

Original Article

Comparison of Three Treatment Modalities in Management of Mandibular Angle Fracture

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ABSTRACT:

Background: The mandibular angle shows the maximum number of complications among all mandibular fracture sites. The present study was conducted to compare treatment modalities in the management of mandibular angle fractures. **Materials & Methods:** The present study was conducted on 45 patients. All patients were divided into 3 groups. Each group consisted of 15 patients each. In group I patients, 2.0 mm locking plates were used. In group II patients, metal non-locking miniplates were used and in group III, bioresorbable plating was done. Complications were recorded in all groups. **Results:** Out of 45 patients, males were 25 and females were 20. The difference was non-significant (P=0.1). Group I (15) locking plates were used. In group II patients (15) non-locking miniplates and in group III (15), bioresorbable plates were used. The difference was non-significant (P=1). Intraoral technique was used in 7 patients in group I, 5 in group II and 9 in group III. Transbuccal technique was used in 8 in group I, 10 in group II and 6 in group III. Screws were used in 10 in group I, 7 in group II and 11 in group III and 4 screws were used in 5 in group I, 8 in group II and 4 in group III. Common complication was infection, plate removal due to infection and delayed union. **Conclusion:** Common complications were infection, delayed union and loss of secondary reduction. There was no difference complication in management with any of technique.

Key words: Infection, Miniplates, Mandibular angle

Received: 14 December 2017

Revised: 20 December 2017

Accepted: 25 December 2017

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This article may be cited as: Dutt M. Comparison of Three Treatment Modalities in Management of Mandibular Angle Fracture. *Int J Res Health Allied Sci* 2018;4(1):99-101.

INTRODUCTION

Mandibular angle fractures represent the largest percentage of mandibular fractures. Two of the most common causes of mandibular angle fractures are motor vehicle collisions and assaults or altercations. There are two main proposed reasons why the angle of the mandible is commonly associated with fractures. The first reason is the presence of a thinner cross-sectional area relative to the neighboring segments of the mandible. Second is the presence of third molars, particularly those that are impacted, which weakens the region. Mandibular angle fractures pose a unique challenge for surgeons because they have the highest reported postoperative complication rate of any mandibular area.¹ The mandibular angle shows the maximum number of complications among all mandibular fracture sites. The amount of rigidity required, type of plates, surgical approaches, and third molar in the fracture line affects the management of mandibular fractures. Angle fractures pose a unique clinical challenge for reconstructive

surgeons.² Unfortunately, few prospective randomized studies of operative technique on angle fractures have been performed. As a result, no general consensus on the optimal treatment of mandibular angle fractures has been agreed. Current treatment protocols for angle fractures involve rigid fixation in conjunction with intraoperative maxilla-mandibular fixation (MMF). This produces absolute stability leading to primary bone union and permits immediate limited postoperative physiological function. The hardware can be 2.4 mm, 2.0 mm locking, 2.0 mm non locking metal plating systems or a 2.5 mm bioresorbable system, which has shown comparable efficacy.³ The present study was conducted to compare treatment modalities in the management of mandibular angle fractures.

MATERIALS & METHODS

The present study was conducted in the department of Oral surgery. It included 45 patients. All were informed regarding the study and written consent was obtained.

Ethical clearance was taken from institutional ethical committee. General information such as name, age, gender, etiology etc was recorded.

All patients were divided into 3 groups. Each group consisted of 15 patients each. In group I patients, 2.0 mm locking plates were used. In group II patients, metal non-locking miniplates were used and in group III, bioresorbable plating was done. All fractures were treated with an intraoral combined with a transbuccal approach. Intraoperatively a single plate was applied either at the superior border lateral cortex or at the external oblique ridge.

All the patients were given antibiotic Cap Amoxicillin + Clavulanate for 5 days. All were on liquid diet for one week, gradually switching to semisolid intake in the coming weeks.

Complications such as secondary loss of reduction, delayed union, malunion, infection, and the need for plate removal surgery were recorded. Extraoral radiographs were taken to confirm the correct placement of plates. Results thus obtained were subjected to statistical analysis using chi square test. P value <0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 45		
Males	Females	P value
25	20	0.1

Table I shows that out of 45 patients, males were 25 and females were 20. The difference was non-significant (P=0.1).

Table II Distribution of patients in groups

Group I (locking plates)	Group II (non-locking miniplates)	Group III (bioresorbable plating)	P value
15	15	15	1

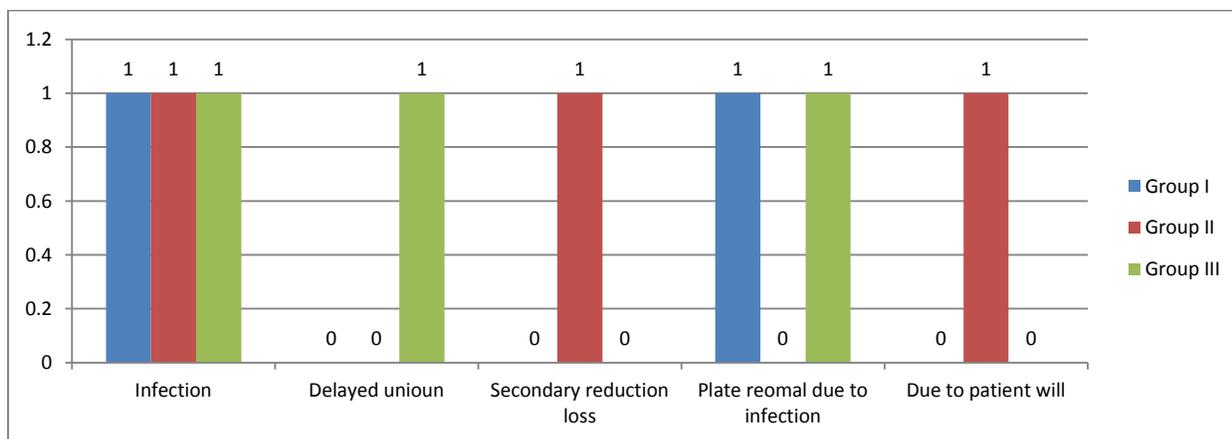
Table II shows that group I (15) locking plates were used. In group II patients (15) non-locking mini plates and in group III (15), bioresorbable plates were used. The difference was non-significant (P=1).

Table III Comparison Of Variables In Groups

Variables	Group I	Group II	Group III	P value
Intraoral	7	5	9	0.1
Transbuccal	8	10	6	0.5
2 screws	10	7	11	0.12
4 screws	5	8	4	0.01

Table III shows that intraoral technique was used in 7 patients in group I, 5 in group II and 9 in group III. Transbuccal technique was used in 8 in group I, 10 in group II and 6 in group III. Screws were used in 10 in group I, 7 in group II and 11 in group III and 4 screws were used in 5 in group I, 8 in group II and 4 in group III. The difference was non-significant (P=0.01).

Graph I Complications in groups



Graph I shows that common complications in group I was infection (1) and plate removal due to infection. In group II, complications were infection (1), secondary loss of reduction (1) and plate removal due to patient will (1). In group III, complications were infection (1), delayed union and plate removal due to infection (1). The difference was non-significant (P=0.01).

DISCUSSION

The angle of the mandible (gonial angle) is located at the posterior border at the junction of the lower border of the ramus of the mandible. The angle of the mandible, which may be either inverted or everted, is marked by rough, oblique ridges on each side, for the attachment of the masseter laterally, and the pterygoideus internus (medial pterygoid muscle) medially; the stylomandibular ligament is attached to the angle between these muscles. The mandibular angle fracture is quite common and complications might occur due to treatment failure⁴. The present study was conducted to compare treatment modalities in the management of mandibular angle fractures.

In this study, out of 45 patients, males were 25 and females were 20. In group I patients, locking plates, in group II patients non-locking miniplates and in group III, bioresorbable plates were used. This is in agreement with Schierle et al.⁵ In group I and II, most of the patients were treated with transbuccal technique was used while in group III, intraoral technique was used. This is in accordance to Regevet al.⁶

We found that common complication in all group was infection. Other complications were delayed union, secondary loss of reduction and plate removal due to infection. In group I, 1 patient was of infection and in group II, 1 was of infection and 1 was of secondary loss of reduction. In group III, 1 was of infection and 1 was of delayed union. This is in accordance to Sugar et al.⁷

Ellis⁸ presented a 10-year experience of treatment methods for fractures of the mandibular angle. His review compared the following techniques: (1) closed reduction or intraoral open reduction and non rigid internal fixation, (2) extraoral open reduction and internal fixation using the internal fixation (AO/ASIF) reconstruction plate, (3) lag screws, (4) intraoral open reduction and internal fixation using two 2.0-mm dynamic compression plates. Results showed that the use of extraoral open reduction and internal fixation may be useful depending on the fracture and patient compliance.⁹

Mandibular angle fractures continue to present challenges to reconstructive surgeons. A thorough history, with investigation into the mechanism of trauma, along with a complete physical examination and proper radiographic assessment are the keys to the development of a satisfactory treatment plan for comprehensive management of these fractures.¹⁰

CONCLUSION

Common complications were infection, delayed union and loss of secondary reduction. There was no difference in complication in management with any of the techniques.

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Source of support: Nil

Conflict of interest: None declared

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