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GUIDING MANDIBLE BACK HOME: PROSTHETIC REHABILITATION: CASE REPORT

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ABSTRACT

Surgical resection of the mandible due to presence of benign or malignant tumour is the most common cause of the mandibular deviation. The resection can be total or segmental depending on the lesion. Loss of mandibular continuity results in deviation of the remaining mandibular segment towards the resected side, primarily because of the loss of tissue involved in the surgical resection. The success in rehabilitating a patient with hemimandibulectomy depends upon the nature and extent of the surgical defect, treatment plan, type of prosthesis, and patient co-operation. The earlier the mandibular guidance therapy is initiated in the course of treatment, the more successful is the patient's definitive occlusal relationship. Prosthodontic treatment coupled with an exercise program helps in reducing mandibular deviation and improving the masticatory efficiency. This case report describes an early prosthodontic management of a patient who has undergone hemimandibulectomy and was rehabilitated using provisional guide flange prosthesis followed by a definitive maxillary and mandibular cast partial denture with precision attachments that was designed to fulfil patient's needs.

KEYWORDS: Guide flange prosthesis, Hemimandibulectomy, Maxillofacial prosthesis, Rehabilitation.

INTRODUCTION

Odontogenic tumours of epithelial origin are usually seen in the posterior mandible and are often treated with surgical excision.[1] Cantor and Curtis have classified hemimandibulectomy for edentulous patients that can be applied in partially edentulous arches. Mandibular discontinuity due to hemimandibulectomy leads to one of the most common sequelae i.e; deviation of mandible to the resected side and other dysfunctions such as difficulty in mastication, swallowing, speech, mandibular movements, and even respiration.[2]

Mandibulectomy with radical neck dissection increases the probability of this deviation. This leads to facial disfigurement, loss of occlusal contact, loss of lip competency for saliva control and to initiate the swallowing process in many cases.[1] During the initial healing period prosthodontic intervention is required for preventing the mandibular deviation. Literature shows techniques to correct mandibular deviation that can vary from intermaxillary fixation with elastics to palatal or mandibular guiding flange prosthesis anchored on natural teeth or the denture flange.[2] The guide flange prosthesis is probably the simplest and most useful aid in maintaining the position of the remaining jaw.[3]

This case report describes an early prosthodontic management of a patient who has undergone hemimandibulectomy and was rehabilitated using provisional guide flange prosthesis followed by a definitive maxillary and mandibular cast partial denture with precision attachments that was designed to fulfil patient's needs and requirements.

CASE REPORT

A 58 year-old, female patient was referred to the Department of Prosthodontics from the Department of oral and maxillofacial surgery (KLE Dental College, Bengaluru) for correction of deviated mandible and deranged occlusion 2 weeks post-operatively. Upon eliciting the history, the patient had undergone hemimandibulectomy for squamous cell carcinoma of

left side of the mandible, distal to the lateral incisor upto left condyle and hence was classified under Cantor and Curtis classification-II. Clinical evaluation revealed restricted mouth opening of almost 20 mm, with gross asymmetry of the left side of face. There was a deviation of 15 mm of the mandible toward the left side from the midline. The region starting from the left lower bicuspid up to the left condyle was excised. Remaining dentition was sound with a total of 21 teeth present. Oral hygiene was poor with inflamed gingiva and the left buccal mucosa showed a satisfactory healing. Occlusion was completely deranged with the right lower cuspid occluding in between the upper central incisors (Fig1). Associated problems included difficulty in speech, swallowing and mastication, disfigurement of face.

Fig. 1(a) **Fig. 1(b)**

Fig. 1: a) Extraoral view showing deviated mandible to the left (resected side). b) Intraoral view showing midline shift to the left.

Treatment steps

1. Midline of the lower third of face was marked using an indelible pencil on both the maxilla and mandible and impressions were made using an elastomeric impression material (Fig.2).
2. Interocclusal bite registration material was used to record the patient's existing occlusion.
3. Casts were poured with Type III gypsum material and mounted on an articulator with the teeth in maximum intercuspation.
4. A 19-gauge stainless steel wire was adapted extending from the lingual surface of 45 and 46 interdentally extending occlusally upto the buccal surface of 15 and 16 forming a loop. An additional Adams clasp was made over the right mandibular molar to enhance retention.
5. Modeling wax was used to stabilize the wire.
6. A layer of separating medium was applied on the surface of the cast followed by addition of autopolymerizing resin (DPI clear; Dental Products of India, Mumbai) of sufficient thickness on the right maxillary buccal and mandibular lingual region. Care was taken to ensure that the material did not extend over the occlusal surfaces and that the articulator was closed with the casts in occlusion during the setting of the material.
7. Once the material was set, the prosthesis was removed, finished and polished before evaluating its fit in the patient's mouth(Fig.3).
8. The patient was then trained to insert the mandibular portion of the prosthesis and to slowly close as the extension of the prosthesis into the maxillary buccal region or the buccal flange guides the mandible into maxillary buccal region or the buccal flange guides the mandible in to complete occlusion. (Fig.4)
9. The midline was once again assessed to check that it coincides. (Fig.5)
10. Patient was instructed to wear the prosthesis for eight hours a day, removing it only while having food and during sleep.

Two months post insertion, the patient was able to effectively close her mandible into maximum intercuspation without the use of the guide flange (Fig.6).

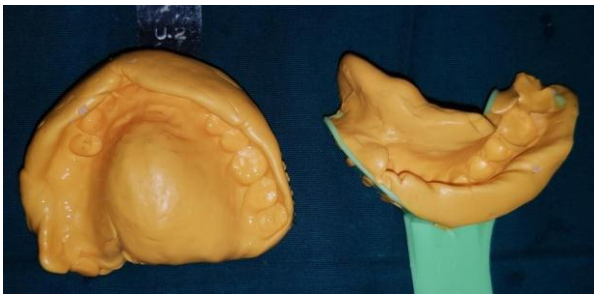

Fig. 2: Impressions.

Fig. 3: Guide flange prosthesis.

Fig. 4: Note the guiding flange on the maxillary right posterior teeth.

Fig. 5: Intraoral view, and note the correction of the deviation and midline.

Fig. 6(a)

Fig. 6(b)

Fig. 6: a) Extraoral view 2 months postoperative b) Note the occlusion and midline.

DISCUSSION

Depending upon the location and extent of the tumour in the mandible, various surgical treatment modalities like marginal, segmental, hemi, subtotal, or total mandibulectomy can be performed. Loss of mandibular continuity causes deviation of remaining mandibular segment(s) toward the defect and rotation of the mandibular occlusal plane inferiorly.[4] The usual result of the mandibular resection with disarticulation is a shift of the residual fragment to the resected side. This mandibular shift is due to the uncompensated influence of the contra-lateral musculature, particularly the internal pterygoid muscle. If this influence is left uncompensated, the contraction of the cicatricial tissue on the operated side will fix the residual fragment in its deviated position.[5] This situation leads to facial deformity and functional loss.

Though fabrication of definitve prosthesis is the final solution for replacing the missing teeth for reconstructed mandibulectomy patients, the clinicians must wait for extensive period of time for completion of healing and acceptance of the osseous graft. During this initial healing period early prosthodontic intervention by mandibular guide flange and maxillary stabilization prosthesis serve the purpose of reducing the mandibular deviation, preventing extrusion of the maxillary teeth and improving the masticatory efficiency. Our principal aim was to maintain her aesthetics during mandibular movements. Hence the guide flange prosthesis was fabricated in clear acrylic resin and the retentive wire components were kept distal to the mandibular canine to minimize the prosthesis display. A vertical extension from the buccal aspect of a mandibular prosthesis extends to contact the buccal surface of the opposing maxillary teeth. This extension maintains the mandible in the proper mediolateral position for vertical chewing, but little, if any, lateral movement is possible.

This clinical report illustrates the prosthetic management of a patient who underwent mandibular resection due to surgery for squamous cell carcinoma. Adell *et* al,[6] have carried out a retrospective evaluation to evaluate the possibility of providing every patient with dental rehabilitation after segmental resections and primary jaw reconstructions. Osseointegrated implants are the more recent and advanced treatment modality for craniofacial reconstruction. However, they require extensive period for healing and acceptance of graft and are expensive. Thus, more immediate and economical means of prosthetic rehabilitation are preferred by most patients. The literature shows various types of cast metal guidance

prostheses which are effective in managing the mandibular deviation.[7] But such appliances are complex, the technique is sensitive and costly and they require a number of patient visits. The acrylic guide flange prosthesis which is presented here is a simple and cost effective method for managing the mandibular deviation. The number of patient visits is also less as compared to the cast metal guidance prosthesis. The other advantage is it's ease of adjustability.

The success of mandibular guidance therapy depends on the early beginning, the nature of the surgical defect and the patient's cooperation. Mandibular guidance therapy begins when the immediate postsurgical sequelae have subsided, usually within 2 to 3 weeks after surgery. This sort of therapy is most successful in patients whose resection involves only bone structures and minimally the tongue, the floor of the mouth and contiguous soft tissues. The presence of the teeth in both the arches is important for the effective guidance and the reprogramming of the mandibular movements. The patient in this clinical report retained all her teeth, except those on the defect site. Therefore, the patient had a better proprioceptive sense and was able to achieve the functional position after the insertion of the prosthesis.

The main purpose is to re-educate the mandibular muscles to re-establish an acceptable occlusal relationship (physiotherapeutic function) for the residual hemimandible, so that the patient can control the opening and closing of the mandibular movements adequately and repeatedly. This is the beginning of an accomplished prosthetic rehabilitation by using a removable prosthesis, by which artificial teeth could warrant a stable occlusion. For better results, the prosthetic management can be combined with an exercise program that can be started 2 weeks after the surgery. On opening completely, the mandible can be displaced by hand as forcefully as possible towards the nonsurgical side. These movements tend to lessen scar contracture, reduce trismus, and improve maxillomandibular relationships.

CONCLUSION

The prognosis of the prosthesis in functional rehabilitation of hemimandibulectomy patient who has undergone resection without reconstruction is guarded. Guide flange prosthesis is most common treatment modality. However, in cases where sufficient numbers of abutment teeth are not present and where deviation is massive, providing twin occlusion rehabilitates the patient functionally. Surgical reconstruction by implants and grafts of various types is the ideal treatment when feasible. However, it is not always feasible in every patient, alternative prosthodontic approach has to be considered to restore the esthetics and function in such subject.

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