

CASE REPORT

Prosthetic Rehabilitation of Cantor and Curtis Class II Mandibular Defect using Cast Partial Denture Therapy: A Case Report

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ABSTRACT:

Surgical removal of tumors in mandible leads to discontinuity of bone. Loss of mandibular continuity causes deviation of remaining mandibular segment towards the resected side and rotation inferiorly due to muscle pull and scar contracture affecting mastication and esthetics. The resection can be total or segmental depending on the lesion. The restoration of the masticatory function is most important. Cosmetic improvement is rarely sufficient to restore the patient's face to the normal facial contour. Surgical reconstruction may not be always possible. Thus Prosthetic rehabilitation plays a major role in these patients. Cast partial denture prosthesis for mandibular defects is a permanent solution to mandibular deviations, as surgical reconstruction by implants and grafts is always not feasible in every patient. This clinical report describes rehabilitation of Cantor and Curtis Class II Mandibular Defect using simple and most effective prosthesis, Cast Partial Denture in economic constraints.

Keywords; Cantor and Curtis II, Hemimandibulectomy, Cast Partial Denture, Prosthetic Rehabilitation.

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INTRODUCTION

Mandibular defects resulting from ablative tumour surgery can lead to functional disturbance in deglutition, speech, and patient psychology¹. Restoration of form, function and esthetics in a patient who has undergone hemimandibulectomy is a valuable service, and pose a challenge for the prosthodontist. The prosthetic treatment outcome is often unpredictable and restoration of esthetics provides patient with marked self-confidence and Improves and restores normal occlusion to the patient.

Mandibular defects can be classified into continuity and discontinuity defects². Loss of continuity of the mandible destroys the balance and symmetry of mandibular function, leading to altered mandibular movements³. and in Discontinuity defects the entire segment of the mandible is

resected which leads to deviation of the residual fragment towards the surgical site apart from the other disturbances.

A classification of mandibular defects has been described by Cantor and Curtis. Although the classification system is suggested primarily for edentulous patients, it is also applicable to partially edentulous patients. This system classifies defects based on remaining structures.

CANTOR AND CURTIS CLASSIFICATION⁴ (Figure 1)

Class I: Mandibular resection involving alveolar defect with preservation of mandibular continuity.

Class II: Resection defects involve loss of mandibular continuity distal to the canine area.

Class III: Resection defect involves loss up to the mandibular midline region.

Class IV: Resection defect involves 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: Resection defect involves the symphysis and para-symphysis region only, augmented to preserve bilateral temporomandibular articulations.

Class VI: Similar to class V, except that the mandibular continuity is not restored.

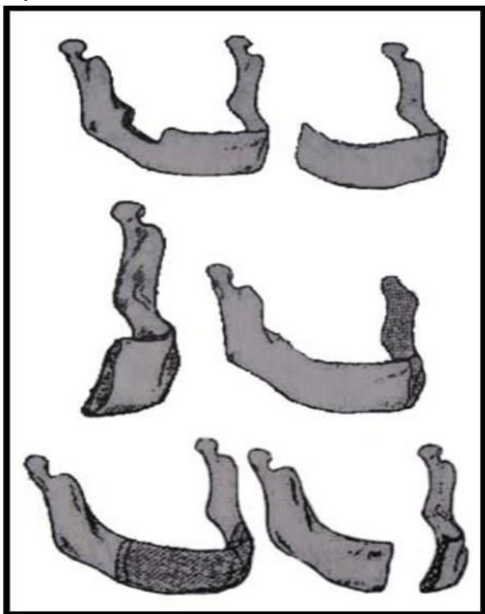


Figure 1: CANTOR AND CURTIS CLASSIFICATION

CASE REPORT:

A 36 yrs old male reported to the department of prosthodontics with Chief complaint of loss of teeth and difficulty in eating food due to missing teeth in lower right teeth region of the jaw. Past dental history revealed that he was diagnosed with benign growth in the right side of the mandible. The patient underwent with segmental mandibulectomy 6 months ago. Clinical examination

revealed missing right mandible from distal to canine to the condyle along with severe deviation of the mandible towards the resected site with lack of proper contact between maxillary and mandibular teeth. An orthopantomogram (OPG) [Figure:2] revealed Titanium reconstruction plate was used to reconstruct and give proper shape to the affected side of the mandible. An extraoral examination showed facial asymmetry, concave profile and ovoid face [Figure: 3]. Based on the clinical situation, a Cast partial removable partial denture was planned.

Impressions was made and a guide Flange Prosthesis [Figure: 4] was fabricated and delivered to the patient that had to be used for two to three weeks for the correction of the deviation of the mandible.

In the next appointment impression was made and diagnostic casts were prepared. Initial survey of diagnostic cast was performed and mouth preparation was done following which the final impression was made using polyvinyl siloxane impression material. The cast was subjected to scanning for fabrication of CPD frame work using CAD CAM technology [Figure: 5].

The design was completed and milling was carried out. The finished metal framework was tried in patient's mouth for fit and finish [Figure: 6]. The framework was also carefully evaluated for any interferences by hard and soft tissue in the oral cavity. Further, Jaw relation, try-in of denture and acrylisation procedures was carried out and finally the Cast Partial Denture was made ready for delivery to patient.

Tissue surface was relined with soft-liner prior to final delivery, Prosthesis was checked for comfort, masticatory efficiency and buccal fullness and instructed about the insertion and removal of the prosthesis. Daily oral hygiene instruction was reinforced. After the initial period of postinsertion adjustment, follow-up appointments were scheduled. The patient reported improvement in speech quality and mastication in the subsequent appointments. [Figure: 7].



Figure 2: An orthopantomogram (OPG)



Figure 3: Extraoral examination showed facial asymmetry, concave profile and ovoid face



Figure 6: Finished metal framework



Figure 4: Guide Flange Prosthesis

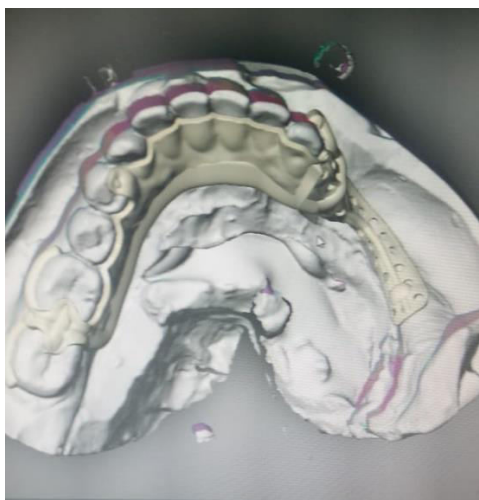


Figure 5: Fabrication of CPD frame work using CAD CAM



Figure 7: Follow-up

DISCUSSION

The patient discussed in this case report had resection of mandible on the right side involving the dentition distal to canine. It may be discussed as the class II situation as per Cantor and Curtis classification. Following resection of mandible, the part of the bony mandible and teeth that remains has to articulate with normal structures of maxilla. When a part of mandible has been resected, the movements

of the mandible in the functional range and occlusal proprioception differ from that of movements and occlusion of the normal mandible. The remaining mandibular segment retrudes and deviates towards the surgical site. On opening the mouth, the deviation increases, leading to an angular pathway of opening and closing. The mandibular surgical resection also significantly alters the maximum occlusal force⁵ and masticatory performance seems to improve with prosthodontic rehabilitation⁶. Several prosthesis have been used to reduce or eliminate mandibular deviation like cast metal mandibular resection restoration⁷, acrylic guidance flange, cast metal guidance flange prosthesis⁸, guidance ramp in the maxillary⁹, functionally moulded palatal ramp¹⁰ etc. A mandibular guidance flange can be used when the mandible can be positioned in an un-interrupted way, whereas if some resistance is encountered in positioning the mandible. Surgical resection of a portion of the mandible, muscles of mastication, and some teeth can cause an imbalance of the remaining muscles of mastication, altered and restricted mandibular movements and decreased forceful mandibular closure. The basic objective in rehabilitation of such patients is retraining the remaining mandibular muscles to provide an acceptable maxillomandibular relationship of the remaining portion of the mandible. The mandibular guidance flange can be given to achieve an acceptable maxillomandibular relationship. The use of mandibular guidance flange as treatment for segmental hemi-mandibulectomy has been reported. Earlier the mandibular guidance therapy is initiated, more successful is the result. The flange engages the maxillary teeth during mandibular closure, and hence directs the mandible into an optimal intercuspal position. Presence of teeth in both the arches is important for effective guidance and reprogramming of the mandible¹¹. The open-bite was corrected with an overlay denture, to establish occlusion on either side. Maximum possible extension of denture flange is aimed on the normal side and on the resected side to enhance stability and support. An overlay denture is a reversible, conservative and economic solution to these situations which allows esthetic and functional rehabilitation which is also the patient's expectation from treatment¹².

CONCLUSION

Under the light of above mentioned data, it can be concluded that fabrication of cast partial denture is a good treatment option in rehabilitation of patients who have undergone hemi mandibulectomy due to various reasons. It appears to be the most effective and least expensive treatment procedures in economic constraints. However; further studies in future are recommended.

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