Rehabilitating Mandibular Resection with Guide Flange Prosthesis
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ABSTRACT
Loss of continuity of the mandible leads to deviation of the residual segment towards the surgical site and alteration in muscle function. This results in facial asymmetry and malocclusion. A corrective device known as ‘guide flange prosthesis’ is indicated to limit this clinical manifestation. Guide flange prosthesis serves as a training device. It can successfully guide the patient to close the mandible into the correct intercuspal position. This clinical report reveals the rehabilitation of patient who underwent hemisection of the mandible, subsequent to treatment for an ameloblastoma. He was successfully rehabilitated with mandibular guide flange prosthesis.

Key Words: Mandibular deviation. Mandibular guide flange prosthesis. Hemimandibulectomy.

INTRODUCTION
Surgical treatment for neoplastic lesions of the oral cavity often requires resection involving the mandible, floor of the mouth, tongue and also the palate.1,2 Loss of mandibular continuity in consequence of surgical treatment leads to mandibular deviation and altered muscle function. It clinically results in facial asymmetry and malocclusion.3 The residual mandible deviates medially and superiorly. The extent of deviation depends on the location and extension of the resection, the amount of soft tissue and innervations involvement and the presence of remaining natural teeth.3,4

A corrective device known as ‘guide flange prosthesis’ is indicated to limit that clinical manifestation. It can be applied either immediately postoperatively as intermaxillary fixation or within 7 - 10 days after the resection as removable device, for restoring mandibular function.4,5 The earlier the guidance therapy is initiated in the course of treatment, the more successful is the patient's definitive occlusal relationship.1 Delays in the initiation due to extensive tissue loss, tight wound closure and other postsurgical morbidities, may result in an inability to achieve normal maxilla-mandibular relationships. It has been reported that fabrication of a provisional guide plane facilitates the fabrication of a definitive restoration.6

Uncoordinated masticatory movements due to deviated path of closure may result in eccentric occlusion, a disoriented masticatory cycle, facial disfigurement, distorted speech, dental or soft tissue trauma.7

This report describes the fabrication of palatal guide flange prostheses for a patient following a hemi-mandibulectomy.

CASE REPORT
A 49 years male patient reported to the Department of Prosthodontics with complaint of difficulty in mastication and speech. He had a unilateral discontinuity mandibular defect on left side due to surgery for ameloblastoma. The surgery was performed 2 months back and reconstruction was done with pectoralis major myocutaneous muscle graft. No intermaxillary fixation was applied at the time of surgery, resulting in marked mandibular deviation.

Extraoral examination showed facial asymmetry. Clinical examination revealed severe deviation of the mandible towards the left side, with lack of proper contact between maxillary and mandibular teeth. Intra oral examination showed missing teeth 17, 31, 32, 33, 34, 35, 36, 37 and 41 (Figure 1). The mandibular defect was classified as Cantor and Curtis Class III i.e. resection defect involves loss up to the mandibular midline region.8 The tissue bed in the edentulous area was restored with pectoralis major myocutaneous muscle flap, which was easily displaceable and quite yielding. The denture foundation was not ideal for support.

The patient was evaluated for the guide flange prosthesis. It was noted that the patient's mandible could be manually manipulated into the centric occlusion without excessive force. As the patient suffered severe mandible deviation, therefore, palatal based guidance prosthesis was fabricated as a training appliance. A maxillary and mandibular impression was made by using irreversible hydrocolloid (Zelgan, Dentsply India Pvt. Ltd., Delhi, India). The casts were poured with Type-III gypsum product (Kalabhai Karson Pvt. Ltd., Mumbai, India). A maxilla-mandibular record was made by manually assisting the mandible into the centric occlusion. The maxillary and mandibular cast were mounted on a semi-adjustable articulator.
The palatal based guide flange prosthesis was fabricated on the non-defect (right) side. The retention was provided by the interdental clasps, engaging the maxillary premolars and the molars. A palatal acrylic (Trevalon Rapid Repair, Dentsply Pvt. Ltd., Gurgaon, India) flange of sufficient length was attached on the unaffected side to serve as a guiding plane. The size and shape of the flange was determined by the degree of deviation of the mandible. The guide flange extended inferiorly and diagonally on the lingual surface of the mandibular molars and the premolars, allowing the normal horizontal and vertical overlap of the left maxillary teeth. The guide flange was sufficiently blocked out, so that it would not traumatize the maxillary teeth and the gingiva when the patient closed his mouth. Initially the mandible was manipulated by guiding and moving it away from the surgical site. Acrylic resin was added little by little to the guiding plane of the flange so that the mandible could be guided to a correct occlusal position. The prosthesis was finished, evaluated and inserted intraorally (Figure 2A).

The patient was advised to use the guide flange device throughout the day, except at night and during meals. He was also instructed to perform simple physiotherapy exercises. The patient was recalled after 3 weeks for follow-up. Definitive partial denture restorations were deferred until an acceptable maxilla-mandibular relationship is obtained or an end point in mandibular guidance therapy is reached.

**DISCUSSION**

The success of mandibular guidance therapy varies and depends upon the nature of the surgical defect, early initiation of guidance therapy, patient co-operation, and other factors. This therapy is most successful in patients for whom the resection involves only bony structures, with minimal sacrifice of tongue, floor of the mouth, and adjacent soft tissues, so the patients treated for ameloblastoma are ideal candidates for the use of a mandibular guidance therapy.

Rehabilitation is an essential phase of cancer care and should be considered from the time of diagnosis in a complete and comprehensive treatment plan. The primary objective is restoration of function and appearance. Prosthetic methods, including intermaxillary fixation, mandibular-based guidance restorations, and palatal-based guidance restorations minimize mandibular deviation.

The most important objective is to re-educate the mandibular muscles to re-establish an acceptable occlusal relationship (physiotherapeutic function) for residual hemimandible, so that the patient could control adequately and repeatedly opening and closing mandibular movements. The guide flange provided a mechanical system which prevented the mandible from turning towards the resected side. For better results, prosthetic management can be combined with an exercise program, which can be started 2 weeks after surgery. The patient's chin and mandible moves away from the surgical side. The exercise consisted of the simple opening and closing of the mandible with and without the appliance. Another efficacious exercise is chewing gum. On opening completely, the mandible can be displaced by hand as forcefully as possible towards the non-surgical side. These movements lessen scar contracture, reduce trismus, and reprogramme the remaining musculature to close the mandible into the centric occlusion.

The presence of teeth in both the arches is important for effective guidance and reprogramming of mandibular movements. The patient in this clinical report retained all his teeth, except those on the defect site. Therefore, the patient had a better proprioceptive sense and was able to achieve the functional position after insertion of prosthesis.

Guidance prosthesis served as a training appliance till a cast partial denture can be fabricated for the patient. Within 3 weeks, the mandible was guided to the correct occlusal position. This prosthesis helped the patient to get accustomed to close the mandible into the correct intercuspal position without the use of any external aid (Figure 2B).

The literature shows various types of cast metal guidance prostheses which are effective in managing the mandibular deviation. But such appliances are complex; the technique is sensitive and costly and requires many patient visits. The acrylic guide flange prosthesis presented here is 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 its ease of adjustability.

REFERENCES