

**Radiographic study of mandibular
angular cortical thickness in relation to
the presence and eruption status of
mandibular third molar**

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ABSTRACT

Anatomically, mandible is one of the largest and strongest facial bones but there are some areas, which are physically weak and fractured easily due to trauma, i.e., angle and condyle.

In addition to various factors affecting the angular susceptibility to fracture; Recent studies demonstrated the correlation of the risk of mandibular angle fractures to the presence of the mandibular third molars, such phenomenon is most evident when the third molars are impacted.

The aim of the present study is the evaluation of mandibular angular cortical thickness in relation to the presence and eruption status of mandibular third molar using digital panoramic imaging system to verify if the mandibular third molar represent a risk factor for angular fracture or not.

This study was conducted on 160 Iraqi subjects from both gender aged from (20-28) years, they were divided equally into four groups according to the status of mandibular third molar and as follows:

1. Subjects with agenesis of mandibular third molar.
2. Subjects with completely erupted mandibular third molar.
3. Subjects with complete bony impacted mandibular third molar.
4. Subjects with extracted mandibular third molar with the duration of extraction.

With digital panoramic image, the angular cortical thickness was measured on both right and left sides for all study groups using tracing elements. The collected data were processed and analyzed using SPSS package program (version 13) .

The mean of angular cortical thickness showed a statistically significant difference among the four study groups participated in this study ($p < 0.001$). Subjects with agenesis registered the greatest value in the mean angular cortical

thickness (2.15 mm) followed by subjects with extracted third molar (1.84 mm), completely erupted (1.61 mm) and complete bony impacted mandibular third molar (1.33 mm) respectively. On the other hand angulation of impacted third molar play no significant role in reduction of the angular cortical thickness. Extraction of mandibular third molar was found to be associated with higher angular cortical thickness than completely erupted and complete bony impacted third molar and this effect showed statistically as a strong positive linear correlation with the duration of extraction (female $r = 0.895$, male $r = 0.969$, total analyzing sample $r = 0.855$). The angular cortical thickness showed a statistically significant strong positive linear correlation with age in agenesis ($r = 0.931$), completely erupted ($r = 0.78$) and complete bony impacted third molar ($r = 0.944$) study groups, while it showed a statistically significant moderate positive linear correlation with age in extracted third molar study group ($r = 0.538$). Regarding to the gender, there was a statistically non significant difference in mean angular cortical thickness between female and male in subjects with agenesis ($p\text{-value}=0.34$) and extracted mandibular third molar ($p\text{-value}=0.27$), while male showed a significantly higher angular cortical thickness than female in both completely erupted and complete bony impacted mandibular third molar subjects with ($p\text{-value}<0.001$).

It was concluded that the measurement of the angular cortical thickness was greatly affected by the presence and eruption status of mandibular third molar, such measurements registered its highest values in subjects with agenesis of mandibular third molar and its lowest values in subjects with complete bony impacted third molar. Our results supported the hypothesis which stated that the presence of impacted mandibular third molar increase the risk factor of angular fracture .