

Prosthodontic Rehabilitation of Cantor and Curtis Class III Mandibular Defect Using Cast Partial Denture :- A Case Report”

Narendra.R MDS^a, **P.Sesha.Reddy** MDS^b, **Sashideepth Reddy** MDS^c, **Ashish.R.Jain** MDS^d, **S.Arunakumari** MDS^e,

^aProfessor And HOD, Department of Prosthodontics, Government Dental College, RIMS, Kadapa, India.

^bProfessor, Department of Prosthodontics, Government Dental College, RIMS, Kadapa, India.

^cProfessor, Department of Prosthodontics, Government Dental College, RIMS, Kadapa, India.

^dResearch Scholar, Reader, Department of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha University, Chennai, India

^eSenior Lecturer, Department of Prosthodontics, Government Dental College, RIMS, Kadapa, India.

Abstract

Surgical removal of tumors in mandible leads to discontinuity of bone. Prosthetic rehabilitation is a successful alternative to reconstructive surgeries. Mandibular resection leads to altered mandibular movements, disfigurement, difficult in swallowing, impaired speech and articulation, and deviation of the mandible towards the resected site. Various options for oral rehabilitation of patients with mandibular resection include maxillomandibular fixation, implant supported prosthesis, removable mandibular guide flange prosthesis, Cast partial denture prosthesis and palatal based guidance restoration 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 III Mandibular Defect Using Cast Partial Denture prosthesis following hemi mandibulectomy.

Keywords:- Cast Partial Denture prosthesis, Hemi mandibulectomy, Prosthetic rehabilitation.

INTRODUCTION:-

Restoration of form, function and esthetics in a patient who has undergone hemi mandibulectomy is a valuable service rendered by a Prosthodontist . Restoration of esthetics provides patient with marked self confidence and Improves and restores normal occlusion to the patient. Loss of continuity of the mandible destroys the balance and symmetry of mandibular function, leading to altered mandibular movements and deviation of the residual fragment towards the surgical site. In general, patients suffering extensive soft tissue loss resulting from tight wound closure, radiation therapy and those requiring a classical neck dissection exhibit the most severe mandibular deviation and dysfunction.¹⁻⁴ Conversely patients with mandibular resections resulting in little soft tissue loss have less mandibular deviation. 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.^{5,6,7}

CANTOR AND CURTIS CLASSIFICATION ¹ (Figure 1)

- Class I:** Mandibular resection involving alveolar defect with preservation of mandibular continuity (Fig 1a)
- Class II:** Resection defects involve loss of mandibular continuity distal to the canine area (Fig. 1b).
- Class III:** Resection defect involves loss up to the mandibular midline region. (Fig. 1c).
- 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. (Fig. 1d)

Class V: Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations. (Fig. 1e)

Class VI: Similar to class V, except that the mandibular continuity is not restored. (Fig. 1f)

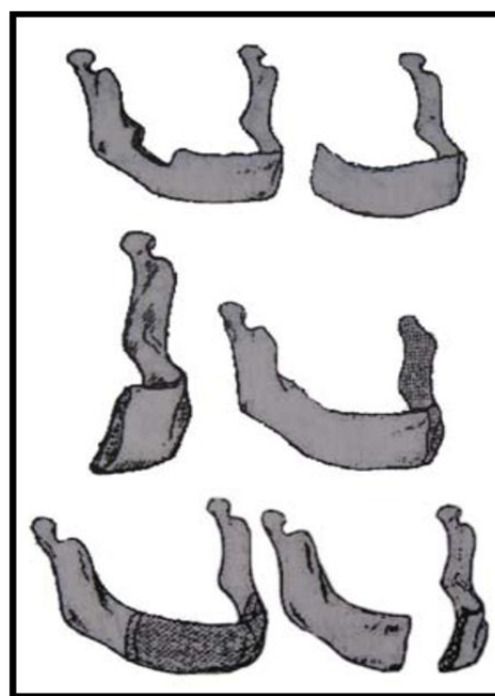


Figure 1: Cantor and Curtis Classification

All removable resection prosthesis framework designs should be detected by basic prosthodontic design. These include broad stress distribution, cross arch stabilization using a rigid major connector stabilizing and retaining components at locations within the arch to minimize dislodgement and replacement of tooth position that optimize prosthesis. By giving a cast partial denture prosthesis, minimum tissue contact is present and maximum function is restored.

CASE REPORT:

A 29 yrs old male reported to the department of prosthodontics with Chief complaint of missing teeth in lower left teeth region of the jaw. Past dental history revealed that he was diagnosed as a case of Ameloblastoma within the left mandible. The patient underwent an extensive resection of whole of left mandible before three years. Clinical examination revealed missing left mandible from the midline to the condyle, along with part of anterior mandible on the right side. Clinical examination revealed severe deviation of the mandible towards the resected site with lack of proper contact between maxillary and mandibular teeth. An orthopantomogram (OPG) revealed Titanium reconstruction plate was used to reconstruct and give proper shape to left side of the mandible and to right side of mandible till first premolar (Figure 2). An extraoral examination showed an asymmetrical face, concave profile and ovoid face [Figure 2]. Based on the clinical situation, a Cast partial removable partial denture was planned.



Figure 4: Arrangement of Artificial teeth In Occlusion



Figure 2: Preoperative OPG



Figure 5: Fabricated cast partial denture



Figure 3: Cast Partial Framework



Figure 6: Intraoral View of Cast Partial Denture

CLINICAL PROCEDURE

The patient was evaluated for the fabrication of a Cast partial removable partial denture prosthesis. Impressions were made and diagnostic casts were prepared. Surveying was done to assess the amount of undercuts on primary abutments and to assess the path of insertion and removal of the prosthesis. The removable partial denture includes occlusal rest seats on all remaining three molars. On first molar the occlusal rest seat was prepared on distal marginal ridge and second molar and third molar on mesial marginal ridge. The major connector was lingual bar and the minor connector supporting the occlusal rim was "meshwork" type and also "nail and bead" minor connector was incorporated to support the occlusal rim which will be replaced by denture bases with teeth at a later stage. The direct retainer planned was embrasure clasp with step back design on first and second molar whereas simple circllet clasp in third molar. After mouth preparation the impression were made using polyvinyl siloxane putty (virtual,Ivoclar vivident) and light bodied (virtual,Ivoclar vivident) impression material using putty wash / putty relining technique. Cast were poured using type IV die stone. On the master cast, surveying was done. "Planned block out/shaped block out procedure Were carried out and cast duplicated using agar (castogel,BEGO). Ethyl silicate bonded investment material (wirovest) was used to obtain a refractory cast over which wax pattern was adapted. The casting was done to obtain a metal framework, which was then tried in the patient mouth for fit, over which modelling wax was adapted to obtain an occlusal rim (Figure 3). Bite registration was recorded and articulation was done in a semiadjustable articulator. After teeth arrangement, wax trial was checked in the patient mouth (Figure 4). After try in procedure processing of denture was done using Injection moulding technique (Figure 5). Finally trimmed and polished cast partial denture was inserted in the patients mouth (Figure 6).

DISCUSSION:

Muscles of mastication generate complex mandibular movements useful in speech, swallowing, mastication. Loss of portion of mandible along with muscles of mastication has the potential to disrupt these functions and disrupts the form of lower one third of the face. Titanium reconstruction plate creates peripheral boundaries for the floor of the oral cavity and restores the form of face to certain extent.⁸⁻¹⁰ The cast partial denture restores the form and shape of the missing structures such as alveolar bone with teeth and gives the necessary labial support to the lower lip. The rest

seats were prepared to House the occlusal rest from which "Embrasure clasps" arise and provide the necessary retention to the prosthesis.¹¹ Duplication of Master cast was done after blockout procedure and refractory cast was prepared so that the master cast was preserved while the refractory cast contained the elevated platform as a result of planned blockout procedure making it easy for the technician to identify the area where the retentive arm and reciprocal arm supposed to come. The nail and bead minor connector were used to support the denture bases which had excess length as a result of complete mandible resection on left side.¹²

CONCLUSION:

When the mandible is not stabilized following resection and discontinuity defect results mandibular resection prosthesis should be provided to restore mastication within the unique movement capabilities of the residual functioning mandible. Fabrication of cast partial denture is a good treatment option in rehabilitation of patients who have undergone hemi mandibulectomy due to various reasons.

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