

## CASE REPORT

# PROSTHODONTIC MANAGEMENT OF MANDIBULAR DEVIATION USING PALATAL RAMP APPLIANCE

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### ABSTRACT

Segmental resection of the mandible commonly results in deviation of the mandible to the defective side. This loss of continuity of the mandible destroys the balance of the lower face and leads to decreased mandibular function by deviation of the residual segment toward the surgical site. Prosthetic methods advocated to reduce or eliminate mandibular deviation include intermaxillary fixation, removable mandibular guide flange, palatal ramp, implant-supported prosthesis with palatal guidance restorations which may be useful in reducing mandibular deviation and improving masticatory performance and efficiency. These methods and restorations would be combined with a well organized mandibular exercise regimen. This clinical report describes the rehabilitation following segmental mandibulectomy using palatal ramp prosthesis.

J Odontol Res 2014;2(2):55-8.

## INTRODUCTION

Segmental resection of the mandible results in special physiological and esthetic problems, especially if condylectomy has been performed. The most significant difficulty in esthetics is encountered with mandibular deviation towards the defective side when condylectomy has been performed<sup>1</sup>. The earlier that mandibular guidance therapy is initiated in the course of treatment, the more successful the patient's definitive occlusal relationship and masticatory efficiency. Any delays in the initiation of mandibular guidance appliance therapy, due to problems such as extensive tissue loss, radiation therapy, radical neck dissection, flap necrosis, and other post surgical morbidities, may result in an inability to achieve normal maxillomandibular relationships<sup>2,3</sup>. Intermaxillary fixation, mandibular-based guidance restorations, and palatal based guidance restorations will reduce or minimize this mandibular deviation.

A well organized mandibular exercise program should always accompany these methods. Any uncoordinated masticatory movements may result in dental or soft tissue trauma, including severe lip or tongue lacerations and hemorrhage<sup>4</sup>. So, monitoring the lesion, smoothing sharp teeth, using oral appliances, extracting problematic teeth, or inhibiting behaviors such as self-mutilation of lips, cheeks, and tongue are the best solutions for such soft tissue trauma. This article describes the fabrication of palatal ramp type guidance appliance for a patient following a segmental mandibulectomy.

### Case Report

A 9-year-old male patient was referred to the Department of Prosthodontics for rehabilitation following resection of the right mandible (Figure 1). The patient's history indicated that 3 years back, he was surgically treated for the Pindborg tumor on right mandibular molar region. TMJ examination revealed severe deviation of the mandible towards the resected site (Figure 2). Based on the clinical situation, a palatal ramp type guidance appliance was

planned (Figure 3). It was noted that the patient lacks motor control to bring the mandible into centric occlusion. Definitive impressions were made with addition of polysilicone (Coltene Whaledent, Switzerland). Definitive casts were poured with type IV dental stone (Kalrock, Kalabhai Karson Pvt. Ltd., Mumbai, India). Over the maxillary cast a simple retainer type of appliance was made. The retainer was checked for adaptation in oral cavity. After this auto polymerizing acrylic resin was added to this retention plate on the left side and as acrylic resin reached doughy stage, mandible was manipulated to the desired interocclusal relationship. This movement was repeated several times. The resin was manipulated to extend 7-10 mm superiorly. After this prosthesis was removed from the mouth and resin was allowed to polymerize. The appliance was finished, evaluated, and adjusted intraorally. It was noted that the patient was able to achieve a functional intercuspal position immediately after insertion of the prosthesis. The prosthesis was removed from the mouth. The prosthesis was repolished and inserted (Figure 4). The patient was given routine post insertion instructions and was motivated to make efforts to learn to adapt to the new prosthesis. Simple exercises were suggested to the patient that helped the patient learn to manipulate the mandible into the proper position.

## DISCUSSION

Successful rehabilitation of edentulous mandibulectomy patients is more difficult than that of a dentulous patient. Sharry<sup>5</sup> described the difficulties encountered as:

- Limited coverage and retention.

- Grossly impaired relation of the mandible to the maxilla.

- Limited movement of the mandible.

- Loss of facial structures and sensory and motor innervation complicates the control factors.

Mandibular treatment prosthesis is very helpful in reducing the unavoidable sequelae resulting from



Fig 1  
Extraoral view of patient showing marked mandibular deviation towards right side.



Fig 2  
Intraoral view showing mandibular deviation.



Fig 3  
Palatal ramp prosthesis.



Fig 4 &5  
Palatal ramp prosthesis in patient's mouth.



Fig 5  
Palatal ramp prosthesis in patient's mouth.



Fig 6  
Post insertion extraordinary view

extensive mandibular resection like muscular contraction, mutilation of occlusal plane, scar contracture, etc. Its success varies and depends upon the nature, size and site of the surgical defect, initiation of the guidance therapy, patient's expectation, cooperation and other factors. Modification to these principles are determined on an evidence basis and greatly influenced by unique residual tissue characteristics and dynamics and science of mandibular movement<sup>6</sup>. This flange engages the mandibular teeth during mandibular closure, thereby directing the mandible into an appropriate intercuspal position. Earlier the mandibular guidance therapy is initiated in the course of treatment, more successful the patient's definitive occlusal relationship. Mandibular guidance therapy begins when immediate post surgical sequelae have subsided, usually two weeks after surgery. Various other methods advocated to reduce or eliminate mandibular deviation include mandibular guidance therapy, intermaxillary fixation, resection guidance restorations, splinting, and fabrication of prosthesis similar to 'swing lock' removable partial dentures. For best results, these methods and restorations would be combined with a well-organized mandibular exercise regimen. An implant-supported fixed prosthesis can be an optional treatment modality for functional and esthetic rehabilitation. The use of resection guidance restoration is predicted on the basis of presence of maxillary and mandibular teeth, as teeth presence in both arches is important for effective guidance and reprogramming of mandibular movement. For the patient, this prosthesis provided comfort and sufficient function, and he was able to achieve functional intercuspal position immediately after the insertion of the prosthesis. A removable prosthesis is an equally effective alternative for most patients with mandibular defects, considering the poor prognosis, difficulty in decision making for use of implant, and economic feasibility.

### CONCLUSION

Certain basic principles of construction of conventional dentures should be modified for mandibular resection patients because of many restrictive physical factors. The philosophical approach to the treat-

ment and rehabilitation of such patients with resected mandibles is not in concentrating on what has been sacrificed in the eradication of the disease, but rather in taking full advantage of the remaining structures. This clinical report describes the prosthetic rehabilitation following segmental mandibulectomy with palatal ramp type guidance appliance and the patient expressed satisfaction with the esthetic outcome.

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