submucous fibrosis in buccal mucosa and severe restricted mouth opening of 1.8 cm.

3. METHOD

Preliminary impression was made with alginate and cast was poured. Framework design was drawn on primary cast after surveying. Mouth preparation carried...
out according to design. Corrective impression was made with putty and light body elastomeric impression material in a custom tray. Sections of putty were inserted into the defect and with retentive grooves on putty, light body impression of surrounding hard & soft tissue was made in custom tray (Figure 2). The impression was boxed and poured in type IV stone.

**Figure 1:** Intraoral view showing defect.

**Figure 2:** Impression of defect area.

Master cast was duplicated to obtain refractory cast. Wax up was done with complete palate major connector, a embrasure clasp encircling maxillary right first & second molar, a continuous clasp on first premolar and canine of left side and indirect retainer on first premolar of right side in the form of mesio-occlusal rest (Figure 3). The framework pattern was cast in base-metal alloy, finished and polished, and evaluated intraorally (Figure 4). Occlusal relationship were secured and mounted in a semi-adjustable articulator. Teeth position and occlusion were checked, and the necessary corrections were made before processing the dentures.

**Figure 3:** Framework wax up on refractory cast.

**Figure 4:** Framework trial intraorally.

Before going for processing of dentures, another cast was duplicated for fabrication of hollow bulb. On the duplicated cast, undesirable undercuts were block-ed and wax up was done only on floor of the defect. Investing, dewaxing, packing and curing were done to obtain sufficient thickness of acrylic. To that defect, putty was incorporated and another curing cycle repeated after packing. A hole was created on medial aspect of bulb to remove the putty (Figure 5). After removal of putty, defect was closed with self-cure acrylic.

**Figure 5:** Hollow acrylic bulb.

Prior to wax up of framework, hollow bulb was placed in the defect of master cast and processing of the dentures were carried out (Figure 6). The obturator portion of the prosthesis was smoothened to reduce
the possibility of trauma to the mucosa and thus improve tolerance of the prosthesis (Figures 7 and 8). The patient was provided with oral hygiene instruction, and follow-up evaluations were performed at 3 and 6 months.

**Figure 6:** Wax up with hollow bulb and teeth in position.

**Figure 7:** Final prosthesis.

**Figure 8:** Postoperative extra-oral view.

4. DISCUSSION

The methods described in this procedure for fabricating this hollow obturator can be applied to complete or partially edentulous situations. Strength has been maximized through heat processing of the acrylic resin while minimizing porosity and increasing durability. The thickness of the section is easily controlled by two stage packing procedure, which allows for a lightweight prosthesis. The seam that seals the section of the obturator is completely covered with heat-processed acrylic resin minimizing the stain and leakage around the area of the seam and increasing the durability and longevity of the prosthesis [7].

The residual maxillary form (ie, amount and contour of the remaining palatal shelf, height of the residual alveolar ridge, configuration and size of the defect, availability of undercuts) affects the degree of obturator movement. The position and periodontal status of abutment teeth are critical factors that contribute to the absorption of stress generated by functional movement of the Obturator prosthesis and play an essential role in retaining and stabilizing the prosthesis [8].

5. CONCLUSION

The use of metal framework improves the retention and stability of prosthesis and complete processing of a closed hollow obturator from the wax try-in stage provides control of the thickness of the obturator section, subsequently reducing the overall weight while providing a seamless, virtually water-tight seal of the prosthesis.

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