

AN INTER-MAXILLARY FIXATION USING GUNNING SPLINT: CASE REPORT

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Abstract:

Management of fractures segments in cases of atrophic edentulous patients by open reduction becomes difficult because of the medical condition of the patient and aging. Hence the use of gunning splint was presented to carry out the closed reduction of the fractures segments. It proves to be a beneficial option for the reduction and stabilization of the segments thus improving the prognosis.

Key Words: Atrophic Mandible, Gunning Splint, Intermaxillary Fixation.

INTRODUCTION

Reduction, immobilization and fixation are the three steps in the management of fracture. Mandibular fracture is the most frequently observed fracture as compared to any other facial bone due to its prominence. Susceptibility to mandibular fracture increases with edentulism and aging.¹ Treatment of edentulous mandibular fracture becomes difficult due to reduced blood supply, less potential for rapid and uneventful healing, atrophy of ridges and loss of definitive occlusal contacts. Therefore, instead of open reduction closed reduction of mandible with fixation using gunning splint is preferred.^{2,3} Gunning splint named after its presenter, Thomas Brain Gunning (1813–1889) is a type of monoblock resembling two bite blocks which are joined together.⁴ Gunning splints appears as modified dentures in which bite blocks are present posteriorly and anteriorly in the incisal area space is available to for feeding purpose. For immobilization of the upper splint, maxilla is attached by peralveolar wiring and lower splint is attached to the mandible by circumferential wiring. Wire loops or elastic bands are used to connecting the two splints for intermaxillary splinting.^{5,6}

This clinical report thus discusses the steps for the fabrication of gunning splint and its intraoral fixation.

CASE REPORT:

A 68 year old male patient was referred from the Department of Oral and Maxillofacial Surgery to the Department of Prosthodontics Crown and Bridge with fractured anterior body for the fabrication of gunning splint. The fracture was due to road traffic accident 2 days ago. On extraoral examination mild swelling was seen corresponding to the chin. On palpation the swelling was associated with tenderness. On intraoral examination periodontally compromised maxillary second right molar, mandibular right second molar, mandibular left lateral incisors, mandibular left canine and mandibular left second premolar along with various root stumps were present (figure 1). All the teeth were periodontally compromised with Grade 2 mobility. Orthopantograph revealed undisplaced fracture in the anterior region.(Figure 2) Fracture line was extending till the base of the mandible in an obliquely favourable manner. No relevant medical history was present.

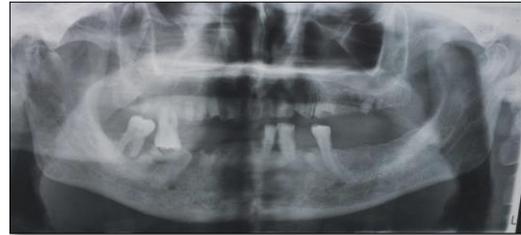


Figure 1 Orthopantograph Showing Mandibular Fracture.



Figure 2- Intra Oral View

TREATMENT PLAN

Closed reduction of the fractured segment was planned as a treatment option because of the presence of 3 periodontally compromised teeth in the edentulous mandibular arch. Removal of the remaining teeth followed by use of gunning splint was planned. The splint was planned to be stabilized with stainless steel MMF screws in maxilla and mandible followed by intermaxillary fixation (IMF) with arch bar embedded in resin of the splint.

TREATMENT PROCEDURE

Impression of the maxillary and mandibular arch was made using irreversible hydrocolloid (Algitex, HeraeusKulzer, South Bend, IN) Casts were poured using Type III gypsum product (Dentsone) (Figure 3). Base plate was fabricated using cold cure acrylic resin and occlusal rims with modeling wax were prepared. Maxillary cast was mounted using arbitrary facebow (Hanau Springbow) and the patient's centric relation was recorded. The maxillary and mandibular casts were mounted in a semi adjustable articulator (Hanau widevue) (Figure 4). The teeth were trimmed from the cast using Jerbi's method of trimming of master cast for immediate denture. The anterior portion of the occlusal



Figure 3 Maxillary and Mandibular casts



Figure 4 Mounting of the Maxillary and Mandibular casts.



Figure 5 Notch and trough made on maxillary and mandibular cast.

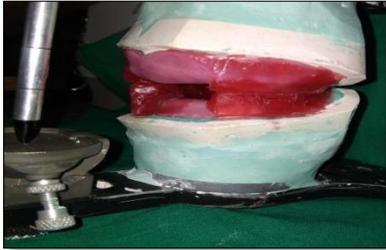


Figure 6 Anterior portion removed for feeding



Figure 7 Processed gunning splint with clear acrylic.



Figure 8 Intermaxillary Fixation done and vertical height of the patient was maintained.

rims was removed to create space for feeding and a notch and trough was also fabricated on the occlusal surface of both the sides to limit the anteroposterior movements (figure 5,6). Once the rims were finished and polished and the anterior space for feeding was verified the gunning splint was processed with clear acrylic resin (Figure 7). After obtaining the bite blocks arch bars were inserted onto the buccal side of both the maxillary and

mandibular bite blocks using cold cure acrylic resin for inter maxillary fixation. During arch bar placement it was ensured that the hooks were symmetrically placed in order to achieve calculable tension in between the two bars. During the surgical procedure first the maxillary splint was fixed to the bone using maxillomandibular fixation screws. This was followed by closed reduction and

approximation of the fractured mandibular segments using hand manipulation. Once approximation was achieved the mandibular splint was also fixed with maxillomandibular fixation screws. Next the intermaxillary fixation was done with arch wires to provide firm immobilization (Figure 8,9). The intermaxillary fixation was kept for 6 weeks and the regular follow-up was done during this period.

DISCUSSION

There are various significant degenerative changes which occur as a result of aging.⁷ One such change is disappearance of endosteal vascular supply from inferior alveolar artery and increased dependency of the bone on the periosteal vascular supply. The cross sectional area is reduced in atrophic edentulous mandible as compared to dentate mandible. Thus in open reduction it might lead to slow and complicated healing process of the fracture site.⁸ Also if mandible is edentulous and atrophic the fractured fragments get easily displaced. It becomes unsuitable for screwing and plating. Hence use of gunning splint for closed reduction proves to be advantageous.⁹ Moreover, for the prosthetic view point the vertical dimension is also maintained for the future prosthesis.

CONCLUSION

Gunning splint have proved to be a very good treatment option for the fracture of atrophic edentulous mandible. These are easy to fabricate, cost effective and proves to be a minimally invasive technique. It brings about satisfactory union of the fractured segments in cases of atrophic edentulous mandible.

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How to cite this article: Garg S, Dable RA, Rao RS, Shrivastava SP, Sethi C. An Inter-Maxillary Fixation Using Gunning Splint: Case Report, *TMU J Dent* 2019;6(1):23-25.