

CONVENTIONAL COMPLETE DENTURE FOR A PATIENT WITH MALUNITED FRACTURE OF MANDIBLE: A CASE REPORT

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ABSTRACT

A patient with malunited fracture of mandible require preprosthetic reconstructive surgery followed by implant-assisted overdentures. In this case report, conventional complete dentures were fabricated for the patient as he refused any invasive treatment. The fabrication procedure of the denture was carefully modified according to anatomical and functional situation of the patient to achieve adequate retention and stability. Complete dentures thus fabricated provided comfort and sufficient function to the patient.

Keywords: Oral preprosthetic surgery, Denture, Denture stability.

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INTRODUCTION

The rehabilitation of a patient following trauma presents a unique prosthetic challenge. The most common prosthetic treatment problem with such patients is, getting adequate retention, stability and support. All basic principles of complete denture construction must be considered, and the manner in which these principles are applied and interpreted must be modified because of the unusual anatomic and functional situation.¹

Bilateral fractures of the edentulous mandible frequently occur from a combination of direct and indirect impact requiring surgical management.²⁻⁷ The normal healing process of fracture is divided into 4 temporal phases: inflammatory, chondrogenic, osteogenic, and remodeling, each characterized by specific tissue differentiation events.⁸ Normal healing is “bony union,” in which the fractured bone end is united by new bone tissue, with anatomic reduction and fixation resulting in restoration of function and prevention of deformities.⁹ Although most fractures heal, some fail to heal and become abnormal unions

such as bony malunion, delayed union, nonunion, and pseudoarthrosis.⁹⁻¹²

Virtually, malunion is “bony union” and the fractured bone ends are united by normal bony image in radiograph. However, the normal anatomic structure isn't restored because of the unsatisfactory reduction.⁹ For these patients, if necessary, the malunion should be treated by refracture and repositioning.^{13,14}

Without preprosthetic reconstructive surgery, denture fabrication in such patients becomes extremely difficult. After reconstructive surgery, implant-assisted overdentures may improve denture retention and stability, but some patients cannot afford this treatment. In such patients, conventional complete dentures are constructed with certain modifications to enhance retention and stability.¹ Therefore, this article describes the fabrication of conventional complete dentures for a patient with malunited fracture of the mandible.

CASE REPORT

Patient examination, diagnosis and treatment planning

A 65yr old male patient came to the Department of Prosthodontics, at Bhojia Dental college and Hospital, with the chief complaint of difficulty in chewing and mastication after having lost all his teeth. A detailed case history revealed, history of assault by a family member 3yrs back resulting in vertical fracture of mandible at right body and left parasymphysis region. The patient was operated 2 months after the assault. On the left side the patient was operated with intra-oral rigid internal fixation (IORIF) with 2.5mm, 4 hole titanium plating. The right body fracture was operated subsequently in second surgery with 3mm, 5 hole titanium reconstruction plate. However, the reduction was unsatisfactory and the patient's face showed assymetry after the surgery.

Dental history revealed that the patient was edentulous for past 4 yrs with no history of previous use of dentures. No radiographic records of the previous treatment were available with the patient.

Extraoral examination (Figure 1) revealed assymetry and step-deformity in the lower mandibular border of right side. Residual scar could be seen in the lower back cheek region of the right side.

Intraoral examination (Figure 2) showed that the shape and form of mandibular ridge was assymetrical because of malunion, resulting in shortening of length of right arch with reduced buccal shelf and retromolar pad area. However, the retromylohyoid space of the right arch was extended probably due to inferior placement of attached muscles after surgery.

Ortho pan-tomogram (Figure 3) revealed presence of titanium plates and step-deformity at the lower border of right side of mandible.

When given the option of surgical reconstruction of the defect, patient refused an additional surgery and requested a noninvasive and economical treatment option. Therefore, it was decided that conventional complete dentures would be fabricated without any further surgical procedure.

FABRICATION OF COMPLETE DENTURE PROSTHESIS

Stainless steel stock edentulous trays and impression compound (Y-Dents impression compound; MDM Corporation, New Delhi, India) were used to record the preliminary impressions. Special consideration was given to the right back region of the mandible which required molding of the tray (Figure 4) according to the shape of the ridge on buccal and distal border. More extension was achieved in the right alveololingual sulcus because the tongue movement was little restricted.

Self-cure acrylic (DPI Cold Cure; Dental products of India, Mumbai, India) custom trays were fabricated with full spacer technique, for both maxilla and mandible. Border molding (Figure 5) was done with low-fusing impression compound (DPI Pinnacle; Dental products of India, Mumbai, India) and secondary impression (Figure 6) made with ZOE impression paste (DPI Impression paste, Dental products of India, Mumbai, India).

Due to malalignment of the lower jaw with respect to upper, horizontal jaw relation was recorded in "habitual position"¹⁵ and not in centric relation. Zero-degree teeth (Premadent; Super dental products, Delhi, India) were used. On the right side first premolar and second molar were eliminated in the arrangemen (Figure 7).

After try-in dentures (Figures 8,9) were processed in heat-cure acrylic resin (DPI Heat Cure; Dental products of India, Mumbai,India) by conventional technique.

DENTURE INSERTION AND POST-INSERTION CARE

Occlusion of the denture was evaluated and adjusted intraorally (Figure 10). Post-insertion instructions were given. Patient was recalled after 24 hrs for necessary modifications. The extensions of the alveololingual sulcus in the posterior region were left as such. After 24hrs of observation patient did not complain of any soreness or difficulty in swallowing in this region. To examine his adaptability to the dentures and level of satisfaction, patient was followed further at regular interval of 2 months, for initial 1 year.



Figure 1: Extraoral view of the patient showing facial asymmetry



Figure 2: Intraoral view of the patient showing obliterated buccal shelf and retromolar pad area



Figure 3: Ortho pan-tomogram (OPG) showing titanium plating at right body and left parasymphysis region of the mandible



Figure 4: Molded stainless steel stock tray



Figure 5: Preliminary mandibular impression



Figure 6: Mandibular border molding in custom tray



Figure 7: Mandibular secondary impression



Figure 8: Teeth Arrangement



Figure 9: Polished and occlusal surface of the denture fabricated



Figure 10: Alveololingual extension of mandibular denture



Figure 11: Extra-oral view of the patient with prosthesis

DISCUSSION

Trauma followed by malunion of the fracture affected the mandibular ridge form and shape in the patient. The loss of right buccal shelf and retromolar pad at the fracture site, resulted in assymetry of the arch. To achieve denture stability proper border extensions, polished denture surface contours and harmonious occlusion were developed.

During preliminary impression stock tray was modified according to ridge form and record the maximum area coverage. The extension into the alveololingual sulcus provided guidance for placement, stability and retention of lower denture.

There was difficulty in recording centric relation of the patient. This may be due to trauma to the tissues which was followed by surgical intervention. So the patient had acquired a new "habitual position"¹⁵ and the horizontal jaw relation were recorded in this position.

Use of zero degree teeth provided stability to the dentures by allowing lateral freedom of mandibular movements. The assymetrical arrangement of teeth was accepted by the patient because of assymetry of the arch.

Periodic patient recall was important to evaluate patient adaptability and satisfaction to the dentures.

CONCLUSION

Though the denture bearing tissues had modified form and shape, the polished surface, occlusal surface and tissue surface of the prosthesis were carefully modified to give favorable denture stability. Application of conventional prosthodontic principles along with patient cooperation can achieve long term

success of prosthesis and predictable patient satisfaction in such compromised situations.

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