**Pacific Journal of Medical and Health Sciences**
ISSN: 2456-7450 | July to Sept 2025 Issue (Volume 1, Issue 3), pp - 45 - 56

PJMHS
PACIFIC JOURNAL OF MEDICAL AND HEALTH SCIENCES

**Case Report**

# Rehabilitation of Hemimandibulectomy Patient with Class II Cantor-Curtis Defect Using Modified Guiding Flange and Palatal Ramp Prosthesis: A Clinical Report

**Pranchal Bhargava[1]*, Vivek Sharma[2], Ravi Kumar CM[3] and Manhit Singh[4]**

[1]Post Graduate Resident, [2]Professor, [3]Professor and Head, [4]Senior Reader

Department of Prosthodontics,
Pacific Dental College and Research Center, Udaipur, Rajasthan, Bharat

***Corresponding Author Email:** bhargavapranchal@gmail.com

## ABSTRACT

*Loss of mandibular continuity after segmental resection often results in mandibular deviation, facial asymmetry, and impaired oral function. Although immediate reconstruction with vascularized fibula free flaps restores continuity, masticatory function may remain compromised. This case report describes early prosthodontic rehabilitation of a hemimandibulectomy patient having class II Cantor-curtis mandibular defect using modified guide flange prosthesis and a palatal ramp to assist mandibular guidance and function.*

**KEYWORDS**: Oral squamous cell carcinoma, Hemi-mandibulectomy, Guide flange prosthesis, Palatal ramplasty

## INTRODUCTION

Segmental mandibulectomy is a common treatment for oral squamous cell carcinoma (OSCC) involving the mandible[1,2]. Resection leads to deviation of the residual mandibular segment, compromised occlusion, and masticatory dysfunction due to muscular imbalance and loss of skeletal continuity. Cantor and Curtis have classified the mandibular defects into 6 categories:

Class I: Mandibular resection involving alveolar defect with preservation of mandibular continuity;

Class II: Resection defects involve loss of mandibular continuity distal to the canine area;

Class III: Resection defect involves loss up to the mandibular midline region;

Class IV: Resection defect involves the lateral aspect of the mandible, but is augmented to maintain pseudo articulation of the bone and soft tissues in the region of the ascending ramus;

Class V: Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations;

Class VI: Similar to class V, except that the mandibular continuity is not restored.

Although vascularized free fibula flap (FFF) reconstruction provides excellent anatomical replacement, functional outcomes vary[3,4]. FFF reconstruction provides excellent anatomical replacement, functional outcomes vary. Early prosthodontic management can play a pivotal role in retraining mandibular movements and minimizing deviation during the healing phase in retraining mandibular movements and minimizing deviation during the healing phase[5].

**Patient Information**

A 51-year-old male came to OPD of Department of Prosthodontics, Pacific Dental College and Research Center, Udaipur, Rajasthan with a chief complaint of inability in chewing and deviation of jaws for 6 months [Figures 1,2 and 3].

**Figure 1**: Deviation of Mandible in Frontal View

**Figure 2**: Deviation of Mandible to the Defect Side (Left Side)


**Figure 3**: Extra-oral Profile Post-operative before the Prosthesis
(a - Frontal View, b - Lateral Left Profile, c - Lateral Right Profile)

As stated by patient he was apparently asymptomatic 2 years back (2023), when he noticed oral ulcers on left buccal mucosa and went for biopsy, when ulcers didn't respond to the given medication. Biopsy turned out to be normal in that year, but later in August 2024 there was sinus formation on the left cheek. This time histopathological examination of biopsy confirmed Oral Squamous Cell Carcinoma of left buccal mucosa. Patient was operated in September 2024 and underwent segmental hemi-mandibulectomy from left condyle to parasymphyseal region with modified neck dissection involving lymph nodes level I to V and an immediate flap reconstruction was done at one of the Medical Colleges in Udaipur, Rajasthan. He underwent radiotherapy after a month of surgery and received 30 doses till December 2024. Following the surgery he developed class II Canton-Curtis defect on left side with mandibular deviation, restricted mandibular movements and aesthetically evident facial asymmetry.

Patient was a known case of diabetes mellitus for past 6 months and is under medication for the same.

**Past Surgical History**: Segmental Hemi-mandibulectomy (left side from condyle to parasymphyseal region), Modified Neck Dissection (level I to level V), Immediate Flap Reconstruction.

**Personal History**: There was history of smoking and chewing tobacco for past 10 years. Patient is on cessation for 2 years.

On Intra-oral examination, it was revealed that patient's mouth opening was reduced to 30mm.

Teeth present were

| 8-1 | 1-4 |
|---|---|
| 8-1 | 1-4 |

Root stump

| 7 | |
|---|---|
| | |

Carious

| 8 | |
|---|---|
| | |

Xerostomia and mucositis were observed in the oral cavity.

With stains +, Calculus ++

**Clinical and Radiographic Findings**

Extra-oral examination revealed mandibular deviation toward the left with associated facial asymmetry. Intra-oral examination showed surgical scarring, limited vestibular depth on the left, and a reconstructed mandibular segment. Panoramic radiographs revealed osseous discontinuity defect [Figure 4].

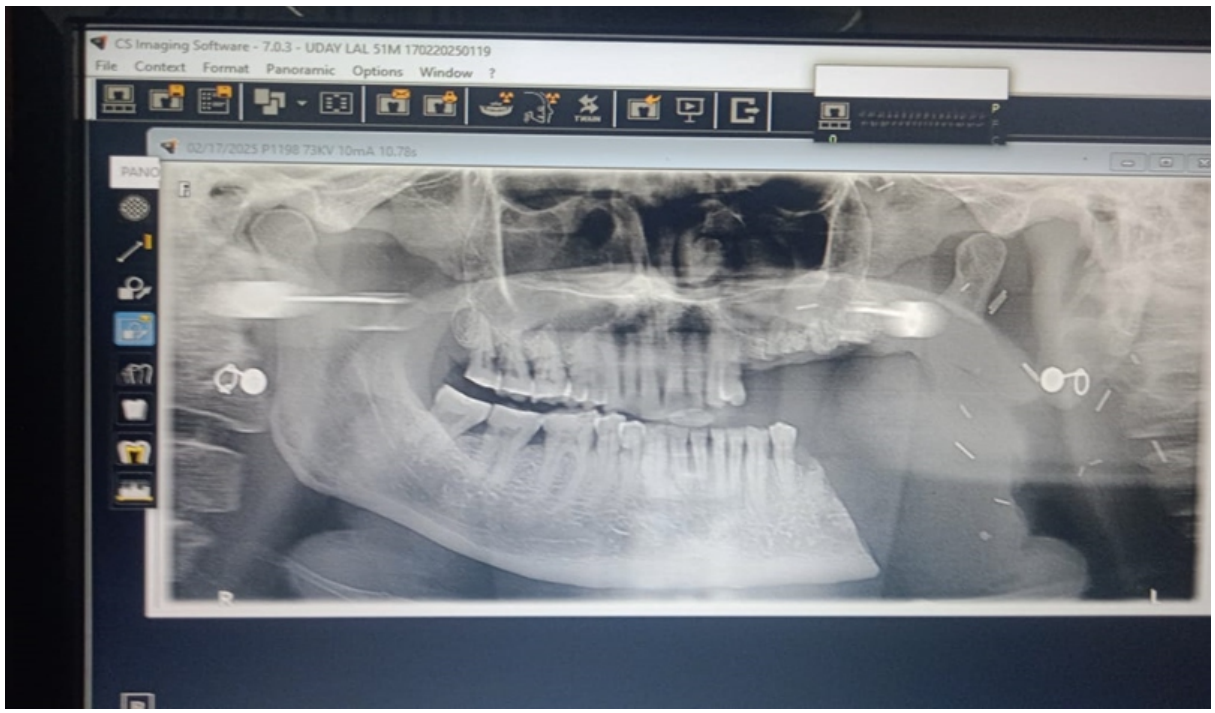


**Figure 4**: Post-op Radiograph of Hemi-mandibulectomy

**Prosthodontic Management**

Prosthodontic rehabilitation was planned during the initial healing phase to improve mandibular function and prevent maladaptive muscle patterns.

1. Guide Flange Prosthesis (GFP): A modified GFP was fabricated in clear cold-cure acrylic resin to guide the deviated mandible into proper mediolateral occlusion. Buccal extensions were shaped to engage the maxillary dentition and provide gliding contact during closure [Figure 5].

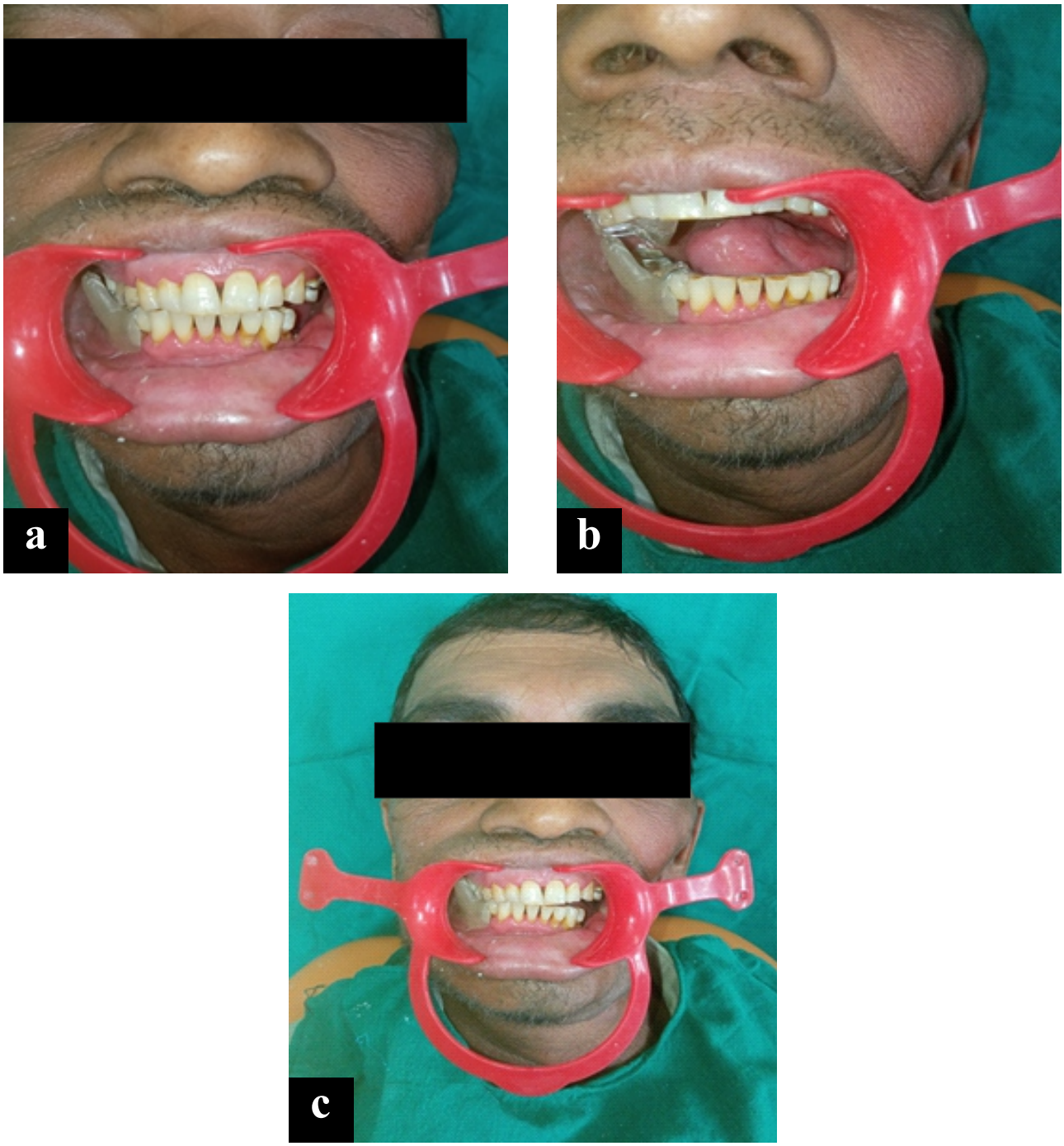


**Figure 5**: Placement of Buccal Guiding Flange Appliance which Assists and Guides the Mandible to its Original Position (a - Frontal View, b - Frontal View with Open Mouth, c - Frontal View with Close Mouth)

1. Palatal Ramp: A palatal ramp was fabricated on the maxillary prosthesis using cold-cured acrylic to provide vertical and lateral guidance to the mandible. This addition helped in redirecting the mandible during closure, prevented maxillary tooth extrusion, and enhanced functional efficiency [Figure 6].

**Treatment Outcome**

The patient reported a noticeable improvement in chewing ability, mandibular control, psychological well-being and speech clarity. Facial symmetry improved, and deviation on mouth opening was significantly reduced. Regular follow-up visits confirmed continued adaptation and favorable response.

## DISCUSSION

Loss of mandibular continuity results in deviation due to the unopposed action of contralateral muscles and soft tissue contraction due to the unopposed action of contralateral muscles and soft tissue contraction[1,6]. Segmental resection leads to rotation of the occlusal plane and a shift in the midline, making functional rehabilitation complex. Although fibula flap reconstruction reestablishes form and continuity, studies indicate that masticatory function remains impaired in over 50% of cases, even after reconstruction[4,7].A review by Komisar found that only 4% of mandibular reconstruction patients had documented functional outcomes, and just 2% received prosthetic rehabilitation[5].

Patil et al. emphasized early prosthetic intervention using guide flange prostheses to retrain the mandible and reduce deviation[6]using guide flange prostheses to retrain the mandible and reduce deviation. In their case, a modified Guiding Flange Prosthesis and Palatal Ramp (maxillary stabilization plate) helped guide the mandible into consistent occlusion. Our approach extends this concept by combining a guiding flange prosthesis with a palatal ramp, offering multidirectional guidance and enhancing vertical closure[5,8] by combining a Guiding Flange Prosthesis with a palatal ramp, offering multidirectional guidance and enhancing vertical closure. The appliances were made using 21-gauge stainless steel orthodontic wires and assembled in cold cure clear acrylic [Figure7].

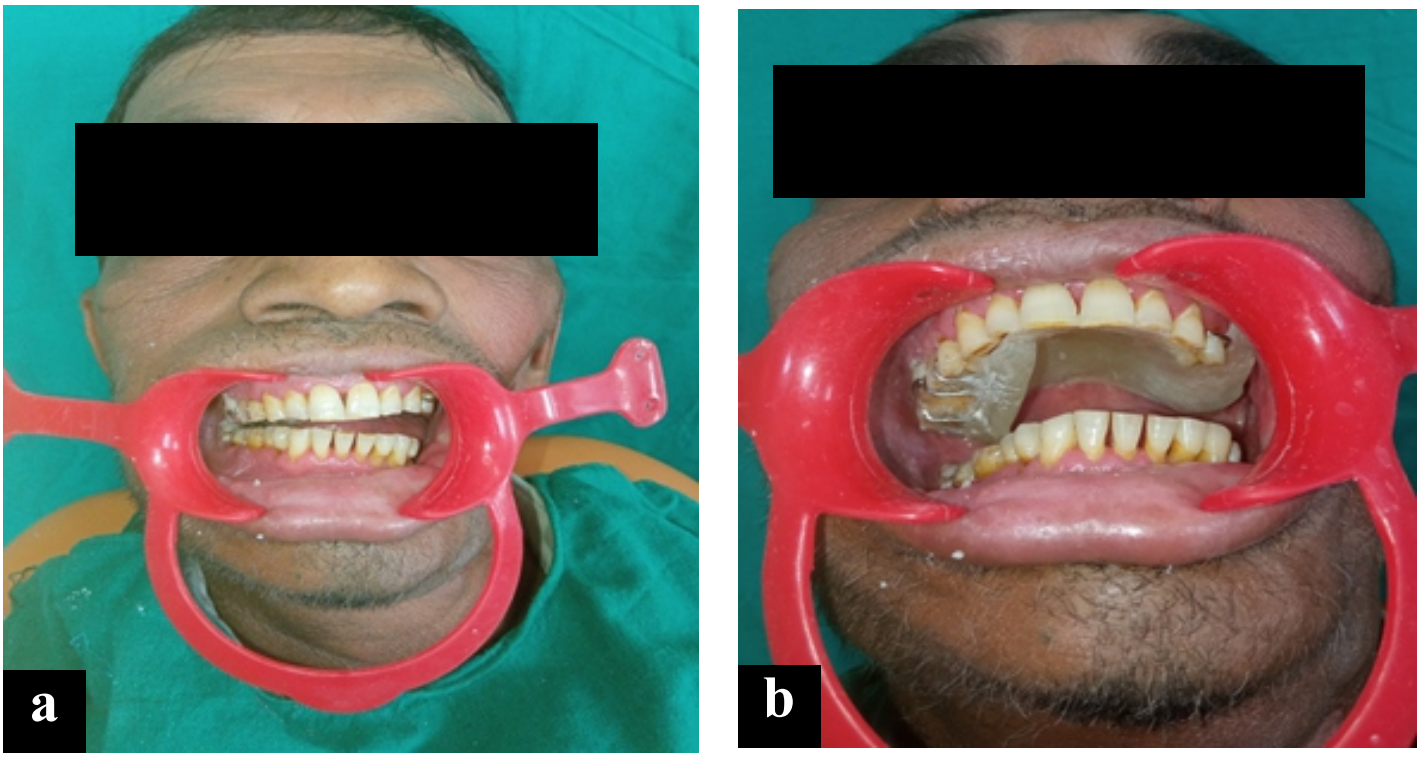


**Figure 6**: Placement of Palatal Ramp Appliance which Prevents the Return of Mandible to the Defect Side (Left Side)
(a - Frontal View, b - Occlusal View)


**Figure 7**: The Armamentarium

2 - Pin Heads and 2 - C-Claps were made for maxillary arch for passive retention [Figure 8].

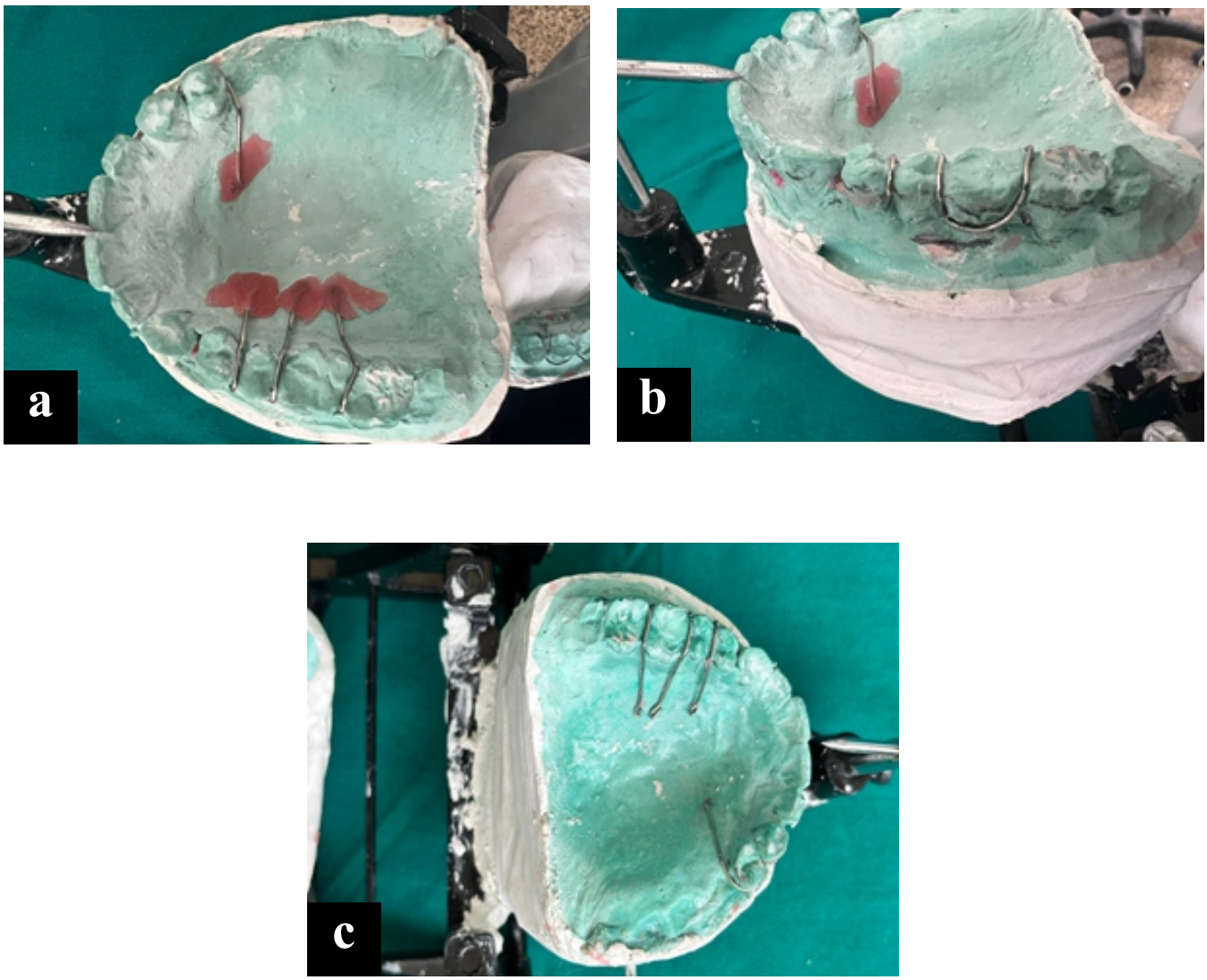


**Figure 8**: Palatal Ramp Appliance Wire Bending on the Maxillary Cast
(a - Occlusal View, b - Right Lateral View, c - Occlusal View without Wax Stabilization)

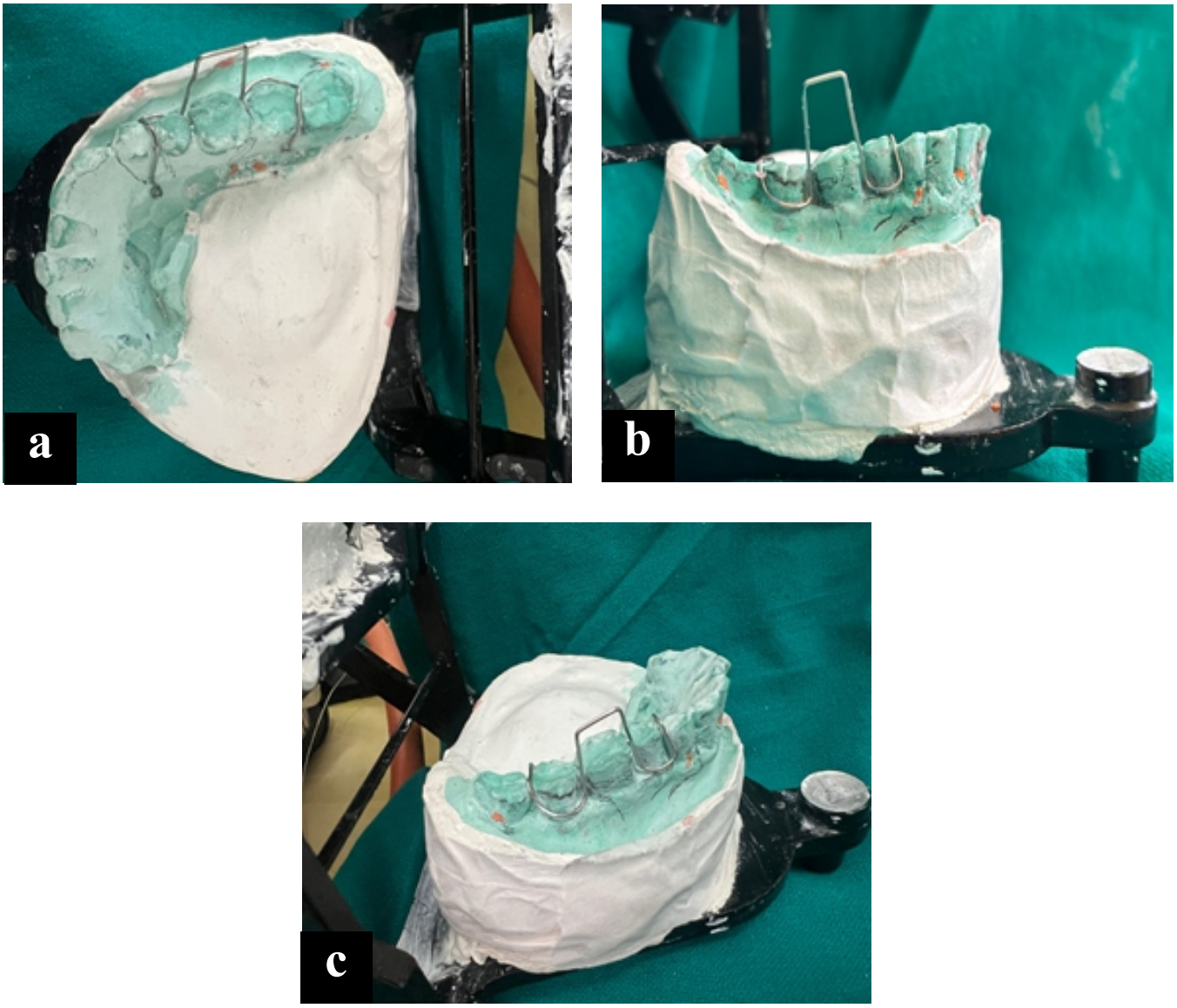


**Figure 9**: Buccal Guiding Flange Appliance Wire Bending on Mandibular Cast
(a - Occlusal View, b - Right Side View, c - Right Side Lateral View)

A modified wire bending was done in mandibular arch for buccal guiding flange prosthesis [Figure 9], which would facilitate the returning of the mandible to its desired occlusal position.

A palatal ramp in maxillary arch would prevent the mandible from returning back to its pathological position. Impression of maxillary and mandibular arches were made using silicone based Putty and light body for proper recording of details. Bite registration was done using soft Modeling wax (wax was made soft by putting it in hot water-bath). The casts poured out of the impression using type iii gypsum i.e.; Dental stone and base was formed by using type ii gypsum i.e.; Dental plaster. These casts were articulated on Mean value articulator [Figure10], using the registered bite. After articulation wire bending was done on the cast using 21-gauge orthodontic wire and later assembled using clear cold cure acrylic.

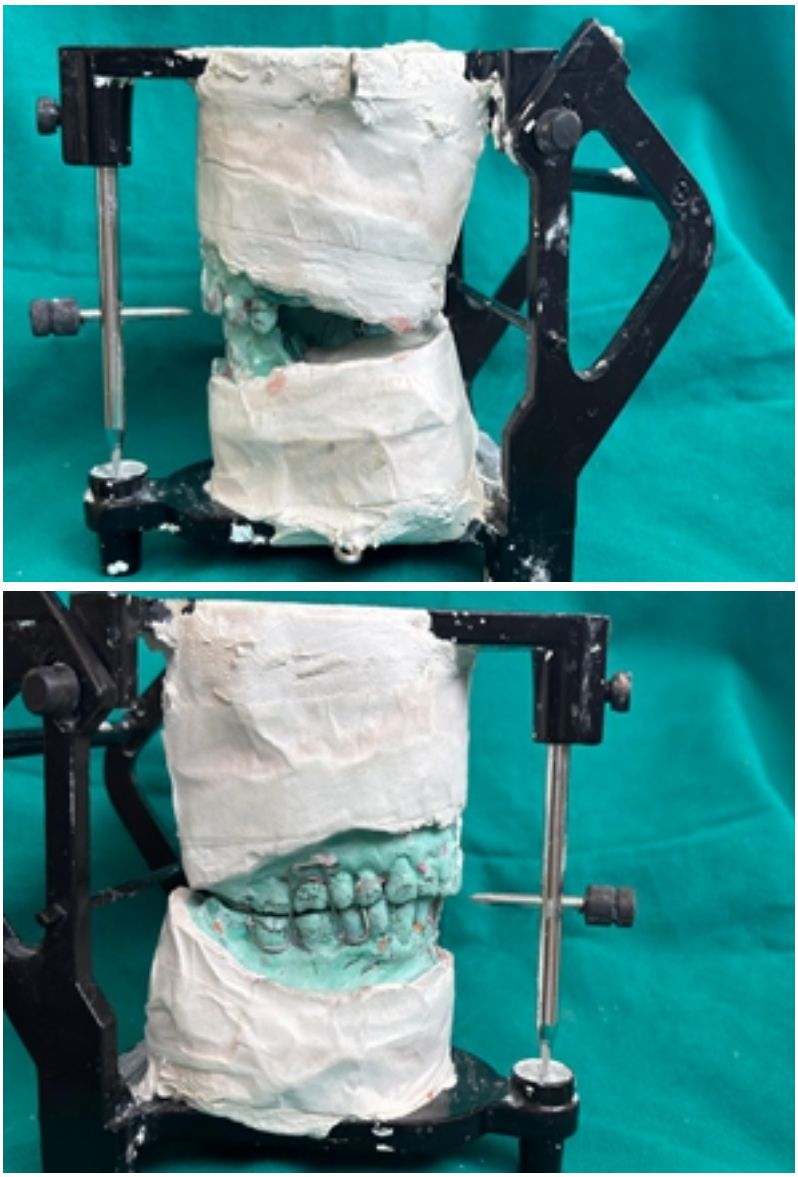

**Figure 10**: Articulated Casts in Centric Relation on Mean Value Articulator

## CONCLUSION

This case demonstrates that a modified guide flange prosthesis, combined with a palatal ramp, can significantly improve psychological and functional outcomes in patients with hemimandibulectomy[5,8,9], combined with a palatal ramp, can significantly improve psychological and functional outcomes in patients with hemimandibulectomy. Early prosthodontic intervention is essential to reduce mandibular deviation, restore mastication, and facilitate long-term rehabilitation[5,8,9].

**CONFLICT OF INTEREST**: None

**FINANCIAL SUPPORT**: None

**REFERENCES**


1. Shafer WG, Hine MK, Levy BM, Tomich CE. A Textbook of Oral Pathology. 4th ed. WB Saunders; 1993. p. 86–229.
2. Taylor TD**.** Diagnostic considerations for prosthodontic rehabilitation of the mandibulectomy patient. In: Taylor TD, ed. Clinical Maxillofacial Prosthetics. 1st ed. Chicago: Quintessence Publishing; 2000. p. 155–170.
3. Olson ML, Shedd DP. Disability and rehabilitation in head and neck cancer patients after treatment. Head Neck Surg. 1978;1:52–8.
4. Curtis DA, Plesh O, Miller AJ, et al. A comparison of masticatory function in patients with or without reconstruction of the mandible. Head Neck. 1997;19:287–96.
5. Komisar A. The functional result of mandibular reconstruction. Laryngoscope. 1990;100:364–74.
6. Patil PG, Patil SP. Guide flange prosthesis for early management of reconstructed hemimandibulectomy: a case report. J Adv Prosthodont. 2011; 3(3):172–176. doi:10.4047/jap.2011.3.3.172.
7. Hidalgo DA. Fibula free flap: a new method of mandible reconstruction. Plast Reconstr Surg. 1989; 84:71–79.
8. Hidalgo DA. Aesthetic improvements in free-flap mandible reconstruction. Plast Reconstr Surg. 1991; 88:574–585.
9. Jewer DD, Boyd JB, Manktelow RT, Zuker RM, Rosen IB, Gullane PJ, Rotstein LE, Freeman JE. Orofacial and mandibular reconstruction with the iliac crest free flap: a review of 60 cases and a new method of classification. Plast Reconstr Surg.