

## Prevalence of impacted third molars in Jeddah, Saudi Arabia: a retrospective study

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**Abstract: Objective:** Tooth impaction, especially of the third molars, is among the more commonly encountered dental conditions. Yet many impacted third molars remain undetected because they are usually asymptomatic. Despite their asymptomatic status, when impacted third molars are detected, the recommended approach is usually surgical removal to prevent development of future complications and/or pathologic conditions. The aim of this study was to determine the prevalence of impacted third molars in the Saudi population in Jeddah, and to establish which third molar is more commonly impacted and the more commonly encountered angulation of impaction. **Methods:** The study was a cross sectional retrospective one where the electronic records of new patients attending the dental hospital at King Abdulaziz University over a two year period were reviewed. The sample size included four thousand patients for whom data regarding their third molars was collected from their dental charts and panoramic radiographs. **Results:** The prevalence of impacted third molar teeth in a sample of the Saudi population in Jeddah is estimated at 19.2%. Mandibular third molars were much more commonly impacted than maxillary ones and they were more often than not mesioangular in position. **Conclusion:** Panoramic radiographs should be examined for closely for impacted third molars as they are a relatively common dental anomaly.

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**Keywords:** Impacted third molar tooth; impacted third molar; prevalence; Saudi population.

### 1. Introduction

Tooth eruption is a complex process that is not fully understood.(3, 4) It is made up of a series of physical and biological events that are synchronized with the growth of the jaws.(3, 4) Local as well as systemic factors influence this complex process.(3, 4) However, a number of complications may arise during the eruption process and result in impaction. An impacted tooth is defined as “one that cannot and will not assume a normal functioning position and is therefore pathologic and requires treatment”.(5)

The third molar is the last permanent tooth to erupt into the oral cavity and is the most commonly impacted tooth.(1, 5) Most impacted third molars are asymptomatic and remain unnoticed unless discovered incidentally on imaging. When discovered, impacted third molars are usually destined for extraction to avoid future complications or the development of pathological conditions. These complications include resorption or decay of the adjacent tooth and crowding while the potential pathological conditions include pericoronitis and dentigerous cyst formation.(6-9)

In 1986, Haidar and Shalhoub were the first to attempt to estimate the prevalence of impacted third molars in the Saudi population.(10) Using a sample of 1000 patients from the central region of Saudi Arabia, they estimated the prevalence at the time to

be 32.3%.(10) Then in 2010, Hassan repeated the attempt using a sample of 1039 patients from the western region of Saudi Arabia and calculated the prevalence to be 40.6%.(11) Recently in 2012, Syed *et al.* published another prevalence report using a sample of 3800 patients from the Asir region of Saudi Arabia and estimated the prevalence at 18.76%.(5)

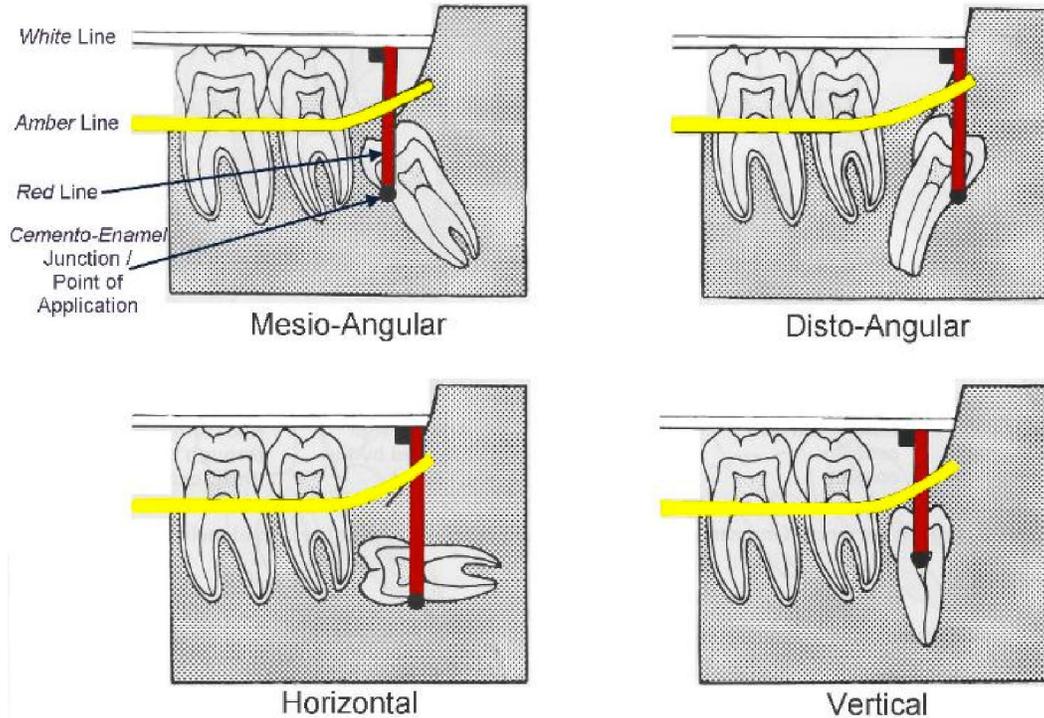
Data about impacted third molar teeth in the Saudi population is dearth. The prevalence is reported only for certain regions of the Kingdom, the most commonly impacted third molar is unknown, and the impaction orientation is undetermined. Therefore, this study was undertaken to document the prevalence of third molar impactions in a sample of the Saudi population. Another objective was to examine the relationship of the impacted third molars to age and gender. The final objective was to evaluate the more commonly affected jaw and the most frequent angulation of third molar impaction.

### 2. Material and methods

Ethical approval was obtained from the Research Ethics Board at the Faculty of Dentistry, King Abdulaziz University. Data collection commenced in October 2013. The data was extracted from the electronic records of patients that came to the dental hospital seeking treatment between September 1<sup>st</sup>, 2011 and April 29<sup>th</sup>, 2013. Inclusion

criteria included: patients 25 years of age or older with a panoramic radiograph with no positioning errors. Exclusion criteria included: trauma patients, patients with systemic conditions or syndromic conditions in which dental impaction are a feature such as cleidocranial dysostosis and Down's syndrome. This resulted in a final sample size of four thousand patients.

The data collected included basic demographics such as age and gender. In addition, the number, type, and angulation of impacted third molars were recorded. The angulation of the impacted third molar was determined using Winter's classification (Figure 1). Note was also made of any pathology associated with the impacted third molar.



**Figure 1: Winter's classification**

Statistical analysis was done using the Statistical Package for the Social Sciences (Version 12.0, SPSS Inc, Chicago, Illinois). The differences between the groups were tested using the Chi-square test, Mann-Whitney test and one-way analysis of variance (ANOVA). The level of significance was set at 5% ( $p < 0.05$ ).

### 3. Results

The prevalence of impacted third molars was calculated at 19.2% based on the finding that 768 patients out of the total sample size of 4000 demonstrated the presence of at least one impacted third molar. A total of 1351 impacted third molars were recorded for the 768 patients, which meant that the average number of impacted third molars per individual was 1.76. Mandibular third molars (426, 55.5%) were more frequently impacted than maxillary third molars (342, 44.5%) and this was a

statistically significant difference ( $p < 0.001$ ). No statistically significant difference was found between the right and left side of both jaws with regards to third molar impactions ( $p > 0.05$ ).

The age range was between 25 to 44 years. Gender distribution was almost equal with 396 females (51.6%) and 372 males (48.4%). There was no gender-specific difference in the prevalence of impacted third molars.

As for the angulation of the impacted mandibular third molars, the most common angulation was mesioangular. Horizontal and vertical angulations were less common but the least common angulation was distoangular. The same did not apply to impacted maxillary molars, as most were vertical in orientation followed by mesioangular, distoangular then horizontal. These results are summarized in Table 1.

**Table 1: Frequency of impacted maxillary and mandibular third molar teeth according to Winter's classification.**

Angulation	Maxillary (%)	Mandibular (%)
Mesioangular	84 (24.5)	178 (41.8)
Distoangular	80 (23.4)	7 (1.6)
Horizontal	11 (3.2)	139 (32.6)
Vertical	167 (48.9)	102 (23.9)
Total	342	426

Pathologies that were noted in association with impacted teeth are summarized in Table 2 and included: caries of the impacted tooth, caries of the adjacent teeth, abscess formation, periodontal

pocketing formation, root resorption of the adjacent teeth, Follicular hyperplasia/ dentigerous cyst formation, and crowding.

**Table 2: List and frequency of pathologies noted in association with impacted third molars**

Pathology	Maxillary	Mandibular
Caries of impacted tooth	none	213
Caries of adjacent tooth	none	320
Abscess formation	none	417
Periodontal pocketing formation	530	603
Root resorption of adjacent tooth	none	1
Follicular hyperplasia/dentigerous cyst	none	4

#### 4. Discussion

The prevalence of impacted third molars in a sample of patients attending a tertiary care facility in Jeddah, Saudi Arabia is 19.2%. The reported prevalence for impacted third molars varies considerably in the literature and ranges from 16.7% to 72%.(5, 9, 11-14) This variability in the reported prevalence may be due to variability in the population characteristics or study design such as sample size or age range of subjects. The patient population attending the dental hospital at King Abdulaziz University is a very diverse population that comprises patients from different ethnic and racial backgrounds. In addition and in spite of the impressive large sample size in this study, the minimum age for inclusion was set at 25 years, which is a relatively older age for assessment of impacted third molars considering that the prevalence of such teeth decreases with age.(5) All these factors may have contributed to the lower prevalence reported in this study.

Mandibular third molars were more commonly impacted than maxillary ones and this difference was statistically significant ( $p < 0.001$ ). This finding is confirmed in other studies including the ones by Syed et al and Hassan *et al.*(5, 11) There was no gender difference in the frequency of impacted third molar teeth ( $p < 0.05$ ). This finding is consistent with most other studies.(11, 15) A gender ratio of 5 males: 1 female was noted in the Syed et al study but this difference was not statistically significant.(5)

Most impacted mandibular third molars were mesioangular in orientation. Horizontal and vertical angulations were less common but the least common angulation for mandibular third molars was distoangular. The same did not apply to impacted maxillary molars, as most were vertical in orientation, followed by mesioangular, distoangular then horizontally angulated third molars. These findings are in exact agreement with the Hassan et al and Syed *et al.* studies.(5) A plausible explanation for this propensity is not clear yet and further research in this area is recommended.

Early recognition of third molar impaction is very important from a therapeutic point of view. Impacted teeth including third molar teeth result in many complications and their early detection and surgical removal is imperative. Abscess formation and periodontal pocket formation were among the more commonly encountered complications of impacted third molars. Another potential complication that was noted in this study was follicular hyperplasia (three cases) and dentigerous cyst formation (one case) around the crown of the impacted third molar. These changes are important to note because they can potentially complicate the surgical removal of the impacted third molar. Root resorption was recorded for only one case in this series.

In conclusion, the prevalence of impacted third molar teeth in a population of patients from Jeddah Saudi Arabia is 19.2%. Mandibular third molars are more commonly impacted than maxillary ones.

Impacted mandibular third molars are most often mesionagular while maxillary ones are vertical in orientation. The frequency of third molar impaction is independent of gender bias.

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