

## A DEFINITIVE MANDIBULAR GUIDE FLANGE PROSTHESIS FOLLOWING HEMIMANDIBULECTOMY: A CLINICAL REPORT

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### ABSTRACT

Loss of continuity of the mandible destroys the balance and symmetry of mandibular function, leading to altered mandibular movements, disfigurement, difficult in swallowing, impaired speech and articulation and deviation of the residual fragment towards the surgical side. Upon opening the mouth, this deviation increases, leading to the opening and closing in the angular pathway. A corrective device named "Guide Flange Prosthesis" is indicated to limit that clinical manifestation. A new possibility for treating hemimandibulectomy patients is using an only one device both for Physiotherapy and Mastication.

**KEYWORDS:** Flange prosthesis; Mandibular defects; Mandibular resection; Refractory cast

### INTRODUCTION

Neoplasms which are associated directly or indirectly with the mandible usually require surgical removal of the lesion and extensive resection of the bone.<sup>[1,2]</sup> Loss of the proprioceptive sense of occlusion following hemimandibulectomy leads to the uncoordinated, less precise movements of the mandible.<sup>[3]</sup> The basic rehabilitation objective is to re-educate mandibular muscles to re-establish an acceptable occlusal relationship (physio-therapeutic function) for residual mandible, so that patient could control adequately and repeatedly opening and closing mandibular movements.<sup>[4]</sup>

**Cantor and Curtis have classified the mandibular defects into 6 categories .<sup>[5]</sup>**

Class I: Mandibular resection involving alveolar defect with preservation of mandibular continuity (Fig. 1a).

Class II: Resection defects involve loss of mandibular continuity distal to the canine area (Fig. 1b).

Class III: Resection defect involves loss up to the mandibular midline region (Fig. 1c)

Class IV: Resection defect involves the lateral aspect of the mandible, but are augmented to maintain pseudoarticulation of bone and soft tissues in the region of the ascending ramus (Fig. 1d).

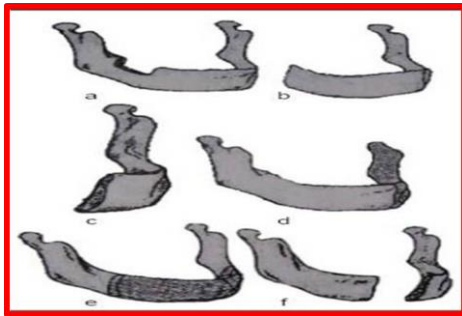
Class V: Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations (Fig. 1e).

Class VI: Similar to class V, except that the mandibular continuity is not restored (Fig. 1f).<sup>[6]</sup>

Numerous prosthetic methods can be employed to reduce or minimize deviation and improve functions such as Maxillo-mandibular fixation, Implant supported prosthesis, Removable mandibular guide flange prosthesis and palatal based guidance restoration.<sup>[6,7]</sup>

### CASE REPORT

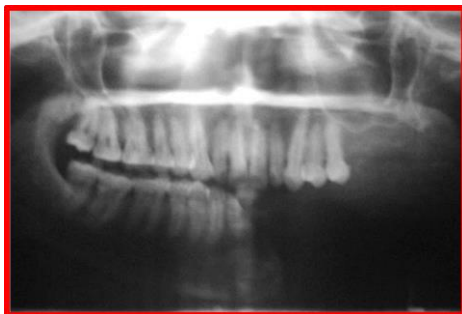
A female patient, 36 years of age, visited the Department of prosthodontics, peoples college of dental sciences and research centre, Bhopal. The chief complaint was the unaesthetic appearance because of hemimandibulectomy, 2 years back due to squamous cell carcinoma. Intra oral examination revealed a complete absence of mandibular left segment. The defect crossed the midline and hence could be classified as Cantor and Curtis classification-III (Fig. 2a & Fig. 2 b). An interim removable partial denture followed by a definitive cast partial denture with a guiding flange appliance was planned for this patient. For the interim prosthesis primary impression was made in alginate, followed by a dual arch impression for final cast (Fig. 3a). Jaw relation was recorded (Fig. 3b). Teeth arrangement and try in was done (Fig. 3c) and the interim prosthesis was delivered after application of tissue conditioner to the intaglio surface (Fig. 3d & Fig. 3e). For the definitive prosthesis the diagnostic cast was surveyed (Fig. 4a). Mouth preparation



**Fig. 1:** Cantor and Curtis Classification of Mandibular Defects



**Fig. 2a:** Intra Oral View of Defect



**Fig. 2b:** OPG Showing the Defect



**Fig. 3a:** Dual Impression



**Fig. 3b:** Jaw Relation



**Fig. 3c:** Try In



**Fig. 3d:** Interim Prosthesis



**Fig. 3e:** Interim Prosthesis



**Fig. 3d:** Interim Prosthesis



**Fig. 3e:** Interim Prosthesis





**Fig. 4a:** Surveying the Diagnostic Cast



**Fig. 4b:** Elastomeric Impression



**Fig. 4c:** Blockout of Master cast



**Fig. 4b:** Refractory Cast



**Fig. 4e:** Pre Heating of the Cast



**Fig. 4b:** Wax Pattern Adaptation with, Metal Bar for Guide Flange Attachment



**Fig. 4f:** Wax Pattern Adaptation with, Metal Bar for Guide Flange Attachment



**Fig. 4g:** Finished metal framework



**Fig. 4g:** Finished metal framework



**Fig. 4h:** Record base with double spacer



**Fig. 4i:** Impression with Tissue Conditioner



**Fig. 4j:** Impression with Light body



**Fig. 4k:** Sectioned Master cast



**Fig. 4l:** Checking the Adaptation



**Fig. 4m:** Serrations for Better Interlocking



**Fig. 4n:** Altered Cast



**Fig. 4o:** Neutral Zone Recorded



**Fig. 4p:** Try-In



**Fig. 4q:** Articulation of Maxillary and Mandibular Casts



**Fig. 4r:** Guide Flange Prosthesis





**Fig. 4s:** Final Prosthesis in place



**Fig. 4t:** Comparison of patient face with Pre and Post Treatment

was done. Final impression was made in light body and the master cast was poured (Fig. 4b). Block out of the master cast was done (Fig. 4c). The master cast was duplicated in agar and refractory cast was poured (Fig. 4d). Preheating of the cast was done in the furnace (Fig. 4e). The preheated refractory cast was soaked in molten bees wax for strengthening. The preheated refractory cast was soaked in molten bees wax for strengthening. On the refractory cast the wax pattern was adapted. A metal bar was attached to the pattern for the attachment of the guiding flange (Fig. 4f). The sprues were attached, pattern was invested and casting was done. Once the casting was retrieved, it was finished and polished (Fig. 4g). To obtain the altered cast a record base was made on the minor connector with the double spacer (Fig. 4h). The final impression of the edentulous, resected, soft tissue region was taken by tissue conditioner (Fig. 4i). Over the tissue conditioner a light body wash was taken (Fig. 4j). The master cast was sectioned (Fig. 4k). The fit of the prosthesis was rechecked (Fig. 4l). For better interlocking of the two sections serrations were made on the cast (Fig. 4m). An altered cast was made (Fig. 4n). This cast was duplicated and a permanent record base was made. Jaw relation was recorded. Neutral zone was recorded to enhance stability (Fig. 4o). Teeth arrangement and try in was done (Fig. 4p). The maxillary cast

was placed on the mandibular cast (Fig. 4q). For the fabrication of the guiding flange, wax extension was made on the maxillary molars (Fig. 4r). The complete assembly was cured. Final prosthesis was delivered (Fig. 4s). Marked improvement was noted in esthetics of the patient (Fig. 4t).

#### DISCUSSION

This clinical report illustrates the prosthetic management of a patient who underwent mandibular resection. The earlier the mandibular guidance therapy is initiated in the course of treatment the more successful the patients definitive occlusal relationship is restored.<sup>[1]</sup> The basic rehabilitation objective in this case was to re-educate mandibular muscles to re-establish an acceptable occlusal relationship (physio-therapeutic function) for residual mandible and to restore the mastication.<sup>[8]</sup> It also aided by controlling adequate and repeated opening and closing mandibular movements.<sup>[9]</sup> The most common treatment modalities for such patients are maxilla mandibular fixation, implant supported prosthesis, removable mandibular guide flange prosthesis and palatal based guidance restorations. An implant supported prosthesis was not considered since no bone graft was used.<sup>[6]</sup> The mandibular guide flange device for hemimandibulectomy patients presenting good natural teeth on the residual mandible fits

generally over that teeth (base-plate) and has a guide plane (flange splint) extending into the maxillary buccal vestibule, and which rides on the buccal surfaces of several of the maxillary teeth: this is the mechanical system preventing the mandible from turning toward the resected side.<sup>[6,9]</sup> Every patient should maintain centric occlusion for mastication, and this may be accomplished by a guide plane.<sup>[10]</sup> Using only one prosthetic device as that proposed in this work permits patients by guide flange to re-educate mandibular muscles and removing the same structure to eat. In this way patients are not obliged to use one device for the physiotherapeutic step and a second different device to eat. The prosthetic device proposed was easy to make and repair, comfortable to wear, also without guide flange inserted, easy to clean and functional for patient's disease so that expected results are obtained.<sup>[4]</sup>

#### CONCLUSION

This sort of device permits the use the same prosthesis both for eating and for mechanical correction of mandibular deviation. A common feature among all removable resection prosthesis is that all framework designs should be dictated by basic prosthodontic designs such as Broad stress distribution, Cross arch stabilization. A Rigid major connector stabilizing and retaining components at locations within the arch to minimize dislodgement and replacement of tooth position that optimize prosthesis.

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