



PROSTHETIC REHABILITATION OF HEMIMANDIBULECTOMY DEFECT: A CASE REPORT

Dental Science

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ABSTRACT

The prosthodontic rehabilitation of patients with acquired mandibular defects has been a challenge for years. Mandibular resections compromise the balance and symmetry of mandibular functions so the aim of the Prosthodontist is to be able to enhance appearance, function, and speech. Techniques over the years include physiotherapy exercises to reduce the deviation and improve the jaw opening and removable prostheses for partially or completely edentulous candidates.

Here is a case where hemimandibulectomy was done on the right side and was reconstructed with the autogenous graft and then interim prosthesis was given to the patient. It was planned to rehabilitate the patient using a cast partial denture with conventional clasping with alternate buccal and lingual retention as required for Cantor and Curtis Type IV defect.

KEYWORDS

Hemimandibulectomy, cast partial denture, altered cast technique, functional impression

INTRODUCTION

The prosthodontic rehabilitation of patients with acquired mandibular defects has been a challenge for years. The most common intraoral sites for squamous cell carcinoma (SCC) are the lateral margin of the tongue and the floor of the mouth. Both locations predispose the mandible to tumor invasion, often necessitating its resection in conjunction with large portions of the tongue, the floor of the mouth, and the regional lymphatic system. Disabilities resulting from such resections may include impaired speech articulation, difficulty in swallowing, problems with mastication, altered mandibular movements, compromised control of salivary secretions, and severe cosmetic disfigurement(1). With time, reconstruction techniques have improved and these challenges have become manageable which has resulted in the prognosis for these patients improving. Mandibular resections compromise the balance and symmetry of mandibular functions so the aim of the Prosthodontist is to be able to enhance appearance, function, and speech.

The unilateral loss of mandibular continuity due to surgery or trauma results in mandibular deviation toward the defect side. The reason for the deviation is multifactorial and includes the location and extent of the resection, the amount of soft tissue involvement, the degree to which innervation has been involved, how tightly the surgeon closed the wound, and the presence of remaining natural teeth.(2)

When the mouth is opened, this deviation increases, leading to an angular pathway of opening and closing. It is not uncommon to note 1- to 2-cm deviation laterally and 2- to 4-mm retrusion posterior to the chin point during maximum opening. When the incisal point of the mandible is traced, this diagonal pathway of closure is obvious. During mastication, the entire envelope of motion occurs on the surgical defect side (Fig 1). Some patients are unable to effect lateral movements toward the non defect side and are incapable of making protrusive movements. Patients whose resections are closed with a myocutaneous flap or a free tissue transfer demonstrate much less deviation, regardless of whether or not mandibular continuity is restored.(1)

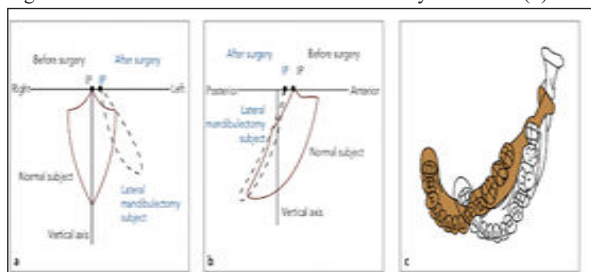


Figure 1: (a) Envelope of motion as viewed in the frontal and (b)

sagittal planes in a normal patient (solid lines) and a patient who has undergone lateral mandibular resection(broken lines), (c) position of the remaining mandible in open (shaded) and closed (white) positions. Techniques over the years include physiotherapy exercises to reduce the deviation and improve the jaw opening and removable prostheses for partially or completely edentulous candidates.

A classification of mandibular defects has been described by Cantor and Curtis (3). This system classifies defects based on remaining structures. Cantor and Curtis Classification Class I: Mandibular resection involving alveolar defect with preservation of mandibular continuity. Class II: Mandibular Resection defect involving loss of mandibular continuity distal to the canine area. Class III: Resection defect involves loss up to the mandibular midline region. Class IV: Mandibular Resection defect involving the lateral aspect of the mandible, but are augmented to maintain pseudo articulation of bone and soft tissues in the region of the ascending ramus. Class V: Mandibular Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations. Class VI: Similar to class V, except that the mandibular continuity is not restored(3).

Here is a case where hemimandibulectomy was done on the right side and was reconstructed with the autogenous graft and then interim prosthesis was given to the patient.

Case Report:

The patient was referred to the Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Nerul, Navi Mumbai, with a complaint of multiple missing teeth.

History of hemimandibulectomy for resection of ameloblastoma followed by a fibula bone graft was given by the Department of Oral and Maxillofacial Surgery.

On examination there was missing teeth in the fourth quadrant of the jaw from 41 to 47.

It was planned to rehabilitate the patient using a cast partial denture with conventional clasping but with added retention from attachments with alternate buccal and lingual retention as required for Cantor and Curtis Type IV defect.

Two ball attachments were planned for added retention. The 31 was root canal treated and submerged. The 32 and 33 were given EDS posts (Essential Dental Sytems, Inc).

Countersinking the post into the tooth prevents high apical stress under function common to other passive posts.

After an initial diagnostic impression, a special tray was fabricated on which a secondary impression was made by greenstick border moulding followed by mucostatic impression. Secondary casts obtained were placed on a surveyor for examination and design of the cast framework. Master casts were duplicated, refractory cast were obtained, and the design was transferred from the master cast to the refractory cast. Investing and casting was completed. The completed framework was examined to ensure that it fits the cast accurately. The framework along with an acrylic resin custom tray was used to carry out border moulding in the patient's mouth and a functional impression was made using light body addition silicone. While making an impression, finger pressure was applied only to the parts of the framework that comes in contact with the teeth.

The master cast was altered in the laboratory by placing grooves to aid in the retention. Complete seating of the framework on the cast was essential before it is fixed in place with sticky wax. The final impression was beaded and boxed and poured with die stone. An occlusal rim was fabricated and the jaw relation records were obtained. After teeth arrangement, a try-in was done following which a final denture was fabricated. A pick up impression was to be carried out to create space for the nylon caps for the ball attachments in the 32 and 33. The nylon caps and a teflon separator were placed on the ball attachments. The denture was relieved in the area of the 32 and 33 to accommodate cold cure acrylic and the pick up impression was carried out in the denture as the patient was guided into centric.

The excess acrylic was removed and the final denture was delivered to the patient.



Figure 2: Pre-Treatment IntraOral View

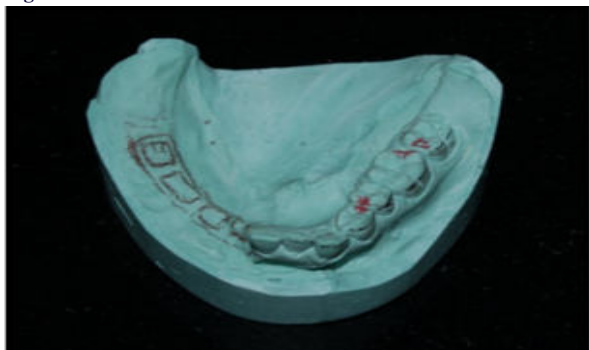


Figure 3: Cast Partial Denture Design



Figure 4: Final impression

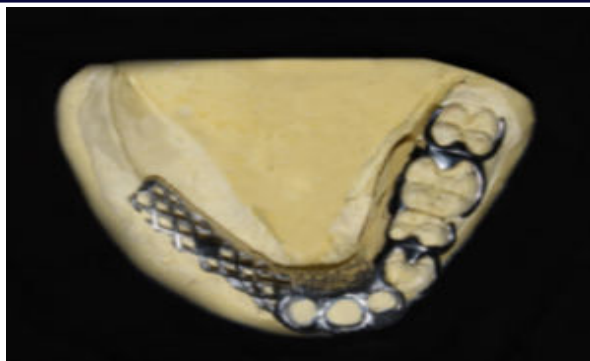


Figure 5: Cast partial denture framework



Figure 6: Checking for the framework fit intraorally



Figure 7: Functional impression

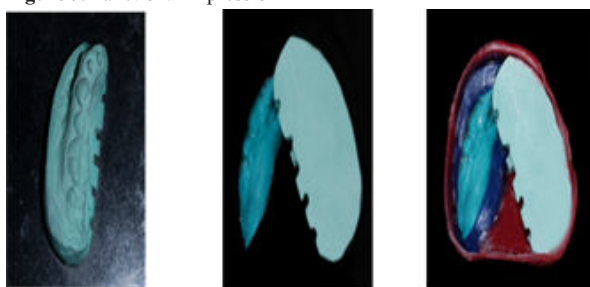


Figure 8: Altered Cast Technique



Figure 9: Altered Cast



Fig 10: Try-in



Figure 11: Pick-up impression



Figure 12: Post treatment smile

CONCLUSION:

Rehabilitation is an essential phase of cancer care and should be considered from the time of diagnosis in a complete and comprehensive treatment plan. As prosthodontists, we must not only preserve what remains, but also use it to aid in retention to give the patient the best means of treatment by using an array of tools that the world of prosthodontics provides. In the above case, we have maximised retention for this young patient by restoring the loss of the lateral aspect of her mandible through methods such as fibula grafting, the use of posts, attachments and a reliable cast partial denture. This comprehensive method restores function, aesthetics and confidence in patients who have undergone cancer treatment.

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