

Fabrication of a Hollow Bulb Obturator using Altered Cast Technique: A Case Report

Sariga Kanakaraj¹, K Harsha Kumar², R Ravichandran³, Vivek V Nair³

¹Post Graduate Student, Department of Prosthodontics and Crown and Bridge, Government Dental College, Thiruvananthapuram, Kerala, India, ²Head of Department and Professor, Department of Prosthodontics and Crown and Bridge, Government Dental College, Thiruvananthapuram, Kerala, India, ³Professor, Department of Prosthodontics and Crown and Bridge, Government Dental College, Thiruvananthapuram, Kerala, India

Abstract

Surgical management of head and neck cancers affects the quality of life of the patients during and after treatment. Following a partial or total resection of the palate, the patient may experience difficulty in swallowing, speaking and difficulty in jaw movements. This leads to isolation from the society, and it hampers the well-being of the patient. This article presents a case report of a patient who had undergone partial maxillectomy requiring a definitive obturator.

Key words: Altered cast, Cast retained obturator, Hollow bulb obturator

INTRODUCTION

Rehabilitating patients with maxillofacial defects is one of the most difficult therapies of the stomatognathic system. The main purpose of rehabilitating these defects is to eliminate the disease and to improve the quality of life for these individuals. Following surgical resection, the conventional sequence of treatment includes the placement of a surgical obturator during the intervention.^[1] After 5–10 days, the surgical obturator is removed, and a removable interim obturator is fabricated to facilitate healing of the wound. About 3–6 months later, a definitive obturator is fabricated and inserted at a stage when tissue changes are no longer expected.^[2] This article presents the rehabilitation of a patient with Aramany Class II maxillary defect^[3-5], where definitive prosthetic rehabilitation is carried out with a cast open bulb obturator.

CASE DESCRIPTION AND RESULTS

A 26-year-old female patient with a defect in the posterior left side of the palate reported to the Department

of Prosthodontics in Government Dental College, Thiruvananthapuram. Intraoral examination revealed a maxillary defect on the left side of the palate. The defect extended from the premolar region anteriorly to the posterior aspect of the hard palate posteriorly. Medially, it extended from the mid-palatine region to the buccal mucosa laterally. The patient had partially dentate upper arch with only 7 maxillary teeth remaining (17, 13, 12, 11, 21, 22, and 23). The patient had partially dentate lower arch with 10 teeth remaining (37, 34, 33, 32, 31, 41, 42, 43, 44 and 45).

A maxillary cast open bulb obturator prosthesis and mandibular partial removable dental prosthesis were planned for this patient [Figure 1]. Diagnostic impressions of the upper and lower arches were made using irreversible hydrocolloid impression material (Vignette Chromatic Alginate, Dentsply Sirona). The defect was covered with wet gauze to prevent the flow of impression material into the defect. The impression of the defect was made using admix impression technique. The impression of the maxillary arch including the defect was made using thin mix of irreversible hydrocolloid impression material. This primary impression recorded the relevant intraoral structures on the nonresected side and part of the resection defect. The impressions were then poured in dental stone (Gem stone, Shruthi products, India) to obtain primary casts. The cast was surveyed and the cast partial denture design of the prosthesis was decided. The obturator

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Corresponding Author: Dr. Sariga Kanakaraj, Department of Prosthodontics, Government Dental College, Thiruvananthapuram, Kerala, India.

prosthesis was to be retained by circumferential clasp and I bar clasps. Before making the secondary impression for the fabrication of metal framework, rest seats were prepared on the upper canines and molar. Secondary impression was made using putty impression material (Avue Gum Putty, Korea) and light body impression material (Avue Gum Light Body, Korea). The master cast was poured in Type IV stone (Ultra Real Dental stone, Shruthi products). The metal framework was fabricated and inserted into the patient's mouth to evaluate the fit.

Three metal clasps engaged the maxillary canines and maxillary right second molar to stabilize the framework for the secondary (altered cast) impression. The defect side was again molded using admix impression technique and secondary (altered cast) impression was made using light body impression material (Avue Gum Light Body, Korea). The stone cast was then modified to an altered cast; segment of the cast corresponding to the defect was reduced until the secondary (altered cast) impression of the defect could be placed on it without any interference. After positioning it, impression of the defect area was poured in Type IV stone to produce a definitive cast for the fabrication of the bulb. The wax pattern for the bulb was made using modeling

wax (3 mm thickness). The wax was extended till the superior extent of the lateral walls. To make the bulb hollow, dental plaster was poured into the wax pattern until 2 mm short of the metal framework border. Then, a layer of wax was placed just below the framework to enhance mechanical retention. The framework was positioned on the cast and waxed up. Putty impression material was placed on the framework to block the undercuts. Then, the cast was invested and bulb was fabricated using heat polymerized acrylic resin. The open bulb along with the framework was evaluated intraorally and checked for the extensions. Occlusal vertical and horizontal dimensions were determined and the casts were articulated. Artificial teeth were arranged and evaluated intraorally. Occlusion and esthetics were also verified. The partial removable dental prosthesis was processed with heat polymerized denture base acrylic resin. The maxillary hollow bulb obturator was trimmed and polished. It was evaluated intraorally and necessary adjustments made. The patient was instructed to follow hygiene procedures regularly. Follow-up appointments were recommended every 3–6 months to evaluate the fit of the prosthesis.

DISCUSSION

Various factors that affect the management of maxillary defects are the presence of teeth, amount of remaining

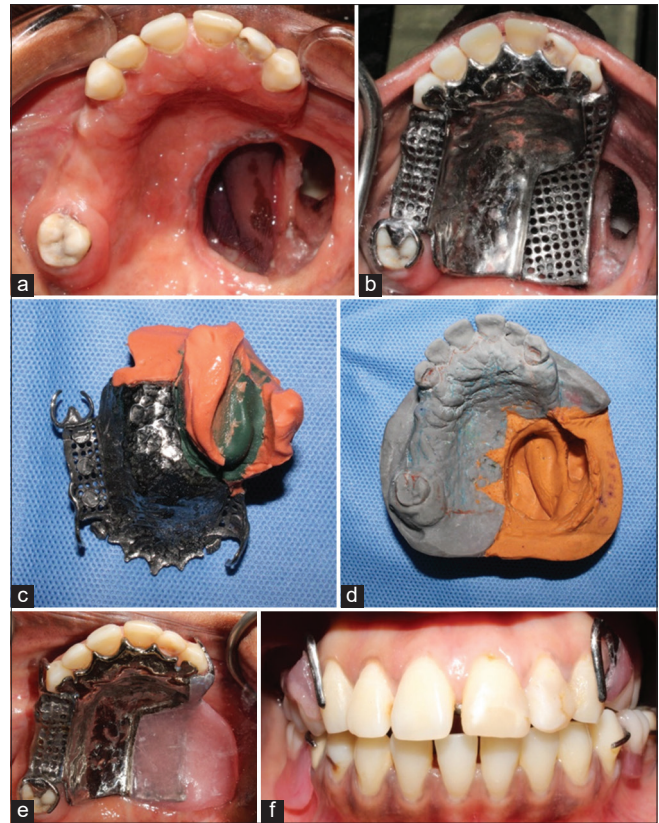


Figure 1: (a) Pre-operative intraoral photo. (b) Metal framework try in. (c) Secondary (altered cast) impression. (d) Altered cast. (e) Metal framework with hollow bulb inserted into defect. (f) Completed prosthesis in occlusion

support area and characteristics of the defect. When these factors are detrimental on the treatment outcome, success of the prosthetic management of the defect becomes a major challenge. Adequate retention of the prosthesis is essential for good prognosis. The prosthesis should also maintain a harmonious relationship with the tissues adjacent to the resected site. The weight of the prosthesis is a major factor to consider in relation to the retention and comfort of the patient. Hence, it is always advisable to fabricate light weight prosthesis by making the obturator bulb hollow. The obturator bulb can be made hollow using a closed bulb or open bulb. The advantages of open hollow obturator are reduced weight, hygiene maintenance, easier fabrication and improved speech.

In case of maxillary defects, two-step (Altered Cast) impression technique provides an accurate registration to relate the functional tissues of the defect to the adjacent soft tissues and teeth. The impression made using metal framework helps in minimizing inaccuracies during jaw relation and final fit of the prosthesis. It ensures adequate closure of the maxillary defect with the obturator thereby improving the oral function, speech and esthetics.

CONCLUSION

The present case report shows the prosthetic rehabilitation of a partial maxillectomy patient with Aramany Class II defect using a hollow bulb cast obturator. It involved the fabrication of a cast partial denture framework onto which the hollow bulb was attached. This helped in restoring function by improving masticatory efficiency and speech by providing resonance to the voice and also improved esthetics of the patient. The hollow bulb obturator was more comfortable to the patient because of its reduced weight.

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