

Comparison of Transbuccal versus Transoral Approaches for Management of Mandibular Angle Fractures

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ABSTRACT

Background: The majority of mandibular fractures are angle fractures. A third molar, a smaller cross-sectional area, muscular tensions at the angle region, and a sudden change from horizontal to vertical rami form cause this event.

Objective: To compare the outcome of transbuccal versus transoral approach for management of mandibular angle fractures.

Study design: Quasi experimental

Place and duration of study: Department of Oral & Maxillofacial Surgery, Lahore Medical & Dental College, Lahore from 15th April 2020 to 15th October 2020.

Methodology: Ninety participants were enrolled and divided in two groups; transbuccal approach and transoral approach. Each group comprised 45 patients. An incision was made within the mouth using the transbuccal technique, beginning at the level of the maxillary occlusal plane and moving forward along the front border of the ascending ramus of the mandible. Additionally, the trocar was inserted across the mandibular angle area via a minor incision that was created outside the mouth, measuring 2-3mm. A 2.5 mm miniplate with four holes was used to straighten and stabilize the fracture. An incision was made only within the mouth using the transoral technique, beginning at the level of the maxillary occlusal plane, on the front edge of the ascending ramus of the mandible. A 2.5 mm 4-hole mini-plate was used to immobilize and secure the fracture segments.

Results: There were 31 (68.8%) males and 14 (31.2%) females in transbuccal approach while in transoral technique, 29 (64.4%) males and 16 (35.6%) females. Twenty two (48.9%) transbuccal and 19 (42.2%) transoral left mandibular angle fracture patients. Patients with excellent surgical access were 31 (68.8%) transbuccal and 19 (42.2%) transoral. Transbuccal averaged 83.89 minutes and transoral 81.51. Six (13.3%) transbuccal and 7 (15.5%) transoral individuals had similar occlusion. No group had significant difference in occlusion.

Conclusion: The trans-buccal method is advantageous for surgical access ($P < 0.05$ vs. trans-oral approach). Mean transoral surgical time was less than transbuccal, but not statistically significant.

Keywords: Mandibular angle fracture, Transoral approach, Transbuccal approach, Single miniplate.

INTRODUCTION

Mandibular fractures are the most prevalent type of maxillofacial fractures, with mandibular angle fractures accounting for nearly one third of these cases. The primary focus in managing mandibular angle fractures is to restore the anatomical structure and achieve proper bone fragment alignment. Various techniques for achieving this have been extensively discussed in the literature.^{1,2}

The mandible is located prominently on the face and it is therefore an easy target for both deliberate and accidental injuries. The thin cross-sectional area compared to the surrounding segments of the mandible, the curvature of the trajectories in the angle region, and the presence of third molars, especially impacted ones, which weaken the region, all contribute to the high incidence of angle fractures.^{3,4}

Furthermore, it requires effective fixation since it is the location with the highest number of complications.⁵ It is widely acknowledged that several complications (up to 32%) can be associated with angle fractures, in the form of infection, malunion, malocclusion, or facial nerve damage.⁶⁻⁸ Several methods for accessing the mandibular angle have been detailed, such as the usual percutaneous route, a combination of the intraoral and transbuccal approaches, and an external approach.⁹ Because the intraoral technique is not always accessible, surgeons have come up with alternate methods, one of them is the transbuccal approach.¹⁰

In the past, patients with mandibular angle fractures would

have open reduction and internal fixation using extraoral techniques. Although it offers greater exposure and direct application of plate fixation, it also runs the risk of damaging the facial nerve and leaving an unsightly scar. The benefit of the transbuccal method is that it reduces trauma to face and other anatomical features while allowing direct visualization of the occlusion during bone plate implantation, additionally, there is no visible scarring.¹¹

The purpose of this study is to provide a detailed account of a straightforward, uncomplicated, and secure method for surgically aligning and stabilizing a fractured mandibular angle. This was achieved by comparing the transbuccal approach with the transoral approach in the treatment of mandibular angle fractures.

MATERIALS AND METHODS

This quasi experimental study was conducted at Department of Oral & Maxillofacial Surgery, Lahore Medical & Dental College, Lahore from 15th April 2020 to 15th October 2020 and 90 patients were enrolled and divided in two groups; group A and group B. Each group comprised 45 patients. The demographic information (name, age, gender, fracture duration, anatomical side) of the patients were noted. In group A, mandibular angle fractures were treated transbuccally and in group B, a transoral incision was performed from the anterior border of the ascending ramus to the maxillary occlusal plane. By elevating a mucoperiosteal flap, the fracture site was exposed and stabilized with a 2.5mm 4-hole miniplate. Transbuccal approach included intraoral incision from ascending ramus anterior boundary at maxillary occlusal plane and a 2-3mm oral stab incision for trocar insertion. Mandible periosteum dissection revealed fracture location. Reduced and repaired

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fracture using 4-hole 2.5mm miniplate. According to operational definition, surgical access and time were recorded. All patients were followed-up in OPD. After 7 days, patients were evaluated for minor or major occlusion discrepancy. The data was entered and analyzed through SPSS-25. Chi-square and 't' test was applied. A p-value of less than 0.05 was considered significant when using chi square.

RESULTS

There were 31 (68.8%) males and 14 (31.2%) females in transbuccal approach while in transoral approach, 29 (64.4%) males and 16 (35.6%) females. Male to female ratios were 2.2:1 in transbuccal approach and 1.8:1 in transoral approach (Table 1).

In relation to the ease of surgical access, 31 patients (68.8%) having good, 13 patients (28%) fair and 1 patient (2.3%) has poor ease of surgical access according to the visual analogue scale in transbuccal approach. In transoral approach, 19 (42.2%) patients having good, 25 (55.5%) patients fair and 1 (2.3%) patient has poor ease of surgical access according to the visual analogue scale. Statistically the difference between transbuccal approach and transoral approach was significant ($P < 0.05$) [Table 2].

Six patients (13.3%) have minor occlusion discrepancy and 39 (86.7%) patients have no minor occlusion discrepancy in transbuccal approach while in transoral approach, 7 patients (15.5%) have minor occlusion discrepancy and 38 (84.5%) patients have no minor occlusion discrepancy. Statistically, there was no significant difference ($P = 0.764$) between the two approaches (Table 3).

The surgical time was 51-75 minutes in 9 (20%) patients of transbuccal approach and in 6 (13.4%) patients of transoral approach. The surgical time was 76-100 minutes in 36 (80%) patients in transbuccal approach and in 39 (86.6%) patients in transoral approach. The means of the surgical time was 83.89 ± 10.11 minutes in transbuccal approach and 81.51 ± 6.77 minutes in transoral approach. Statistically the difference was not significant ($P = 0.398$) [Table 4].

Table 1: Frequency and percentage of genders in both groups (n = 90)

Gender	Transbuccal Approach (n = 45)	Transoral Approach (n = 45)
Male	31 (68.8%)	29 (62.4%)
Female	14 (31.2%)	16 (35.6%)

Table 2: Frequency and percentage of ease of surgical access in both groups (n = 90)

Ease of surgical access	Transbuccal Approach (n = 45)	Transoral Approach (n = 45)
Good	31 (68.8%)	19 (42.2%)
Fair	13 (28.9%)	25 (55.5%)
Poor	1 (2.3%)	1 (2.3%)

$$\chi^2 = 6.669 \quad df = 2 \quad P = 0.036$$

Table 3: Frequency and percentage of minor occlusion discrepancy in both groups (n=90)

Minor occlusion discrepancy	Transbuccal Approach (n = 45)	Transoral Approach (n = 45)
Yes	6 (13.3%)	7 (15.5%)
No	39 (86.7%)	38 (84.5%)

$$\chi^2 = 0.090 \quad df = 1 \quad P = 0.764$$

Table 4: Frequency and percentage of surgical time in both groups (n=90)

Surgical time (minutes)	Transbuccal Approach (n = 45)	Transoral Approach (n = 45)
51 - 75	9 (20%)	6 (13.4%)
76 - 100	36 (80%)	39 (86.6%)
Mean \pm SD	83.89 \pm 10.11	81.51 \pm 6.77
P value	0.398	

DISCUSSION

The optimal method for managing mandibular angle fractures remains a subject of ongoing research and discussion.¹² It is

critical to understand the patterns and treatment of mandibular trauma so that injuries can be prevented and healthcare resources can be allocated properly.^{13,14} The objective of mandibular fracture fixation is to reestablish occlusion and temporomandibular joint functioning while minimizing disability and complications.⁹

Unfortunately, there is presently no acknowledged procedure for treating mandibular angle fractures, despite the fact that this sort of fracture is both widespread and difficult to cure.¹⁵ The supra-hyoid muscle group and the muscles responsible for chewing apply pressure on the angle of the jaw, causing the distal and proximal segments to rotate in an unstable manner. If a third molar is impacted and obstructs the fracture site, the bone may not be adequately exposed, and the fracture may become more complicated to treat, making it harder to achieve a perfect realignment of the fractured bone.¹⁶

Modern techniques and tools have made it possible to perform miniplate fixation via the transbuccal approach in a more anatomically advantageous location. Since there is a chance of damaging the facial nerve and leaving an unsightly scar, some surgeons avoid the transbuccal method.^{17,18}

The majority of patients in this research were male (66.67%), with just 33.33% being female. Consistent with the research carried out by Mustafa et al., our findings.¹⁹

The average age of the patients in the current research was 32.47 years and the ratio of males to females was 2:1, which is consistent with the study conducted by Sehrawat K et al.⁵

The findings of our investigation indicate that the transbuccal technique provided superior ease of surgical access compared to the transoral method ($P < 0.05$). This contrasts with the study done by Khandeparkar et al³ which revealed no significant difference between two groups.

There was no statistically significant disparity in the mean duration of the surgical operations, from the first incision to the final suture, between the transoral and transbuccal techniques. This outcome contradicts the conclusions of Sugar et al¹⁷ and Gear et al¹⁸ who documented a significant augmentation in the duration of surgery when using the transbuccal method in contrast to the transoral method.

Out of the total number of patients in our research, 6 individuals (13.3%) had a minor occlusion difference in the transbuccal approach, whereas 7 patients (15.5%) had a minor occlusion discrepancy in the transoral group. Statistically, there was no statistically significant difference ($P = 0.764$) seen between the two procedures. The findings are comparable to the research conducted by Campfort et al.²⁰

CONCLUSION

No technique is superior to other but descriptive statistics shows that transbuccal approach has few merits over ORIF with intraoral approach.

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