

Rehabilitation of hemimandibulectomy patient with tooth supported overdenture prosthesis with dual occlusion :

A Case Report

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Abstract

Rehabilitation of surgical defects after treatment of oral malignancies is a challenging procedure for any prosthodontist. Radiation therapy is a common treatment procedure for most of the patients of oral cancer after surgical resection. There is always a chance of failure of implant supported prosthesis in patients who have recently undergone radiation therapy. Loss of osseointegration and risk of osteoradionecrosis are two most common causes of failure. Continuity defects involving mandible cause difficulties in mastication, esthetics and to maintain optimum oral functions. This case report illustrates rehabilitation of a 50 year old patient who had undergone hemimandibulectomy and segmental maxillectomy due to squamous cell carcinoma. Post-operative radiation therapy was also given. Rehabilitation of upper arch was done using tooth supported overdenture prosthesis and

removable denture prosthesis given in lower arch. Dual occlusion occlusal scheme incorporated in prosthesis for upper arch to improve patient’s masticatory ability, so that mandible can close in its advantageous position. This simple and conservative approach proved to be a viable alternative to maintain oral functions in this patient.

Keywords: Dual occlusion prosthesis, Overdenture, Mandibular deviation.

Introduction

Oral malignancies due to smoking and other deleterious oral habits, genetic diseases are becoming one of the primary health concerns globally. Maintenance of quality of life (QoL) in those patients who have undergone resective procedures for treatment of malignant diseases is one of the main purposes of rehabilitation. Aggressive resective procedures and radiotherapy are the mainstay treatment procedures for most of the patients suffering

from oral cancer. Radiotherapy and resective procedures can lead to complications like trismus, mucosal inflammation, reduced salivary flow, deflective mouth opening etc. All these complications create obstacles for any rehabilitative procedures in these patients. Prosthetic treatment options for these patients range from tooth supported removable/fixed prosthesis to implant supported removable/fixed prosthesis. Dental implant is a modern treatment modality which created a new era in the field of dentistry. Various studies have shown that rehabilitation of edentulous patients with implant supported prosthesis improved their oral health-related quality of life.^[1] Predictability of implant supported prosthesis can be affected in patients who had undergone radiation therapy in recent times. The primary considerations in these patients are high risk of Osteoradionecrosis and less chance of Osseointegration.^[2] Complications arise due to damaging effect of radiation on osteoclasts, vascular system due to endarteritis and decreased collagen turnover rates in bone marrow.^[3] Prosthodontic prognosis is also influenced by mandibular movements and deviation.^[2] Patients who have undergone hemimandibulectomy usually show marked deviation of mandible towards resected site and angular path of closure. Angular path of closure in the frontal plane is known as Frontal plane rotation.^[3] Various treatment approaches like mandibular guidance prosthesis with buccal flange, intermaxillary fixation, dual occlusion prosthesis, palatal ramp prosthesis can be given to combat mandibular deviation. This case report presents a case rehabilitated with a tooth supported dual occlusion overdenture prosthesis for maxillary arch and removable prosthesis in mandibular arch in hemimandibulectomy patient.

Case Presentation

A 50 year old patient came in the unit of prosthodontics with chief complaints of inability to chew food and nasal

regurgitation of fluids. Patient had undergone hemimandibulectomy and segmental maxillectomy four months back due to squamous cell carcinoma in mandibular alveolar ridge on left side and left buccal mucosa. After surgical resection radiation therapy was given to the patient for two months. Extraoral examination revealed gross facial asymmetry and deviation of mandible towards the resected side. Intraoral examination showed remaining 23(carious) ,24 in upper arch and a mouth opening of 40mm interincisally (Figure-1). Mandibular arch was edentulous, with a class III configuration according Cantor & Curtis classification (Figure-2).^[4] An opening was found in palatal region which causes regurgitation of fluids. Implant supported prosthesis was not planned due to high chance of complications of implant in irradiated patients and due to economic reasons. After radiographic and clinical assessment tooth supported overdenture prosthesis in upper arch and removable denture in lower arch were planned. Primary impressions were made with irreversible hydrocolloid impression materials (Alginate, Zelgan 2002, Dentsply, India). Impressions were poured with type III gypsum products. Carious 23 was endodontically treated and restored with a post endodontic restoration (Figure-3). Tooth preparation of 24 and post-core restoration in 23 were prepared to use them as overdenture abutments (Figure-4). Customised tray were fabricated for both the arches with cold-cure acrylic resin (DPI Cold cure acrylic resin, Mumbai, India). After completion of border moulding final impression of upper arch made with polyvinyl siloxane impression material (addition silicone, Flexceed,GC Dental Products Corp., Japan) and impression of lower arch made with zinc-oxide eugenol impression paste (Figure-5). Impressions were poured with type IV gypsum products (type IV dental stone, Kalrock, Kalabhai Karson Pvt. Ltd, Mumbai, India) and

cast were obtained. Record bases were fabricated with cold cure acrylic resin(DPI Cold cure acrylic resin, Mumbai, India) and occlusal rims made with baseplate wax(Maarc, Shiva products, Maharashtra, India). Vertical dimension of rest and occlusion were checked with closest speaking space and phonetics. After guiding the mandible in its most advantageous position centric registration was done. Jaw relation of both the arches transferred to semiadjustable articulator(Hanau wide-vue -192 series). Two rows of teeth (Acry Rock acrylic teeth, Jodhpur, India) were set, first row of teeth were set in the ridge of the upper arch for esthetics and support for musculature and another row of posterior teeth were placed palatal to the first row. Maxillary record base was extended within physiological limits to cover the opening in palate. Mandibular teeth occluded with the second row of upper teeth. Occlusal equilibrations were performed to obtain degree of freedom in lateral movement. Arrangement verified in try-in stage and processing of dentures were done (Figure-6). Instructions were given to the patient and recalled in the next day and after one week (Figure-7). Subsequent follow-up visits showed improvement in masticatory efficiency and stoppage of nasal regurgitation of fluids.

Discussion

Support and stabilization of removable dentures are seems to be improved when natural tooth used as an abutments because of vertical and horizontal stability during functional loading.^[5] Tooth supported overdentures also show better proprioceptive response because of periodontal ligaments of remaining teeth. In this case report remaining natural teeth in the upper arch were used as abutments because of reduced available bone support due to resection. Reconstruction of mandibular and maxillary defects after resection is very important for any further rehabilitative procedure. Non-vascularised bone

graft(NVBG) and Vascularised bone flap(VBF) both techniques are well accepted for reconstruction of maxillary and mandibular defects.^[6] As no reconstructive procedures were performed in this patient, reduced prosthetic foundation area was available to fabricate any prosthesis. Post-operative scar contracture and fibrosis after radiation therapy also guarded the prognosis in this case. Deviation of mandible towards the resected side due to imbalance in muscle action and post-operative scar contracture is a common problem seen in hemimandibulectomy patients.^[2] Mandibular guidance prosthesis is usually applicable when there is less scar contracture and sufficient tooth support is available after mandibular resection.^[7] Dual occlusal scheme in maxillary prosthesis proves to be a good treatment option as patient can intercusate with the inner row of teeth. Outer row of teeth maintained cheek support and esthetics.^[8] Regular post-insertion follow up is very much important to check the improvement of masticatory efficiency and for post insertion adjustment procedures.

Figure 1: Pre-operative Intraoral view of Maxillary arch.



Figure 2: Pre-operative Intraoral view of Mandibular arch.



Figure 5: Final impression of both the arches.



Figure 3: Pattern for post-core restoration.



Figure 6: Upper removable prosthesis with dual occlusion and lower removable prosthesis.



Figure 4: Intraoral view after preparing abutments for overdenture.

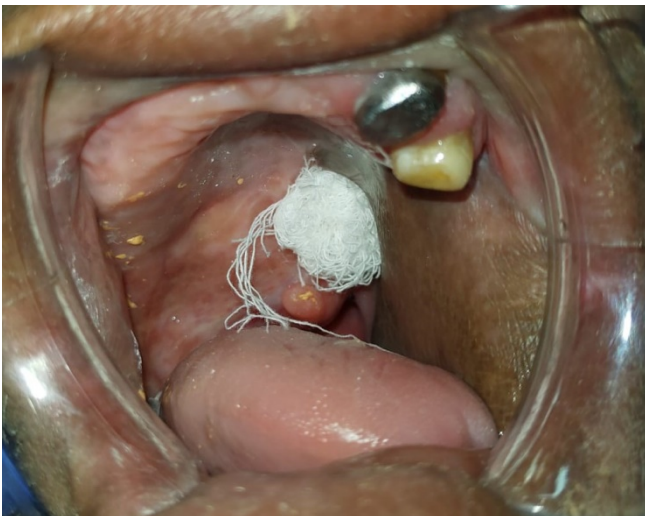


Figure 7: Post operative Extraoral view.



Conclusion

Patients who have undergone resective treatment procedures for oral malignancies are always difficult to rehabilitate. Post-operative complications and less psychological support also lowers the patients motivation to rehabilitation. Tooth supported overdenture is a viable alternative when there is less bony support available for any prosthetic procedure. This present article illustrates a tooth supported overdenture prosthesis with a dual occlusion occlusal scheme to maintain optimum oral health of a patient with deviation of mandible.

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