# Relationship between Fractures of Mandibular Angle and the Presence of a Lower Third Molar

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# Relationship between Fractures of Mandibular Angle and the Presence of a Lower Third Molar

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## *ABSTRACT:*

**Objectives:** In this retrospective study, we measured the relationship between the presences of a lower third molar and mandibular angle fractures.

**Patients &Methods:** The records and radiographs of 50 patients with mandibular angle fracture were examined. The presence of a lower third molar were assessed for each patient and related to the occurrence of mandibular angle fracture.

**Results:** Patients with presence of a lower third molar exhibited three times greater chance of a mandibular angle fracture than patients with absent lower third molar. There was a major variation in the risk for a mandibular angle fracture depending on presence of a lower third molar.

**Conclusion:** The presence of third molar teeth provides an area of potential weakness of the mandible and predisposes the angle region to fracture & difficulty to achieve good reduction and exposes the fracture for many complications like postoperative infections and delayed healing. Fights accounted for the largest number of fractures, and accidents was higher in males than in females.

## *Introduction:*

Fracture of the jaw plays an important role in the practice of the oral surgeon. The mandible is the most common of the facial bones to fracture. This is due to it is relatively prominent position in relation to common injuring forces [1-4]. Several authors have reported that the presence of teeth may be one of the determinants of mandibular fractures. Similarly, the incidence, treatment methods, healing rate, and post-treatment

complications of these fractures also may be influenced to a greater or lesser degree by the state of dentition [5, 6].

In the words of Halozenetis, "Weak regions of the mandible have not been adequately determined. However, it has been suggested that the presence of third molar teeth may decrease the resistance of the mandibular angle region to fracture "[7].

The results of other studies confirm that patients with lower third molar present have an increased risk for angle fractures. Furthermore, it also showed that the risk for an angle fracture varied depending on lower third molar position [8-12].

Kim concluded that the mandibular angle that has a lower third molar is more susceptible to fracture when exposed to an impact than an angle without a lower third molar [13]. The result of the retrospective investigation that was done by Lida et al showed that an incompletely erupted lower third molar decreases the risk of condylar fractures and increases the risk of mandibular angle fractures.[14]

The aim of this study was to compare some of the clinical aspects of dentulous mandibular fractures and examine the effect of presence of lower third molars on the incidence of mandibular angle fractures.

## *Patients &Methods:*

This study was a retrospective investigation that used patient records and radiographs as data sources. Fifty dentulous patients (43 male and 7 female, the age range was from 19-48 years with average age 24 years) with mandibular fractures treated by intermaxillary and rigid fixation at the Al-Azhar University Hospitals during the period from 2001-2006.

The medical records and panoramic radiographs, C.T and 3D C.T (figures 1-4) of 50 patients with mandibular angle fractures were examined. The presence and absence and degree of impaction of the lower third molar were assessed for each patient and related to the occurrence of fracture of the mandibular angle in addition to evaluate the degree of displacement of the fracture.

. Data were also collected for age, sex and mechanism of injury.

Each fracture was divided into two groups.

**Group I**: Consisted of mandibular angle fractures associated with presence of lower third molar.

**Group II: C**onsisted of mandibular angle fractures not associated with presence of lower third molar.

Fig 1: 3D C.T of displaced mandibular angle fracture

Fig 2: Coronal C.T of displaced angle fracture associated with impacted lower third molar

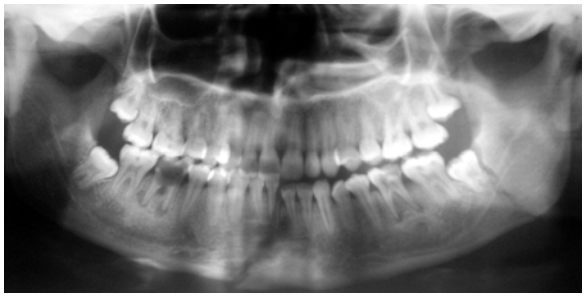

Fig 3: Panoramic radiograph of angle fracture associated with third molar.

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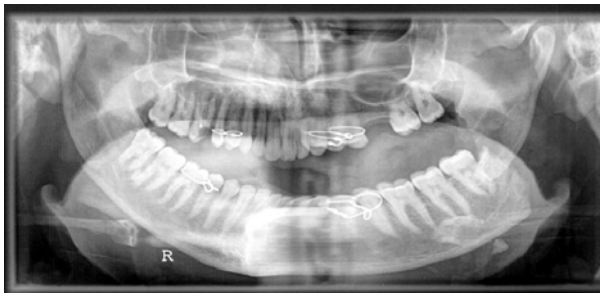

Fig 4: Panoramic radiograph of bilateral angle fracture (sever displacement of the left , side not associated with third molar)

## *Results:*

The incidence of mandibular angle fracture was found to be greater when a lower third molar was present. Patients exhibiting angle fractures associated with third molar represented 74 % of all angle fractures in this investigation.

The numbers of patients and methods of fixation in both groups is shown in Table 1.

Table 1: Number of patients and methods of fixation among the groups

| Groups | Group I | Group II |
|---|---|---|
| No of patients | 37 (74 %) | 13 (26 %) |
| Methods of fixation | Rigid internal fixation | Rigid internal fixation |

There was a considerable difference in the sex distribution and in the causes of fractures between those with and without third molar teeth. Different causes and the distribution of sex and age are shown in Table 2.

Table 2: causes and the distribution of sex and age within the groups

| Variables | Group I | Group II |
|---|---|---|
| Female | 5 | 2 |
| Male | 32 | 11 |
| Age | 19-35 Y | 24- 48 Y |
| Causes | | |
| Falls | 5 | 1 |
| Fight | 20 | 9 |
| Motor car accident | 11 | 3 |
| Sports | 1 | - |

In our study, there was a considerable difference in the sex distribution and in the causes of fractures between those with and without third molar teeth, with fight representing 58% of all mandibular fracture and more with male patients.

Also, there was a difference in the age distribution between the two groups as group I was associated with younger age.

In this study, 7 cases associated with impacted third molar represented sever displacement of the angle fracture (figure 1, 2) and interfered with achievement of reduction. In four cases, extraction of the impacted lower third molar was done to achieve good reduction at the fracture site. The remaining three cases that were treated without extraction of the lower third molar required more time to obtained good reduction (time range from 30-45 minutes) and exhibited postoperative infection and delayed healing in the fracture site and underwent a second operation for removal of the lower third molar.

Only two cases without lower third molar in the fracture site represented sever displacement of the angle fracture (figure 4).

## *DISCUSSION:*

Angle fractures were caused mainly by assault, although this is perhaps not the case for the elderly who do not frequently get involved in fights [15-16].

Wolujewicz [17] addressed the issue of buried teeth within the angle region as a predisposing factor to its weakness and concluded that there was no relationship between the state of eruption of the respective lower third molar and the incidence of angle fractures.

Oikarinen and Malmstrom [18] showed that the region of the angle was involved in more than 17% of all maxillofacial fractures in a series of 1248 cases reviewed.

Halozenetis [7] stated that angle fractures are twice as likely to occur in dentate patients compared with edentulous persons. More recently, this was confirmed by Amaratunga [5].Neither of these last two authors made specific reference to the presence or absence of third molar teeth in fractures of the angle of the mandible.

As for age ;Oikarinen and Malmstrom [18] reported a peak incidence of angle fractures in the 20 to 29 year age group. This figure is supported by data provided by Ueno et al. and Ellis et al.

Halozenetis showed that between the age of 12 to 29 years, 69% of single mandibular fractures occurred at the angle and this because that time is time for formation of the lower third molar tooth follicle and eruption of the tooth[7,8]. This investigation presented clinical evidence that third molars weaken the angle of the mandible predisposing to fracture [19-21]

In this study, mandibular angle fracture associated with lower third molar represented 74 % of all cases and this result provided an evidence that third molar tooth represents a weak point of the mandible that lowers the resistance of the bone to fracture. This result is in agreement with the result of researches of Lee et al ,Ugboko et al ,Joyce et al, Kim and Linda et al [10-14] .

In our study, the presence of completely impacted lower third molar provided more risk not only to the fracture but also to degree of the displacement of the fracture site because the tooth occupies more osseous space which could affect the postoperative result. This result agreed with the result of the study that was done by Reitzik et al [22]

## *Conclusion:*

The results of the present study provide data to support the commonly held view that the presence of third molar teeth provide an area of potential weakness of the mandible and predispose the angle region to fracture and exposes the fracture for many complications like postoperative infections and delayed healing. Fights accounted for the largest number of fractures .In our study; the number of fractures of the mandible caused by fights and accidents was higher in males than in females.

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