Case Report

JRAD Journal of Research and Advancement in Dentistry

J Res Adv Dent 2019;9:2:79-82.

# Use of Modified Immediate Denture as Gunning Splint Prosthesis for Conservative Management of Bilateral Condylar Fracture: A Clinical Modification

**Prachi Jain[1] Jay Dutt Tiwari[2*] Sonika Yadav[3] Abhinandan Soni[4] Akanksha Zutshi[5] Akhilesh Kumar[6]**

[1]Senior Resident, Department of Prosthodontics, Pt BD Sharma PGIDS, Rohtak, Haryana, India.
[2]Senior Resident, Department of Dental Surgery, MLN Medical College, Allahabad, Uttar Pradesh, India.
[3]Senior Resident, Department of Dental Surgery, MLN Medical College, Allahabad, Uttar Pradesh, India.
[4]Intern, Pt BD Sharma PGIDS, Rohtak, Haryana, India.
[5]Senior Lecturer, Department of Oral and Maxillofacial Surgery, National Dental College, Dera bassi, Punjab, India.
[6]Senior Resident, Department of Dental Surgery, MLN Medical College, Allahabad, Uttar Pradesh, India.

## ABSTRACT

**Background**: The surgical approach for the treatment of fracture in older patients presents with higher postoperative morbidity compared to the younger patients. Non surgical means by closed reduction and immobilization is a better option in such cases. But loss of teeth poses difficulty as guidelines provided by occluding teeth for reduction and fixation of fracture are absent. Gunning splint can be used in such cases to provide stabilization and thus improving prognosis. This case report presents a method of fabrication of the immediate prosthesis used as Gunning splint in maxillary edentulous and mandibular partially edentulous patient with fracture.

**Keywords:** Fracture, Partial Edentulism, Modified Gunning splint.

## INTRODUCTION

Fractures of the mandibular condylar process 'have provided one of the many challenges to the surgeon over the years. The fractures which present vary considerably but are well recognised by those who deal with them. Such controversy as arises is mainly in relationship to treatment.[1,2] When the methods of treatment which are employed appear to be uniformly satisfactory, only a critical unbiased appraisal of results over a large series of such cases can possibly indicate preference for one method of treatment as opposed to another. In all such studies time plays a fundamental role and the importance of this point cannot be overemphasised. Immediate good post-treatment results are not necessarily maintained.[3]

The objective of this paper is to report a method of fabrication of the immediate prosthesis used as Gunning splint in maxillary edentulous and mandibular partially edentulous patient with fracture.

## CASE REPORT

A 59 year old female patient with chief complaint of reduced mouth opening and difficulty in mastication reported. The patient had a history of trauma 3 days ago. Orthopantomograph showed bilateral condylar fracture (Figure 1). The general condition of the patient was debilitated with a medical history of diabetes and hypertension. Thus, it was decided to perform closed reduction with maxillomandibular fixation. But the intraoral examination revealed multiple missing teeth and root stumps in the maxillary arch whereas the mandibular arch showed anterior teeth with Grade II mobility, multiple root stumps in the left posterior region. Intact teeth were present in the

**Received:** Oct. 23, 2018**: Accepted**: Jan. 4, 2019
***Correspondence Dr. Jay Datt Tiwari.**
Department of Dental Surgery, MLN Medical College, Allahabad, Uttar Pradesh, India.
**Email: jdtewari@gmail.com**




pISSN 2278-0076
eISSN 2321-9270

right posterior region (Figure 2). No other significant finding was observed in the oral cavity. Thus, it was decided to fabricate immediate maxillary complete denture and mandibular removable partial denture. It was planned to incorporate arch bars in the denture to aid in intermaxillary fixation.

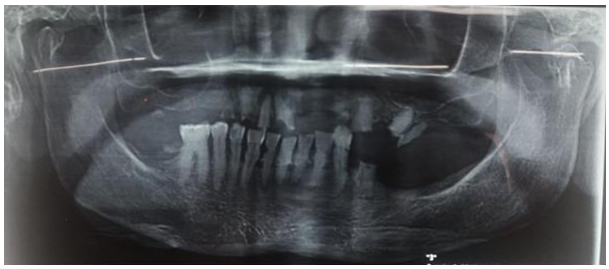

Fig 1: Orthopantomograph showed bilateral condylar fracture.

Fig 2: Intraoral photograph revealed multiple missing teeth and root stumps.

Fig 3: Intraoral photograph showing recording of jaw relations at appropriate vertical dimension.

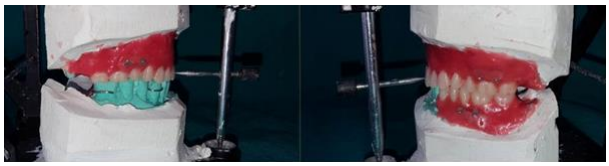

Fig 4: Teeth arrangement.

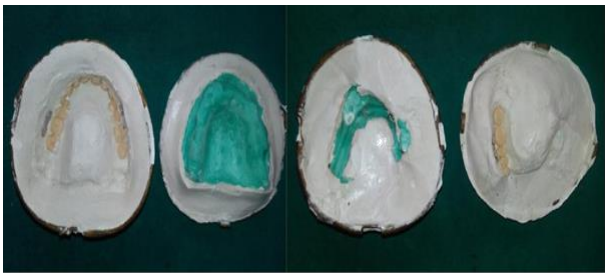

Fig 5: Flasking procedure.

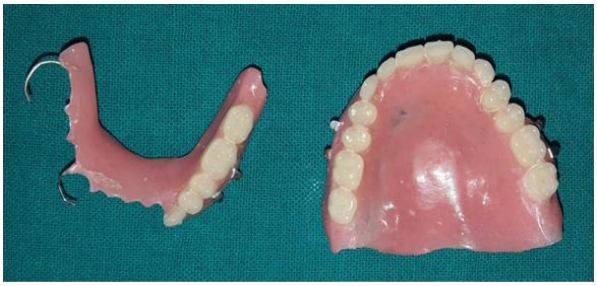

Fig 6: Finished and polished dentutre.

Fig 7: Maxillary splint.

Fig 8: Eyelet wiring and IMF fixation.

Fig 9: IMF fixation.

Fig 10: IMF Fixation for immobilization.

***Prosthodontic Procedure***

Impression of the maxillary and the mandibular arches were made using irreversible hydrocolloid impression material and poured in Type III Gypsum product to obtain casts. Record bases with occlusal rims were fabricated on these casts. Jaw relations were recorded at the appropriate vertical dimension (Figure 3) and mounted on the articulator.

After articulation, the cast was modified to scrape all the teeth from the maxillary and mandibular region planned to be extracted during the surgical phase. Scraping was done using BP blade. To compensate for the shrinkage of soft tissues after the extraction, scraping was done in such a way that 2mm of the cast from the attached gingiva was removed. Care was taken not to do overscraping. Thereafter, all the sharp margins were rounded off on the cast and a convex contour was retained where the teeth were removed.

Teeth arrangement was then carried out. At the wax up stage, arch bars were incorporated bilaterally in the buccal posterior segments of maxillary region and left buccal posterior segment of mandibular region (Figure 4).

The flasking procedure was then carried out. During dewaxing, it was ensured that the teeth and arch bars remain undisturbed while the mould was flushed with clean boiling water (Figure 5). Thereafter, packing was done with heat cure acrylic resin and curing was done according to short curing cycle protocols. After bench cooling, dentures were retrieved and finishing and polishing procedures were carried out (Figure 6). They were then disinfected in glutaraldehyde solution.

**Surgical procedure**

During the surgical procedure, first all the root stumps were extracted followed by closure with sutures. Thereafter, maxillary splint was inserted in the patient's mouth. Holes were drilled through the splint in the canine region on both the sides and the splint was fixed using intermaxillary fixation (IMF) screws of diameter 2.7 mm and of length 14 mm (Figure 7).

In the mandibular arch, eyelet wiring was done with respect to posterior teeth in the fourth quadrant. To stabilize the denture the wire was passed through the lingual flange of the denture. Further stabilization was achieved through the IMF screw (dimension 2.7 mm x 14 mm) inserted in the left premolar region. After securing the splints to the underlying bone, intermaxillary fixation was done to provide immobilization (Figure 8, 9 and 10).

After 3 weeks, the wires secured with arch bars were removed. The denture was relined using the tissue conditioner. Arch bars incorporated into the denture were removed and the space created was filled with self polymerizing acrylic resin. It was given to the patient to be used as an interim denture until the definitive prosthetic rehabilitation.

## DISCUSSION

Mandible in the geriatric patient is more vulnerable to fracture due to decreased vascularity and loss of bone mass.[1] Treatment approach in such patients should be non surgical i.e. conservative due to higher incidence of complications associated with advancing age. To restrict the movements, closed reduction should be done. But this is sometimes difficult as closed reduction require the presence of

teeth which act as guide for reduction and geriatric patient often present with partial or complete edentulism.[2]

In such cases, Gunning type of splint can be used which act as a guide for closed reduction and stabilization. The Gunning splint was first described by Thomas Brain Gunning, an English born American dentist, for the immobilization of edentulous or partially edentulous jaw segments after reduction[3,4]. According to GPT, it is defined as a device fabricated from casts of edentulous maxillary and mandibular arches to aid in reduction and fixation of a fracture[5]. Its advantage include[4]:

• Avoidance of exposure of the fractured site

• Non invasive nature of the treatment

• Relatively simple procedure with low cost

In this case report, as the patient had multiple teeth indicated for extraction, proper occlusion to guide the reduction was missing. Thus, gunning splint with modification in the form of an immediate denture was fabricated. Traditionally gunning splint has been stabilized using various techniques such as per alveolar wiring, circummandibular wiring or circumzygomatic wiring.[6] But these techniques are associated with complications such as puncturing and contamination of maxillary sinus, injury of the palatal vessels while placement, injury of the adjacent soft tissues and structures at the floor of the mouth.[6] Also, such procedures are done under general anaesthesia which has its own complications.

Thus, in this case modification was done and the splints were fixed to the underlying bone using I.M.F screws which aided in the successful closed reduction. The whole procedure was done under local anaesthesia and the splint was used as an interim denture after removal of the wires and arch bars until the definitive prosthesis was given to the patient which furthur added to the patient's comfort.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

## REFERENCES

1. Rathee M, Goel M, Hooda A, Kumar A, Kundu R. Conservative splint therapy for atrophic edentulous mandible fracture in a geriatric patient.

2. Nadhan LS, Ebenezer V, Balakrishnan R. Management of the edentulous mandible review article. Biomed Pharmac J 2014; 7 (1): 143-146

3. Moodie F. Mr. Gunning and his splints. Br J Oral Surg Nov 1969; 7 (2): 112– 115.

4. Dharaskar S, Athavale S, Kakade D. Use of gunning splint for the treatment of edentulous mandibular fracture: A case report. J Indian Prosthodont Soc. Dec 2014; 14 (4): 415-418.

5. The Glossary of Prosthodontic Terms, 2008.

6. Chaudhary Z, Sharma R, Krishnan S. Maxillo Mandibular fixation in edentulous scenarios: Combined MMF screws and gunning splints. J maxillofac Oral Surg Feb 2013.