

Research Article,

A Case Report on The Prosthetic Management of a Hemimandibulectomy Patient.

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Abstract:

Mandibular defects may be a result of trauma, malignancies, osteoradionecrosis and inflammatory diseases. These defects compromise the masticatory function and esthetics if proper surgical and prosthetic management is not carried on.¹ The type of prosthesis depends on the time elapsed since surgery, the condition of the alveolar bone and mucosa, number of teeth present, the maxilla mandibular relationship, presence of mandibular deviation, financial conditions. A through treatment planning is needed before any kind of prosthesis could be given to the patient.² Thus this case report shows the prosthetic step wise management of a patient who had undergone hemimandibulectomy for ameloblastoma.

Keywords: Hemimandibulectomy, Precision attachment, Ball attachment, Cast Partial Denture, Maxillofacial Prosthesis.

Introduction:

Ameloblastoma is a slow growing, invasive oral tumor accounting for 9 to 11 % of the odontogenic tumors causing facial disfigurement, pathological fractures, masticatory difficulties and malocclusion.³ Radical surgical resection of the jaw with microvascular reconstruction provides for a suitable platform for the prosthetic phase of oral rehabilitation.⁴ Depending upon the severity of the defect, mandibular deviation, condition of the underlying bone various prosthetic options such as intermaxillary fixation, rehabilitation with conventional guidance prostheses or implant-supported prostheses are available with the prosthodontist.⁵ Inadequate financial resources and severe bone loss sometimes does not allow the placement of implant supported prosthesis. In these cases a Cast Partial Denture (CPD) is an alternative. In long span cases, the use of a precision or semi precision attachment helps improve the overall retention of the prosthesis.⁶ this case report describes the prosthetic

management of a patient suffering from Ameloblastoma who underwent right hemimandibulectomy and microvascular reconstruction. A mandibular Cast Partial Denture with semi precision ball attachment and O Rings was the treatment modality chosen for this case.

Case Report:**Diagnosis and treatment planning:**

A 28 year old female reported to the Department of Prosthodontics with the chief complaint of missing teeth in the lower right region of the mouth causing inability to chew since the last 4 years. Patient was diagnosed with Ameloblastoma of right mandibular region for which hemimandibulectomy was done with microvascular reconstruction in 2014.

(Fig 1A and 1B)



Fig 1A: OPG showing Pre-operative multilocular lesion in right mandible.

Fig 1B: OPG showing microvascular reconstruction of the right mandible after Hemimandibulectomy.

Patient gave a history of wearing an acrylic removable partial denture and was unsatisfied with the prosthesis in terms of function and aesthetics. Extra oral examination showed facial asymmetry on the right side, straight profile, cant in the interpupillary line, potentially incompetent lips, no mandibular deviation was detected and the TMJ examination showed no abnormalities

(Fig 2A, 2B).



Fig 2A: Frontal view



Fig 2B: Side Profile

Intra oral examination showed missing teeth wrt 33,32,31,41,42,43,44,45,46,47,obliterated buccal sulcus, cant in the maxillary occlusion plane ,no loss of vertical dimension and slight lingual inclination of the remaining mandibular teeth.

(Fig 3A, 3B, 3C)



Fig 3A: Maxillary arch occlusal view



Fig 3B: Mandibular arch occlusal view



Fig 3C: Frontal view

Diagnostic alginate impressions (Neocolloid Zhermack) were made for the maxillary and mandibular arches and a diagnostic mounting in centric relation was done on a semiadjustable articulator (Hanau™ Wide-View Semi-Adjustable Articulator). The patient was diagnosed with partial edentulism Kennedy's Class IV. The patient opted for a mandibular cast partial denture with a semi precision attachment.

Surveying and Tooth preparation

The mandibular cast was surveyed, due to the lingual inclination of the teeth a low survey line was present wrt 36,37 with no suitable retentive undercut. Tooth preparations were done on 34,35,36,37 to receive PFM crowns with embrasure clasp wrt 36, 37 and semi precision attachment with the abutment teeth 34 and 35. Retraction cord was placed around the prepared teeth (Ultradent Ultrapak Retraction Cord Size 000) and the final impression was made with single stage putty light body technique. (Dpi Photosil Soft Putty & Light Body).

(Fig 4)



Fig 4: Final impression made by Single stage putty light body

Try in and cementation of FDP

Wax pattern was fabricated for the FDP's wrt 34,35,36,37 as well as the Semi precision attachment. After casting metal try in was done followed by a bisque try in and occlusal adjustments. The prosthesis was luted with Type I GIC (GC Fuji Gold Label Type 1 Luting Cement).

(Fig 5)



Fig 5: Final cementation of the FDP

An acrylic custom tray was fabricated and border moulding was done before taking a final impression with monophasic technique. (Aqua phase Ultra Monophasic Denstply)

(Fig 6A, 6B)



Fig 6A: Custom tray with border moulding using low fusing compound



Fig 6B: Final impression made by Monophasic Technique.

CPD Designing, Fabrication and Insertion of the prosthesis

Wax pattern for the CPD metal framework was fabricated using 3D printing technology.

(Fig 7)



Fig 7: Wax pattern fabrication by 3D printing technology

A Cobalt Chromium framework was casted and tries in was done. Jaw relation was recorded and a facebow transfer was done.

(Fig 8)

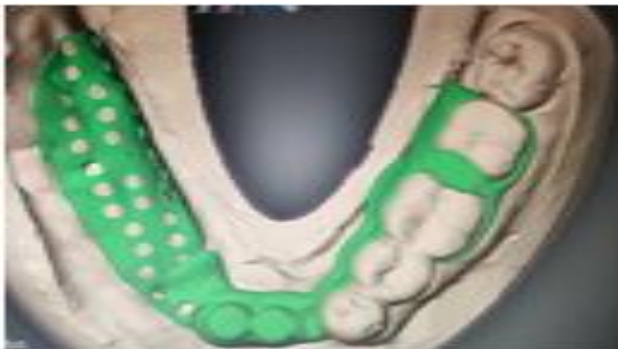


Fig 8: Jaw relation recorded

Try in of the teeth setting was done.

(Fig 9)



Fig 9: Teeth setting try in

After the approval of the teeth setting by the patient the CPD was acrylized. The pickup of the O-rings of the semi precision attachment was done in the lab to save chairside time. Occlusal adjustments were made. Patient was kept on a follow up after 24, 72 hours. All minor discrepancies were adjusted.

(Fig 10)



Fig 10: Final Prosthesis

Discussion:

Radical surgical resection of ameloblastoma is considered as the treatment modality of choice for Ameloblastoma, which leaves the patient with severe facial disfigurement, functional loss and psychological trauma.⁸ Financial constrains further delay the treatment process and leave the patient with the option of removable prosthesis. Within the limited resources, the incorporation of semi precision attachments in removable prosthesis provides for increased retention, improved aesthetics, comfort and masticatory

efficiency.⁹ The five year survival rate for removable prosthesis with precision attachment is upto 83.3 %.¹⁰ The RHEIN 83 OT CAP is a castable , extracoronal semi precision attachment system which was used in this case report. One of the major advantage for its use was the availability of adequate restorative space, stress breaker property, ease of use, low cost, clinical longevity and the ability of shaping the male part during the wax up for the FDP's . The female part consists of a nylon ring which was embedded in the CPD and allowed for easy chair side or in lab pick up.¹¹

The basic objective of oral rehabilitation is to allow the remaining mandibular muscles to provide stability to the denture base and an acceptable maxillo- mandibular relationship with good occlusal contacts.¹² Since no deviation of mandible was detected and adequate occlusal stops were present no guiding plane was inculcated in the prosthesis.

According to Adell et al implants are considered as the best treatment modality for craniofacial rehabilitation. However, they require substantial healing periods, graft acceptance and good financial support.¹³ Thus, more immediate and economical means of prosthetic rehabilitation are preferred by most patients as was the present case scenario.⁸

Conclusion:

Hemimandibulectomy and teeth loss at a young age has many psychological implications. It is the duty of the prosthodontist to restore the defect functionally and aesthetically as much as possible. The lack of financial support often leads to a delay in treatment and a compromise in the available treatment options. The technique used in this case report provided for a long term oral rehabilitation solution which is cost effective and functionally acceptable to the patient.

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