

# Frequency of Infection after Extraction of Involved Third Molar in Mandibular Angle Fractures Treated with Rigid Fixation

Asad Aizaz Chatha,<sup>1</sup> Salman Tahir,<sup>2</sup> Riaz Ahmad Warraich,<sup>3</sup> Saba Hanif,<sup>4</sup> Nabeela Riaz<sup>5</sup>  
Shammas Raza Khan,<sup>6</sup> Uzair Bin Akhtar<sup>7</sup>

## Abstract

**Objective:** To determine the frequency of post-operative infection in patients with mandibular angle fractures treated with rigid fixation after extraction of involved third molar.

**Materials and Methods:** In a total of 100 patients undergoing open reduction and internal fixation of mandibular angle fractures in which involved third molar will be extracted were included from Department of Oral and Maxillofacial Surgery, Mayo Hospital, Lahore. Procedure was performed by the same consultant and post operatively patients were assessed by two post graduate trainees who were trained pre-

viously to check Infection, on 1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> weeks post operatively. All the observations were entered on preformed proforma. Data was entered & analyzed by using SPSS version 10.0

**Results:** According to this study, the mean age of patients was 33.22 + 9.155 years. Minimum and maximum age of patients was 18 years and 50 years with range of 32 years. There were 83 (83.0%) male patients while only 17 (17%) female patients presented with mandibular angle fractures. The rate of infection at week 1 was higher [9 (9.0%) cases], but gradually decreased in next follow up. 8 (8.0%) at 2<sup>nd</sup> week, 7 (7.0%) at week 4 and only 6 (6.0%) in last follow up at week 6 after open reduction and internal fixation of mandibular angle fractures with extraction of third molar.

**Conclusion:** The frequency of post-operative infection in patients with mandibular angle fractures treated

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Chatha A.A.<sup>1</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

Tahir S.<sup>2</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

Warraich R.A.<sup>3</sup>

Former Professor, Department of Oral and Maxillofacial  
Surgery, Mayo Hospital, Lahore

Hanif S.<sup>4</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

Riaz N.<sup>5</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

Khan S.R.<sup>6</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

Akhtar U.B.<sup>7</sup>

Department of Oral and Maxillofacial Surgery  
Mayo Hospital, Lahore

with rigid fixation after extraction of third molar was 30% at different follow ups in which 9% patients had infection at first week, 8 patients had at 2<sup>nd</sup> week, 7 patients had at 6th week and 6% patients presented with infection at last follow up. Overall the infection rate is lower in patients with mandibular angle fractures treated with rigid fixation after extraction of third molar.

**Key words:** Angle mandibular fracture, third molar and maxillofacial infection.

## Introduction

Maxillofacial trauma is one of the major cause of mortality and morbidity worldwide.<sup>1</sup> The mandible is fractured more commonly than other bones of facial skeleton, account for 36% to 54% of all maxillofacial trauma.<sup>2</sup> In mandibular fractures most common site is angle of mandible, which accounts for 20 – 30%.<sup>3</sup> Mandibular involvement could be related to its prominent position and exposed situation. The strength of the mandible is determined by various factors such as the presence of active and strong musculature, the shape and thickness of bone, and the presence or absence of teeth. Neal et al found that 50% of fracture mandible involves areas of teeth.<sup>4,5</sup>

Complications following the treatment of mandibular fractures such as infection and mal-union were historically attributed to the presence of the tooth involvement in the fracture line.<sup>6,7</sup> Apart from conservative measures, several surgical methods may be applied to treat the mandibular angle fractures.<sup>8-10</sup> Current trends use a variety and combination of trans-orally placed small plates secured with mono-cortical screws for the fixation of angle fractures.<sup>1,3</sup> Several studies have shown that the mandibular fracture that has the highest incidence of postoperative complications is fracture of the angle. The possible reasons for this are many and include the method of treatment, the time between injury and treatment, the oral health of the patient, and the presence or absence of a tooth in the line of fracture. Ramakrishnan found that incident of infection was 25% after extraction and incident of infection was 30% when tooth was retained in mandibular angle fractures treated with rigid fixation.<sup>7</sup>

Ellis found infection rate of 19.0% after extraction of involved third molar in mandibular angle fractures treated with rigid fixation. Third molar tooth is usually involved in the fracture line when angle of the mandible is fractured hence, it is of utmost importance to

consider this area and tooth involvement. Rigid fixation with miniplates is considered to be the best option when it comes to open surgical treatment of angle of the mandible.<sup>11</sup>

International studies shows that the difference in postoperative infection between retention and extraction is not significant but keeping in mind the oral hygiene, poor nutritional status and poor compliance in our patients, the purpose of my study is to collect data of the frequency of infection in mandibular angle fractures treated with rigid fixations after extraction of involved third molar.

As limited data is available nationally with this reference, the outcome of this study will help us in identifying the magnitude of infection related to extraction of third molar tooth in mandibular angle fractures. This will further allow us to decide whether the involved tooth should be retained or extracted.

## Materials and Methods

In a total of 100 patients undergoing open reduction and internal fixation of mandibular angle fractures in which involved third molar will be extracted were included from Department of Oral and Maxillofacial Surgery, Mayo Hospital, Lahore. Procedure was performed by the same consultant and post operatively patients were assessed by two post graduate trainees who were trained previously to check Infection, on 1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup> and 6<sup>th</sup> weeks post operatively. All the observations were entered on preformed proforma. Data was entered and analyzed by using SPSS version 10.0. Mean and standard deviation was calculated for quantitative variables like age. Qualitative data like infection was presented as frequency and percentages.

## Results

According to this study, the mean age of patients was 33.22 + 9.155 years. Minimum and maximum age of patients was 18 years and 50 years with range of 32 years.

In this study, there were 26 (26.0%) cases in age range 18 – 26, 28 (28.0%) cases in age range 27 – 34, 25 (25.0%) cases in 35 – 42 age range and 21 (21.0%) cases in 43 – 50 age range (Table 1).

In this study, there were 83 (83.0%) male patients while only 17 (17%) female patients presented with mandibular angle fractures (Table 2). The rate of

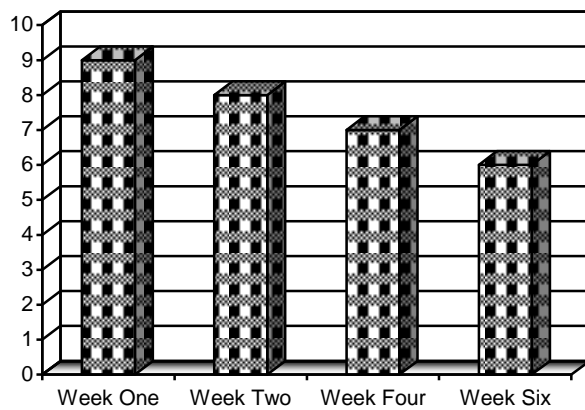
infection at week 1 was higher [9 (9.0%) cases], but gradually decreased in next follow up. 8 (8.0%) at 2nd week, 7 (7.0%) at week 4 and only 6 (6.0%) in last follow up at week 6 after open reduction and internal fixation of mandibular angle fractures with extraction of third molar (Table 3). In this study, the total infection rate observed was in 30 (30.0%) cases while 70 (70.0%) cases no infection was observed (Table 4).

**Table 1:** Distribution of patients according to age groups.

		Frequency	Percent
Age groups	18 – 26	26	26.0%
	27 – 34	28	28.0%
	35 – 42	25	25.0%
	43 – 50	21	21.0%
	Total	100	100.0%

**Table 2:** Distribution of gender (n = 100).

		Frequency	Percent
Gender	Male	83	83.0%
	Female	17	17.0%
	Total	100	100.0%



**Fig. 1:** Infection seen in follow-up.

**Table 3:** Distribution of infection in patients during follow-up.

		Week 1	Week 2	Week 4	Week 6
Infection	Present	9 (9.0%)	8 (8.0%)	7 (7.0%)	6 (6.0%)
	Absent	91 (91.0%)	92 (92.0%)	93 (93.0%)	94 (94.0%)
	Total	100	100	100	100

## Discussion

Over the last several years, the introduction of new plating systems has greatly facilitated achieving a stable rigid fixation of mandibular fractures and its reduction in the required period of post surgical immobilization.<sup>12,13</sup> Unfortunately, fractures of the mandible are associated with a significant number of complications. Infection, malocclusion, mal-union and neuro-sensory dysfunction are the most common complication of mandibular fractures and their treatment.<sup>14</sup> According to our study, the mean age of patients was 33.22 + 9.155 years. Minimum and maximum age of patients was 18 years and 50 years with range of 32 years. A study conducted by Ramakrishnan J, the mean age of patients was 32 years with age range of 17 – 62 years.<sup>7</sup> Almost patients of same mean age were observed in other studies. According to Inaoka SD study the mean age was 26.35years with age range of 16 – 55 years<sup>1-3</sup> and from study of Holmos DR the mean age was 30.6 + 10.4 years.<sup>1</sup> According to our study, the largest percentage of patients was found in age range 27 – 34 years (28.0%). According to Inoaka study, the largest percentage (46.5%) was in the 21 – 30 years age group.<sup>15</sup> In this study, there were 83 (83.0%) male patients while only 17 (17%) female patients presented with mandibular angle fractures. In Ramakrishnan study there were 88% males and 12% females in the study group.<sup>7</sup> According to Inaoka study there were 88.4% male patients and only 11.6% females in the study group.<sup>15</sup> This ratio was also observed in the study of Holmos, there were 80.1% male patients and remaining were female patients.<sup>16</sup> The rate of infection at week 1 was higher [9 (9.0%) cases], but gradually decreased in next follow up. 8 (8.0%) at 2nd week, 7 (7.0%) at week 4 and only 6 (6.0%) in last follow up at week 6 after open reduction and internal fixation of mandibular angle fractures with extraction of third molar. In this study, the total infection rate observed was in 30 (30.0%) cases while 70 (70.0%) cases no infection was observed. According to Ramakrishnan study the occurrence of minor complications (the rate of postoperative infection) was 9.6% and 9.7% for patients with and without tooth involvement,

**Table 4:** Distribution of infection observed in the study.

		Frequency	Percent
Infection	Present	30	30.0%
	Absent	70	70.0%
	Total	100	100.0%

respectively.<sup>7</sup> According to study of Ellis E III, the rate of infection when the tooth was retained, the incidence of infection was 19.5%. When the tooth was removed, the incidence of post-operative infection was 19.0% (p = NS).

According to this study, there was an increased risk for postoperative complications when a tooth is present, but the increase was not statistically significant. The incidence of postoperative infection and / or the need for plate removal was not affected by whether the tooth in the fracture is removed.<sup>11</sup>

## Conclusion

The frequency of post-operative infection in patients with mandibular angle fractures treated with rigid fixation after extraction of third molar was 30% at different follow ups in which 9% patients had infection at first week, 8 patients had at 2nd week, 7 patients had at 6<sup>th</sup> week and 6% patients presented with infection at last follow-up. Overall the infection rate is lower in patients with mandibular angle fractures treated with rigid fixation after extraction of third molar.

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