ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 2, Issue – 4, July – August - 2019, Page No. : 392 - 394

Treatment of Mandibular Fractures with a Malleable Non-Compression Miniplate: A Prospective Study

[1]Dr. Gajendra Bagri, [2]Dr. Saurabh Jain, [3]Dr. Mital Asodariya,[4] Dr. Nikunj A. Makwana

[1,3,4] MDS Oral &Maxillofacial Surgery

[2]MDS,Periodontology & Oral Implantology

Government Dental College, Jaipur

Corresponding Author: Dr. Saurabh Jain

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: The maxillofacial area has one of the highest reported frequencies of injuries in the human body, with the mandible being especially commonly affected due to its relative protuberance as compared to the rest of the facial skeleton.

Methods: The study comprised of 30 patients having mandibular fractures, attending the outpatients department and emergency of Department of Oral & Maxillofacial Surgery.

Results: In the present study maximum number of patients was treated within time lapse of 8-11 days (50.00%). Mean time lapse between injury and definitive management was seen to be 8.64days. A minor complication (6.66%) of wound dehiscence was noted which was treated with wound irrigation and local measures. There was one major complication with infection (6.66%) at fracture site. The other fracture sites healed without any complications. Pain also observed in one patient out of 15 patients.

Conclusion: The Non-compression, thin, Malleable Miniplate in mandibular fractures is efficacious enough to bear masticatory loads during the osteosynthesis of fracture.

Keywords: Malleable Miniplate, Mandible,Fracture.

Introduction

The maxillofacial area has one of the highest reported frequencies of injuries in the human body, with the mandible being especially commonly affected due to its relative protuberance as compared to the rest of the facial skeleton.[1]

Mandibular fractures are reported to have an incidence of 15.5% to 59% among facial trauma worldwide, and they are considered to be the second most common facial fractures presenting to the ER.[2]

The epidemiology of maxillofacial injuries differs from one country to the next and is time dependent. Maxillofacial injuries also rely on multiple factors, including demographics, socioeconomic status, gender, age etc

Material and Methods

The study comprised of 30 patients having mandibular fractures, attending the outpatients department and emergency of Department of Oral & Maxillofacial Surgery, Government dental College & Hospital ,Jaipur.

Preoperatively detailed medical history of the patients was recorded. Patients were diagnosed on the basis of clinical examination and radiographic interpretation. Routine

investigations were done. Informed consent was taken to participate in the study.

Inclusion criteria

1. The patients were taken up randomly irrespective of age, sex, caste and creed.

Patients with isolated fractures of mandible were selected.

Exclusion criteria

1. Refused consent.
2. Patients who were suffering from major systemic disease.
3. Mandibular fractures with comminution and infection were excluded.
4. Pathological fracture.
5. Pregnant and lactating females.

Result

Table 1: Site distribution

Fracture site	Number of patients with fractures	Percentage of patients with fractures
Symphysis alone	2	6.66
Parasymphysis alone	2	6.66
Angle alone	10	33.33
Parasymphysis + U/L Condyle	6	20
Parasymphysis + B/L Condyle	2	6.66
Symphysis + Angle	3	10.00
Angle+Body	3	10.00
Parasymphysis + Angle	2	6.66
Total	**30**	**100**

Angle alone was the most commonly involved site, followed by parasymphysis with unilateral condyle and parasymphysis with angle.

Table 2: Occlusion

	Pre op.	Post op.
Deranged	27	0
Intact	3	30

Preoperative occlusion was found to be deranged in 27 out of the 30 patients. The functional occlusion was achieved postoperatively in all the patients.

Table 3: Time Lapse between injury and definitive management.

Time lapse (days)	Number of patients	Percentage
<1	-	-
1 – 3	-	-
4 – 7	10	33.33
8 – 11	15	50.00
12 – 15	5	16.67
Total	**15**	**100**

In the present study maximum number of patients was treated within time lapse of 8-11 days (50.00%). Mean time lapse between injury and definitive management was seen to be 8.64 days.

A minor complication (6.66%) of wound dehiscence was noted which was treated with wound irrigation and local measures. There was one major complication with infection (6.66%) at fracture site. The infection resolved after hardware removal and the fracture showed delayed healing during the follow-up period. The other fracture sites healed without any complications. Pain also observed in one patients out of 15 patients.

Discussion

The art of surgery demands that we evaluate the risk and benefits of each treatment modality and apply it appropriately to each patient. This is true in the management of maxillofacial trauma as well and mandibular fractures especially. As there are a vast variety of treatment modalities for managing mandibular fractures, it remains imperative that we should consider the anatomic, physiologic and biomechanical factors associated with managing these injuries.

It is well established that bone healing is optimized by precise anatomic reduction and rigid immobilization. Once fractures are reduced and immobilized, optimal bone

repair is dependent on preservation and maintenance of intact blood supply. Movement of fractures causes disruption of the osteogenic elements and capillaries. This results in formation of poorly vascularized fibrous tissue which gives rise to complications in fracture healing like fibrous union or sometimes even non-union.

In 1973 Michelet[3] and later in 1978 Champy[4] and co-workers introduced non-compression miniplates in the treatment of mandibular fractures to overcome the disadvantages of the bulkier and technique demanding compression plating systems. Champy outlined the zones of ideal osteosynthesis in the mandible and described the specific areas of mandible for placement of bone plates to overcome the displacing forces acting on the mandible. The advantages of the mini plate osteosynthesis are: Smaller plates, easily adaptable with monocortical screw. Intraoral approach can be used with no scar formation, occlusal discrepancies are reduced, and no intermaxillary fixation is necessary thereby reducing patient discomfort.

The Rationale of using monocortical plate in mandibular fracture is that synthesis by plate screwed on the outer cortical plate is solid enough to support the strain developed by masticatory muscle. On the horizontal ramus, the masticatory forces create within the mandible, elongation strain along the alveolar border and compressive strain along the lower border. Only the traction strains are injurious and have to be neutralized. The study of movements with regards to the mathematical model of mandible **(Champy *et al.* 1978)[4]** showed that at the level of horizontal ramus, there are almost only flexion movements, the value of which increases from the front backwards. In the anterior part of mandible, anterior to first premolar, there are mainly movements of torsion. They are higher, when they are nearer to the mandibular symphysis. Therefore the principle of osteosynthesis is to re-establish, the mechanical qualities of the mandible, taking into account the anatomical conditions.

Conclusion

The Non-compression, thin, Malleable Miniplate in mandibular fractures is efficacious enough to bear masticatory loads during the osteosynthesis of fracture.

References

1. Banks,P . Killey's Fracture of the middle third of the facial Skeleton.5th Edition 1987; John Wright & Son .Bristol Pg 13.
2. Rosenberg A, Gratz KW, Sailer HF. Should titanium miniplates be removed after bone healing is complete? Int J Oral Maxillofac Surg 1993; 22:185-188.
3. Michelet FX, Deymes J, Dessus B. Osteosynthesis with miniaturized screwed plates in maxillo-facial surgery. J Maxillofac Surg. 1973 Jun;1(2):79-84.
4. Champy M, Lodde JP, Schmidt R (1978). Mandibular osteosynthesis by miniature screwed plates via a buccal approach. *J Maxillofac Surg* 6: 14.