

FUNCTIONAL REHABILITATION OF SEGMENTAL MANDIBULECTOMY PATIENT WITH TWIN OCCLUSION PROSTHESIS: A CASE REPORT

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ABSTRACT:

The prosthodontic rehabilitation of the patient with segmental mandibulectomy is always a challenging venture due to the deviation of the residual fragment towards the defective side, resulting in loss of balance and symmetry of mandibular function followed by several collateral disabilities. The primary focus of prosthodontic rehabilitation is the establishment of an appropriate stable and acceptable functional occlusion on the nonsurgical side. This article presents a case report of functional rehabilitation of the patient with segmental mandibulectomy by twin occlusion prosthesis.

Key words: Segmental mandibulectomy, Prosthodontic rehabilitation, Twin occlusion prosthesis



INTRODUCTION:

Mandibular resection or mandibulectomy is the surgical removal of a portion or all of the mandible and the related soft tissues.^[1] Common causes for mandibular resection are tumour, and to a lesser degree, trauma and osteoradionecrosis; which may lead to disabilities, including problems in mastication, impair phonetics, difficulty in swallowing, deviation of the mandible during functional movements, compromised control of salivary secretions and severe cosmetic disfigurement.^[2,3,4]

The maxillofacial prosthodontist subsequently faces the problem of correcting the resultant deviation of

the remaining mandibular segment toward the surgical side and to establish an appropriate stable and functional occlusion on the nonsurgical side. The degree of deviation may vary and is further complicated by extensive soft tissue loss resulting in tight wound closure and scar contracture and muscle imbalances secondary to the primary resection.^[2,5,6,7,8]

Various prosthetic treatment modalities available are removable mandibular guide flange prosthesis, palatal ramp, implant-supported prosthesis and two rows of maxillary posterior teeth on unresected side and depending upon the clinical situation, appropriate treatment modality should be selected.^[2,3,4,8-13]

This article describes prosthetic rehabilitation of a patient with segmental mandibulectomy with a simple, effective functioning twin occlusion prosthesis.

CASE DETAIL:

A 60-year-old male patient with right side segmental mandibulectomy reported to the Department of Prosthodontics, Pacific Dental College and Research Institute, Udaipur, India with the complaint of difficulty in chewing food and asymmetry of lower jaw. Medical history revealed that patient was diagnosed with squamous cell carcinoma of right side of the mandible involving the ramus of the mandible and had undergone segmental resection of lower right side of the mandible for same, 1 year back.

An extra oral examination indicated facial asymmetry and a convex profile with deviation of mandible towards the resected side. On intraoral examination, teeth present were 11,12,13,15,16,18,21,22,23,24,25,32,33,34,35,36,37,38,42,43 and root stump i.r.t 14 which was later extracted. (Figure 1) The discontinuity of right side residual mandibular ridge beyond canine region involving ramus and condyle was also observed. (Figure 2)

Clinical examination of the surgical wound closure showed consolidated cicatricial tissues while the remaining natural teeth in both arches were attrited with moderate loss of periodontal support.

Therefore, a treatment was planned for fabricating twin occlusion acrylic removable partial denture for achieving acceptable functional occlusion on unresected side.

PROCEDURE

1. Maxillary and mandibular impressions were made using irreversible hydrocolloid impression material (Zelgan 2002, Dentsply India Pvt. Ltd., India).

2. Maxillary primary casts was poured with Type II dental plaster (White Gold, Asian Chemicals, India) and acrylic custom tray was fabricated with auto-polymerizing acrylic resin (DPI, self-cure acrylic powder and liquid, India). While mandibular definitive cast was poured from Type III dental stone (Neelkanth Stone, Neelkanth Healthcare Pvt. Ltd., India).

3. Maxillary dual impression was made and definitive cast was poured with Type III dental stone.

4. The maxillary self-cure acrylic resin denture base with wax occlusal rim was fabricated on master cast which was later oriented to the semi-adjustable articulator using facebow transfer records.

5. Patient mandible was guided to centric relation and the maxillomandibular relationship was recorded with the help of interocclusal record.

6. After articulation, two sets of anatomic teeth were selected. First row of teeth were arranged as per the contour of the patient's ridge and the other set were arranged palatally to the first row on the unaffected side in the maxillary arch on which the mandibular teeth will occlude, such that the buccal inclines of palatal cusp of second row and mandibular canine of right side guide the mandible into the centric relation.

7. Wax try-in was done and for retentive purpose, C -clasps made up of 21 gauge orthodontic wire were attached i.r.t 13, 15 and 24 and 25.

8. Acrylization was done for maxillary removable partial denture with twin occlusion. After processing, finished and polished heat cure acrylic maxillary prosthesis with twin occlusion (double rows of acrylic teeth) was inserted (Figure 3 and 4). Post-insertion instructions were given. Follow-up evaluation every 3-6 months showed functional and psychological satisfaction of the patient. (Figure 5).

DISCUSSION:

The mandible is a single bone that forms the peripheral boundaries of the floor of the oral cavity with bilateral attachment of muscles of mastication, generating a variety of complex mandibular movements useful in speech, swallowing, mastication and respiration. Any disruption in continuity of mandible, has the potential, to disrupt any of these functions.^[5]

When surgery includes a segmental mandibulectomy, the mandibular functional movements and occlusal proprioception differ from that of movements and occlusion of the normal mandible as the residual segment will retrude and deviate toward the surgical site leading to compromised masticatory function.^[14] Furthermore, during mastication, entire envelope of motion occurs on surgical defect side which is further complicated by unilateral muscle loss, altered maxillomandibular relationship and decreased interocclusal contacts.^[6,15,16,17] Therefore, the resection of a portion of the mandible with loss of mandibular continuity is usually more debilitating as compared to resection without loss of mandibular continuity.^[7] Hence, functional rehabilitation of such patient is the one of the most challenging and demanding endeavour.^[7,8,10]

Factors that affect the amount of prosthetic rehabilitation include the site and extent of surgery [Cantor and Curtis classification], the amount of soft tissue involvement, the degree to which sensory and motor innervations has been involved, how tightly the surgeon closed the wound, the effect of radiation, presence or absence of teeth and psychological impact.^[18,19,20,21]

In literature, various prosthetic treatments has been described and depending upon the clinical situation

appropriate option should be selected. Swoop proposed the use of a palatal ramp, while Rosenthal suggested the use of two rows of maxillary posterior teeth on unresected side.^[11,22,23] Mathew A and Thomas S delivered a guiding flange prosthesis to a patient with segmental mandibulectomy. Guide flange therapy is more successful in patients where resection involves only bony structures with minimal sacrifice of tongue, floor of the mouth and adjacent soft tissues.^[6]

This article highlights functional rehabilitation of segmental mandibulectomy patient with twin occlusion prosthesis. In the present case, it was observed that on manual guidance together with guidance provided by patient's right side mandibular canine, patient was able to move the mandible towards unresected side, thus achieving acceptable mediolateral position. In order to interlock this position and attain acceptable occlusion with the remaining natural teeth on unresected side, a twin occlusion prosthesis was fabricated on unresected side, compensating for the deviation that can provide a surface against which the natural teeth of the residual segment can occlude. The teeth slide over one another down the buccal incline made by the palatal cusps of second row of teeth for achieving a functional occlusal position. Hence, the inner row guides in interlocking of acceptable mediolateral position with appropriate functional occlusion whereas the outer

row supported the cheeks enhancing the aesthetics. This technique enabled the patient to adapt well to the prosthesis and masticate appropriately and helped to deal with the physical and psychological disabilities.

The tissue in the resected region was scarred, uneven, unsupported by bone and movable in various degree, hence made the area unsuitable to be covered by any prosthesis or to receive loading.

An organized exercise programme was advised to the patient consisting of the patient grasping the chin and moving the mandible away from the surgical side, helping patient in improving mandibular control ability.

The prosthodontic rehabilitation of patients with segmental resection of mandible is always a challenging task, with major objective of restoration of function and aesthetics. In literature, it has been recommended that immediate reconstruction of resected part of mandible should be done to recover both facial symmetry and masticatory function.^[16,17] Also osseointegrated dental implants provide a treatment modality that may adequately rehabilitate oral functions of the patients so that they can lead a healthy life.^[23] However this is an expensive modality which may be not be acceptable to all strata of patients and also depends on remaining bone quality.

CONCLUSION:

The successful management of a segmental mandibulectomy patient calls for a multidisciplinary approach. The need for early consultation with the maxillofacial prosthodontist has to be emphasized in achieving maximum function and aesthetics along with early guidance therapy, individualized therapy and patient cooperation. The present case report describes the

functional rehabilitation of patient with segmental resection of mandible using twin occlusion prosthesis, which not only helped the patient in achieving acceptable functional occlusion but also improved aesthetic which lead to change in perception of the patient towards life.

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FIGURES:



Figure 1- Intraoral view of maxillary arch



Figure 2 - Intraoral view of mandibular arch



Figure 3 - Maxillary prosthesis with twin occlusion



Figure 4 - Definitive intraoral result



Figure 5 - Satisfied patient with the prosthesis