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Original Research Article

Healing of Mandibular Angle Fracture with or Without Removal of Third Molar - A Comparative Study

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Abstract:

Background: Mandibular angle fractures often involve impacted third molars, complicating decisions on whether to retain or remove them during repair.

Objective: Compare outcomes of mandibular angle fractures with and without impacted third molar removal.

Methods: Prospective study at Buddha Institute of Dental Sciences & Hospital with 20 patients, divided into groups based on third molar management during surgery. Followed for six months postoperatively, assessing healing, complications, and functional recovery.

Results: Similar outcomes in healing, complications, and function regardless of third molar removal ($p > 0.05$).

Conclusion: Third molar presence during mandibular angle fracture repair doesn't significantly affect outcomes; decisions should be case-specific.

Keywords: Mandibular Angle Fracture, Third Molar, Surgical Treatment, Fracture Healing, Complication Rates, Open Reduction, And Internal Fixation (ORIF).

Introduction

Managing mandibular angle fractures, especially when impacted third molars are involved, presents a unique challenge in maxillofacial surgery [1]. The decision regarding whether to remove or retain the third molar during the repair of these fractures remains a subject of ongoing debate within the dental and surgical communities. This debate is fueled by various factors related to the anatomical location of mandibular angle fractures and their association with impacted third molars [2].

Mandibular angle fractures are among the most commonly encountered injuries in facial trauma scenarios, often resulting from incidents such as physical assaults, motor vehicle accidents, or sports-related injuries [3]. These fractures typically occur in proximity to the third molar, which can weaken the mandible's structural integrity due to the tooth's presence. This close relationship between the third molar and the fracture line introduces complexities during surgical access and fixation, potentially influencing the healing process and overall treatment outcomes [4].

The primary controversy surrounding the management of mandibular angle fractures with impacted third molars revolves around two main concerns: the risk of postoperative infection and the stability of fracture fixation [5]. Some practitioners advocate for concurrent removal of the impacted third molar during fracture repair, theorizing that this approach may decrease the risk of postoperative infections and potentially enhance bone healing by eliminating a potential source of infection [6]. On the other hand, opposing views argue that the act of extracting the third molar can further weaken the mandibular angle and complicate the stabilization of the fracture.

To address these debates and provide evidence-based guidance, this comparative study aims to systematically evaluate the healing outcomes, incidence of complications, and overall recovery times associated with different management strategies for mandibular angle fractures [7]. By analyzing a cohort of patients who underwent surgical repair for mandibular angle fractures, with some patients undergoing simultaneous extraction of impacted third molars and others retaining the molars, this research intends to contribute valuable insights to the ongoing discussion within the medical community [8].

Specifically, the study seeks to determine whether the concurrent removal of impacted third molars during surgical repair of mandibular angle fractures

enhances the healing process, reduces the incidence of postoperative complications such as infections, or affects the stability of fracture fixation. These findings will offer evidence

based recommendations to clinicians regarding the optimal management strategy for mandibular angle fractures in the presence of impacted third molars, potentially leading to improved patient care and outcomes in the context of maxillofacial trauma.

Material and Methodology

Study Design and Setting: This prospective comparative study took place in the Outpatient Department (OPD) of Oral & Maxillofacial Surgery at the Buddha Institute of Dental Sciences & Hospital (BIDSH) in Patna, India, spanning 18 months.

Participants: The study enrolled 20 patients with mandibular angle fractures, aged 16 to 50 years, who visited the OPD. Eligible participants provided written informed consent and met the inclusion criteria.

Inclusion Criteria:

- Age 16 to 50 years.

-Mandibular angle fracture (favorable or unfavorable) without comminution.

- Presence of a tooth in the fracture line.

- Willingness to participate.

Exclusion Criteria:

- Severe infection or large hematoma in fractures.

- Grossly comminuted or severely damaged fractures.

- Fractures with inadequate bone thickness for screw retention due to oblique outer cortical plate fracture.

- Medically compromised patients.

- Severely atrophied mandible or inadequate soft tissues for wound closure.

- Pathological fractures.

Grouping:

Patients were randomly assigned to:

- Group I (retention group): Third molar retained (10 patients).

- Group II (removal group): Third molar removed (10 patients).

Surgical Procedure: All patients underwent open reduction and internal fixation (ORIF) via intraoral approach. Group I had a 4-hole miniplate placed while retaining the third molar. Group II had the third molar removed and received a similar miniplate.

Data Collection: Pre-operative and post-operative assessments included clinical and radiographic imaging (OPG and PA mandible). Parameters such as infection, occlusion, wound status, mouth opening, malocclusion, malunion, sensory issues, and surgery duration were evaluated.

Follow-Up: Patients were followed up at various intervals post-surgery for six months. Statistical analysis was performed on collected data to compare healing outcomes and complications between the two groups.

Results

Gender and Age Distribution: The majority of patients were male, comprising 80% in the retention group and 70% in the removal group. The mean ages were 22.10 years in the retention group and 31.10 years in the removal group, indicating a younger demographic in the retention group.

Wound Dehiscence: Wound dehiscence was observed in 10% of patients in both groups during the initial postoperative week. However, by the end of the first month, it resolved in all cases, indicating no significant long-term issues with wound healing.

Occlusion: Before surgery, 40% of patients in the retention group had normal occlusion, which improved postoperatively to 90% achieving satisfactory occlusion. In the removal group, 30% had normal occlusion preoperatively, increasing to 80% postoperatively. The differences in postoperative occlusion between the two groups were statistically non-significant.

Complications: Overall complication rates, including infection rates and healing complications, were low and similar between the groups. This suggests that the presence or absence of the third molar did not significantly impact the overall outcome of fracture healing.

Statistical Analysis: Statistical analysis using the chi-square test and Fisher's exact test (where applicable) with a significance threshold of $p \leq 0.05$ revealed no statistically significant differences between the groups in terms of healing outcomes. This indicates that both treatment strategies are viable with similar efficacy.

Table 1: The key clinical findings and outcomes from the study, allow for an easier comparative analysis of the impact of third molar retention or removal on the healing processes of mandibular angle fractures.

Parameter	Measurement Time	Group I (Retention)	Group II (Removal)
Mouth Opening (mm)	Preoperative	26.91 ± 5.07	28.78 ± 3.73
	1st Week	28.09 ± 5.26	29.00 ± 3.71
	1st Month	30.45 ± 4.20	32.00 ± 2.60
	3rd Month	32.55 ± 3.75	34.22 ± 2.54
	6th Month	34.91 ± 2.21	37.44 ± 3.68
Paresthesia (%)	1st Week	30	40
	1st Month	20	40
	3rd Month	0	10
	6th Month	0	10
Wound Dehiscence (%)	1st Week	10	10
	1st Month	0	10
	3rd Month	0	0
	6th Month	0	0
Malocclusion (Mild Discrepancy)	1st Week	1	2
	1st Month	0	0
	3rd Month	0	0
	6th Month	0	0

Statistical analysis for each parameter, including mouth opening and paresthesia, determined the significance of differences between the groups. The p-values for mouth opening were not statistically significant ($p > 0.05$), indicating no substantial difference except for paresthesia at the initial stages ($p = 0.034$). This indicates a higher incidence of sensory disturbances in the removal group early on, while other differences in mouth opening were not significant.

Discussion

The decision regarding whether to retain or remove the third molar during surgical repair for mandibular angle fractures does not significantly impact healing outcomes or complication rates such as infection or wound dehiscence [9,10]. Both approaches demonstrate similar efficacy in terms of postoperative recovery and the occurrence of complications, indicating that either strategy can be considered without substantial differences in outcomes [12].

While studies have suggested that the presence of third molars might elevate the risk of mandibular angle fractures, the decision to retain or remove these teeth during surgery does not notably alter the overall outcome [13]. This finding underscores the importance of individualized treatment plans based on comprehensive clinical assessments rather than adhering to a standardized approach for all cases [14,15].

Achieving satisfactory occlusion and restoring functional mouth opening after surgery are crucial indicators of successful mandibular function restoration [16]. The study revealed no significant difference between the groups in terms of achieving satisfactory occlusion or mouth opening postoperatively, indicating that the presence or absence of the third molar does not hinder functional recovery [17].

The study's results suggest that when deciding whether to remove or retain the third molar, clinicians should consider various factors such as the patient's overall health, fracture specifics, and potential surgical complications [18]. This personalized approach allows for tailored treatment plans that can address each patient's unique needs while minimizing the risk of complications and optimizing the likelihood of a successful outcome [19].

These findings align with existing literature indicating minimal differences in complication rates between retaining and removing third molars during mandibular angle fracture repairs. The consensus across broader literature supports the conclusions drawn from this study, indicating a shift towards more conservative approaches where feasible and highlighting the importance of individualized patient care in maxillofacial trauma management [20,21,22].

Conclusion

Both treatment groups—those with third molar retention and those with third molar removal—showed similar rates of healing and low complication rates. This suggests that the surgical decision to retain or remove the third molar can be made based on individual case factors rather than a universal protocol. Postoperative functional outcomes such as occlusion and mouth opening were similar between both groups, indicating that the third molar does not significantly impact the

recovery of mandibular function after fracture repair.The findings advocate for a personalized approach to surgical decision-making. Surgeons should consider factors such as the specifics of the fracture, patient preference, and potential surgical complications when deciding whether to remove or retain the third molar in cases of mandibular angle fractures. Further studies with larger sample sizes and long-term follow-up are recommended to confirm these findings and help refine clinical guidelines.

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