

Pattern of mandibular third molar impaction in patients attended the Hawler College of Dentistry: a retrospective radiographic study

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ABSTRACT

Background and Objectives: The aim of this study was to assess radiographically the angulations and depth of impacted mandibular third molars.

Methods: In a retrospective study 163 impacted mandibular third molars of 100 patients were examined on orthopantomograms (OPT) in the College of Dentistry/ Hawler Medical University during 2008. From these orthopantomograms the angulations (mesioangular, distoangular, vertical, and horizontal) and the depth (types A, B, and C) of the impacted mandibular third molars were recorded. The frequencies of unilateral and bilateral impaction were also recorded.

Results: The average age of the patients was 26.5 ± 5 ranging from 20-40 years with a median of 25 years. Fifty eight (58%) of the cases were female and 42 (42%) were male. The frequency of mesioangular, distoangular, vertical and horizontal impactions were 73 (44.8%), 37 (22.6%), 28 (17.2%), and 25(15.4%) successively. The depths of the impactions were 45 (27.6%) depth A, 74 (45.4%) depth B, and 44 (27%) depth C. The frequency of unilateral impaction was 26 (26%) and that of bilateral impaction was 74 (74%).

Conclusions: Impacted mandibular third molars are more common in female. Mesioangular impaction is more common followed by distoangular. Depth B most common and most of the patients have bilateral impaction.

Key words: Mandibular third molar, impaction, orthopantomogram

INTRODUCTION:

The third molar is the most frequently impacted tooth, with a frequency of occurrence generally reported to be from 18 to 32%.¹ The average age for eruption of the third molars is 20 years, although eruption may continue in some patients until the age of 25 years.² The number of people reaching adult life with impacted third molars seems to be increasing to an epidemic extent.³ The prevalence of mandibular third molar impactions is also variable in different populations, ranging from nil in Nigerians⁴ to 72% in Swedish⁵. Some studies reported no difference in the prevalence rate of impacted third molars between males and females^{4,5}. Others reported female predominance⁶⁻⁹. The studies of Quek et al¹⁰,

Schroeder et al¹¹, Stanley et al¹² showed that mesioangular impactions were the most common, followed by horizontal and vertical impactions. Others like Sasano et al¹³, Venta et al⁶ found vertical impactions to be the most common variant which was followed by horizontal impactions. The angulation of impaction of the mandibular third molar was determined by the angle formed between the intersected longitudinal axes of the second and third molar. A system of measurement using an orthodontic protractor was incorporated to reduce errors arising from visual impression alone, was introduced by Quek et al.¹⁰ in which the following classification was adopted for angulations

1. Vertical impaction: 10° to 10°
2. Mesioangular impaction: 11° to 79°

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3. Horizontal impaction: 80° to 100°
4. Distoangular impaction: $_11^\circ$ to $_79^\circ$
5. Others: 111° to 80°
6. Buccolingual impaction

Regarding the depth of impaction of mandibular third molar the following classification was adopted

1. Level A: Not buried by bone.
2. Level B: Partially buried by bone. (If any part of the cemento-enamel junction was lower than the bone level, the tooth was considered to be partially buried by bone.)
- iii. Level C: Completely buried by bone.

Third molars exhibit great variation in size, shape, position, root formation, time of development, and path of eruption². However, the criteria for eruption used in most studies was the emergence of any part of the crown through the oral mucosa. This may give misleading results because many of the third molars do not continue to erupt but remain impacted in a partially erupted position. In addition to racial variance, factors influencing the timing of third molar eruption include nature of the diet causing attrition, reduction in mesiodistal crown diameter, degree of use of the masticatory apparatus, and genetic inheritance¹⁴. The aim of this retrospective radiographic study was to investigate the angulations and depths of impacted mandibular third molars.

MATERIAL AND METHOD :

In a retrospective study, 163 impacted mandibular third molars of 100 patients seen in the College of Dentistry/ Hawler Medical University during 2008 were examined on orthopantomograms (OPT). Any case with incomplete root formation was not involved in the study. From these orthopantomograms the angulations (mesioangular, distoangular, vertical, and horizontal) were determined by the angle formed between the intersected longitudinal axes of the second and third molars, (Figure 1). The depths of the impacted mandibular third molars were recorded (types A, B, and C). The level of impaction

of the crown of the third molar was considered in relation to bone and the cemento-enamel junction of the impacted tooth as follow, See (Figure 2):

1. Level A: Not buried by bone.
2. Level B: Partially buried by bone. (If any part of the cemento-enamel junction was lower than the bone level, the tooth was considered to be partially buried by bone.)
3. Level C: Completely buried by bone.

We used the same classifications for angulations and depth that used by Quek et al.¹⁰ The frequency of unilateral and bilateral impaction was also recorded.

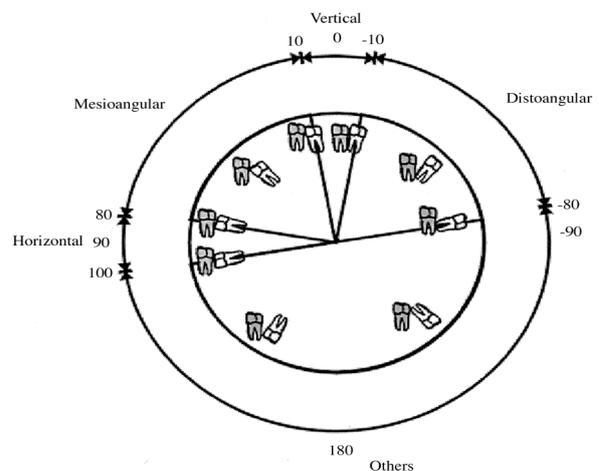


Figure 1: Classification of angulation of impaction.

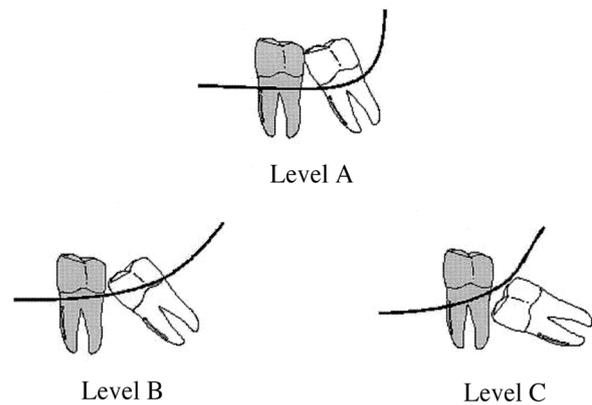


Figure 2: Classification of depth of impaction

RESULT:

The average age of the patients was 26.5 ± 5 ranging from 20-40 years with a median of 25 years. Fifty eight (58%) of the cases were female and 42 (42%) were male. The frequency of mesioangular, distoangular, vertical and horizontal impactions were 73 (44.8%), 37 (22.6%), 28 (17.2%), and 25 (15.4%) successively, (Figure 3). The depths of the impactions were 45 (27.6%) depth A, 74 (45.4%) depth B, and 44 (27%) depth C, (Figure 4). The frequency of unilateral impaction was 26 (26%) and that of bilateral impaction was 74 (74%).

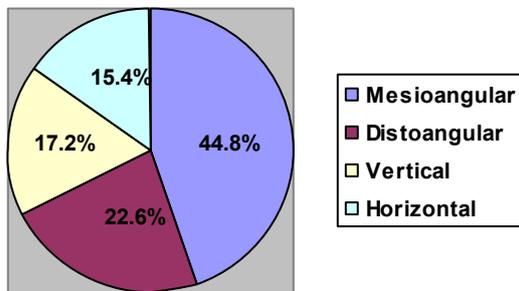


Figure 3: Frequency of angulations.

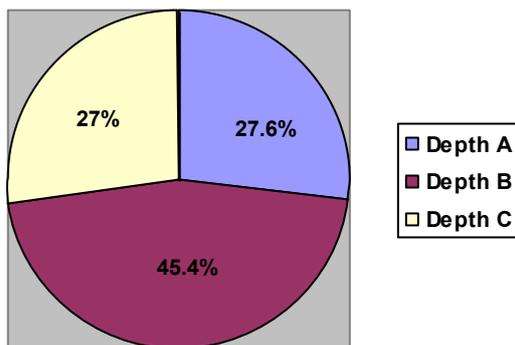


Figure 4: Frequency of depth

DISCUSSION:

Predictions of impaction or eruption of third molars before the age of 20 years may be inaccurate because of positional changes of these molars during further development.¹⁵ The 20 to 40 year age group was used as growth is essentially completed within this age group¹⁴. The upper limit of 40 years was used as beyond this age, it is more likely that most third molars may have been extracted⁶. In our study we found greater frequency of impacted mandibular third molars in female than male and were similar to that reported by Hugoson and Kulberg⁶, Murtomaa et al⁷. Hellman (cited)¹⁰ proposed that the higher frequency of impacted third molars in females is a consequence of their jaws that stop growing when the third molars just began to erupt, whereas in males, the growth of the jaws continue beyond the time of eruption of the third molars. It is difficult to compare the prevalence of the different angulations of impaction, as classification systems vary across different studies. Furthermore, most studies measured angulation of impaction by visual impression alone. Hence, results obtained from one study were not comparable to another. In our study, we found that mesioangular impaction of the mandibular third molar was the most common (44.8%) followed by distoangular impaction (22.6). With regard to frequency of mesioangular impaction, our result was similar to that reported by Quek et al¹⁰, Schroeder et al¹¹ and Stanley et al¹². Distoangular impaction was the second most common type of impaction and we found no similar result in any study. This difference might be due to difference in genetic background, racial difference and different socioeconomic status. Similar to the result of Quek et al¹⁰, our study showed that bilateral impaction was more common.

CONCLUSIONS :

Impacted mandibular third molars are more common in female. Mesioangular impaction is more common followed by distoangular. Depth B most common and most of the patients have bilateral impaction.

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