CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3908495

Available online at: http://www.iajps.com *Research Article*

POSTOPERATIVE COMPLICATIONS IN PATIENTS WITH MANDIBULAR ANGLE FRACTURE, TREATED BY THREE-DIMENSIONAL PLATE

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Article Received: April 2020 **Accepted:** May 2020 **Published:** June 2020

Abstract:

Introduction: *Mandibular fractures are among the most common injuries to the facial skeleton. It has been reported to comprise between 40 and 62% of all facial fractures.* ***Objectives:*** *The main objective of the study is to analyse the postoperative complications in patients with mandibular angle fractures, treated with three dimensional plate.* ***Material and methods:*** *This cross sectional study was conducted in Health department Punjab during July 2019 to Feburary 2020. 50 patients with insignificant medical history were involved in the study. A single plate was used in fracture of symphysis, parasymphysis, body, as well as angle region. It was fixed with 6.0 mm and 8.0 mm screws.* ***Results:*** *The data was collected from 50 patients. Mean age of patients was 30.95 ± 12.37 years. Five patients with MAF had postoperative complications that required additional procedures. Three patients had postoperative infection, one patient complained of malocclusion in the first postoperative week, and one patient had miniplate exposure three months after surgery.* ***Conclusion:*** *It is concluded that the use of a 3-D titanium miniplates are effective in the treatment of mandibular fractures and overall complication rates are lesser.*

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Please cite this article in press Ayesha Shaukat et al., ***Postoperative Complications In Patients With Mandibular Angle Fracture, Treated By Three-Dimensional Plate,*** *Indo Am. J. P. Sci, 2020; 07(06).*

INTRODUCTION:

Mandibular fractures are among the most common injuries to the facial skeleton. It has been reported to comprise between 40 and 62% of all facial fractures. The goal of treatment of mandible fractures should be to return the patient to a preinjury state of function and aesthetics. The mandibular angle is one of the most frequent sites for fractures of the lower jaw, accounting for between 20% and 36% of all mandibular fractures [1].

Through the decades, various plate and screw osteosynthesis have been introduced like AO plating system, miniplating system, resorbable plates and screws. Transorally placed miniplates have gained wide acceptance for the treatment of mandibular fractures as described by Champy *et al*. Non-comminuted symphyseal and parasymphyseal fractures, as well as condylar fractures, can be treated with two miniplates, and at times, favorable, undisplaced angle fractures can be treated with an upper border [2].

Mandibular angle fractures (MAFs) are among the most common maxillofacial injuries; they are associated with the highest complication rates of all mandibular fractures, yielding an incidence as high as 32% [3]. These fractures are frequently associated with facial lacerations (32%), cervical spine injuries (2 to 10%), orthopedic injuries (20%), neurologic injury (24%), and thoracic and abdominal injuries (12%). The MAF is defined as a fracture line that begins where the anterior border of the mandibular ramus meets the body of the mandible and extends inferiorly through the inferior border or posteriorly toward the gonial angle [4]. Fracture osteosynthesis is widely considered the standard treatment of these fractures; however, controversy remains regarding the ideal treatment modality of MAFs [5].

Objectives

The main objective of the study is to analyse the postoperative complications in patients with mandibular angle fractures, treated with three dimensional plate.

MATERIAL AND METHODS:

This cross-sectional study was conducted in Health department Punjab during July 2019 to Feburary 2020. 50 patients with insignificant medical history were involved in the study. A single plate was used in fracture of symphysis, parasymphysis, body, as well as angle region. It was fixed with 6.0 mm and 8.0 mm screws. In the parasymphysis and body region, 3-D plate was fixed above the level of mandibular canal. The lower border screws were fixed first, followed by upper border screws. Local or general anesthesia was used for the patient as dictated by the case. After adequate exposure of fracture fragments, debridement and curettage was done. The fracture fragments were reduced to their anatomical form and jaws were placed into intermaxillary fixation (IMF). The 3-D miniplate was adapted adequately and placed over surface.

RESULTS:

The data was collected from 50 patients. Mean age of patients was 30.95 ± 12.37 years. Five patients with MAF had postoperative complications that required additional procedures. Three patients had postoperative infection, one patient complained of malocclusion in the first postoperative week, and one patient had miniplate exposure three months after surgery. Infection in the form of swelling and pus drainage continued to persist in 2 (5%) patients even during the third follow-up at the end of 2 weeks postoperatively. However, due to antibiotic coverage, pus drainage had considerably reduced. No other case reported with paresthesia, occlusal defects, wound dehiscence, hardware failure, or 3-D plate instability.

Table 01: Change in infection status at different follow-up intervals as compared to baseline evaluation

Variable	Infection		Significance of change	
	No.	%	χ^2	*P*
Baseline	0	0	–	–
First follow-up	0	0	–	–
Second follow-up	2	5	1.026	0.311
Third follow-up	2	5	1.026	0.311
Fourth follow-up	0	0	–	–
Fifth follow-up	0	0	–	–
Final follow-up	0	0	–	–

Table 02: Postoperative assessment

Variable	Present		Absent	
	No.	%	No.	%
Infection	0	0	40	100
Occlusal defects	0	0	40	100
Paresthesia	0	0	40	100
Wound dehiscence	0	0	40	100
Hardware failure	0	0	40	100
3-D plate instability	0	0	40	100

DISCUSSION:

The problem of postoperative infection has long been debated and represents a major complication of MAFs. Ellis found that the use of a single miniplate at the superior border was sufficient to treat such fractures, and that the use of plates raises the incidence of infection dramatically [6]. Conversely, some of the literature has reported no relevant difference in rates of infection for 1- versus 2-plate techniques. Mehra and Haitham noted that the use of fewer plates results in less periosteal stripping, which can lead to less blood supply disruption, and decreased operating time, which can decrease the rate of postoperative infections [7]. A recent prospective study on MAFs found that the use of a strut plate at the angle had relatively less or no postoperative complications compared with other techniques [8]. Therefore, which method of fixation yields the least postoperative infections? The present study showed no statistically meaningful correlation between fixation type and rate of postoperative infection [9]. The differences in rates of infection among various studies might be attributed to inherent differences in the patient population being studied variations in socioeconomic status, differences in tobacco and alcohol use and abuse, and levels of nutritional status, and other medical co-morbidities [10].

CONCLUSION:

It is concluded that the use of a 3-D titanium miniplates are effective in the treatment of mandibular fractures and overall complication rates are lesser. Fracture mobility is the main cause of infection postoperatively; however, 3-D plating systems have adequate stability after fixation of fracture. The stability of 3-D plate is gained over a defined surface area and is achieved by its configuration and not by its thickness or length.

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