

Original Research

Study of pattern and prevalence of mandibular impacted third molar

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ABSTRACT:

Abstract

Background: Third molars are the most commonly impacted teeth, and their extraction is the most commonly performed procedure in oral and maxillofacial surgery. The aim of the present study is to describe the pattern of mandibular third molar impaction and to define the most appropriate age for prophylactic extraction of mandibular third molar teeth. **Materials & method:** Examination of 1000 cases of patients aged between 20 and 50 years. The study, conducted with the consent of the patients, involved the evaluation of clinical and radiographic records. The parameters investigated included age group, gender, the impacted third molar's location (left/right), angulations, position, and level within the jaw. All the results were recorded in Microsoft excel and was subjected to statistical analysis using SPSS software. **Results:** Among 1000 patients, a total of 350 patients having third molar impactions were evaluated. The age ranged from 20 to 50 years, with a mean age of 27.8 years. Among the 350 patients, there were 161 (46%) male patients and 189 (54%) female patients. **Conclusion:** This study observed a higher frequency of mesioangular and vertical impactions in lower third molars among individuals over the age of 20. Additionally, there was noted an augmentation in the retromolar space in this age group. Consequently, the study suggests that if prophylactic extraction is being considered, delaying the extraction of mandibular third molars until after the age of 20 is recommended.

Key words: Impacted, molar, occlusal

Received: 5 November, 2023

Accepted: 15 November, 2023

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This article may be cited as: Kumar R. Study of pattern and prevalence of mandibular impacted third molar. Int J Res Health Allied Sci 2023; 9(3):39- 42

INTRODUCTION

Tooth is considered impacted when its eruption into normal functional occlusion has been interfered with teeth, overlying bone, or soft tissue and it is not fully erupted by its expected age of approximately 20 years.¹ The third molar is the commonly impacted tooth with a frequency of 18% – 32%.² In third molar impaction, panoramic radiographs are used generally to assess the angular position, level of impaction, amount of covering bone, and relationship between inferior alveolar canal with the third molar. Factors such as the nature of the diet that may lead to attrition, reduced mesiodistal crown diameter, degree of use of the masticatory apparatus and genetic inheritance also affect the timing of third molar eruption. Most of the researchers suggest that the females have a higher incidence of mandibular third molar impaction when compared to males.^{3,4}

Materials & methods

A retrospective study was conducted involving the examination of 1000 cases of patients aged between 20 and 50 years. The study, conducted with the consent of the patients, involved the evaluation of clinical and radiographic records. The parameters investigated included age group, gender, the impacted third molar's location (left/right), angulations, position, and level within the jaw. Patients below the age of 20, those with incomplete clinical or radiological records, individuals with incomplete root formation of the third molar, those experiencing severe systemic diseases, and individuals with craniofacial anomalies or syndromes such as achondroplasia and Down's syndrome were excluded from the study. Additionally, individuals with a history of previous trauma or pathology were also excluded based on the predetermined criteria. The analysis focused on evaluating the angulations, position, and depth of impaction of teeth. Specifically, only those teeth that had not achieved functional occlusion were considered as impacted. Angulations were assessed using the Winter's

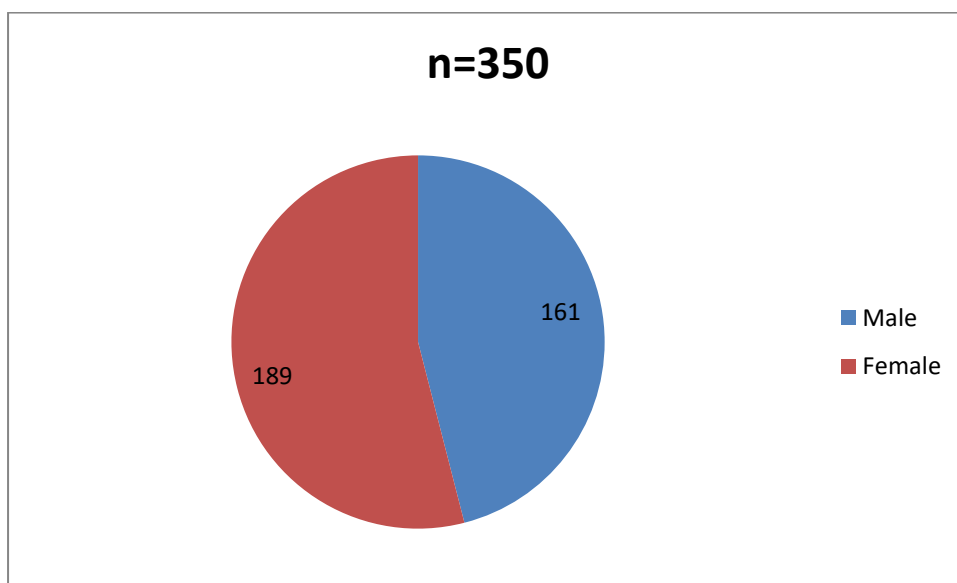
classification, while the position and level of impacted teeth were evaluated using the Pell and Gregory classification.

Results

Among 1000 patients, a total of 350 patients having third molar impactions were evaluated. The age ranged from 20 to 50 years, with a mean age of 27.8 years. Among the 350 patients, there were 161 (46%) male patients and 189 (54%) female patients.

Table 1: Basic data for age and years

	Male	Female	TOTAL
N	161	189	350
Mean	28.5	26.5	27.8



The patients were categorized into six-year age groups, spanning from 20 to 50 years. Within these groups, the prevalence of tooth impaction was highest in the 25-30 years age group. However, this prevalence patients into six distinct groups, each covering a five-year period within the overall age range of 20 to 50 years.

Table 2: Number of patients at different age groups

age (years)	male	female	Total (%)
20-25	26	31	57(16.28%)
25-30	66	56	122(34.85%)
30-35	22	36	58(16.57%)
35-40	25	23	48(13.71%)
40-45	15	12	27(7.71%)
45-50	7	31	38(10.85%)

Angle of impaction

The assessment of mandibular third molar angulation utilized panoramic radiographs with specialized software. An imaginary line, extending from the midpoint of the occlusal surface to the bifurcation of the mandibular second molar and the third molar, represented the long axis of the teeth. The angle formed by the intersection of these long axes determined whether the mandibular third molar had a mesial or distal inclination in relation to the second molar

The classification of impaction followed Quek et al. and was adapted from Winter's classification with the following ranges:

- Mesioangular: 110-79o
- Distoangular: 110-79o
- Horizontal: 80o-100o
- Vertical: 10o-10o

- Others: 111o–80o

Uncommon angulations such as mesioinverted, distoinverted, and distohorizontal were grouped under "Others." Cases where the second molar was absent, leading to an inability to record the angle of impaction, were excluded from the study.

Level of impaction

The evaluation of the mandibular third molar's level of impaction involved assessing its position in relation to the bone, specifically considering the level of the cemento-enamel junction (CEJ). This assessment utilized the Pell and Gregory classification. According to this-

- Level A: Third molar not covered by the bone and its highest part was on the same level or above the occlusal plane of the adjacent second molar.
- Level B: Third molar partially covered by the bone and its highest part was below the occlusal plane, but above the cervical line of the second molar.
- Level C: Third molar completely covered by the bone and its highest part was beneath the cervical line of the second molar

The relationship of the impacted third molar with the ramus of the mandible and the second molar is classified as follows:

- Class I: Space available between the anterior border of the ascending ramus and distal side of second molar is sufficient to accommodate the third molar
- Class II: Space available between the anterior border of the ramus and the distal side of the second molar is less than the width of the crown of the third molar, that is, portion of the third molar crown lies inside the ascending ramus.
- Class III: There is absolute lack of space and the third molar lies completely in the ascending ramus.

Discussion

An impacted tooth is a tooth that, for some reason, has been blocked from breaking through the gum. Sometimes a tooth may be only partially impacted, meaning it has started to break through. The normal age of occurrence of third molars is 18–25 years. A tooth that may appear impacted at the age of 18 years may have as much chance as 25 to 60% of erupting fully, except horizontally impacted molars. Mesioangular impaction emerged as the most prevalent type, accounting for 64.1%, whereas horizontal impaction was the least frequent at 14.9%. Similar findings were noted in other countries, where mesioangular impaction dominated. 10. In our study population, vertical impaction constituted 18.8% of cases.^{5,6}

The selected group of age (20 years to 50 years) that were included by the study covers the age range that most likely to show significant lower third molar movement. More than one-third of third molars get impacted due to insufficient space. Third molar teeth are the last to erupt and have a relatively high chance of becoming impacted. Lack of space, retardation of facial growth, distal direction of eruption, early physical maturity, late third molar mineralization or lack of sufficient eruption force follicular collision, obstruction by physical/mechanical barriers, such as scar tissue, fibromatosis, compact bone, unattached mucosa, odontogenic cyst, and tumors are the common reasons. Higher rates of impaction in the lower jaw can also be attributed to the imbalance of the bone deposition-resorption process at the mandibular ramus, resulting in either a decrease in the angulation of the mandible or increase in the angulation of the mandibular plane.^{7,8}

Pathologies associated with impacted third molar are pericoronitis, caries, food lodgment, pocket formation, periodontal bone loss, root resorption of adjacent teeth, and development of cysts and tumors. It was found that the incidence of mandibular third molar impaction was significantly higher in males in comparison to females. Studies examining the distribution of angulation in impacted third molars consistently indicate that mesioangular impaction is the most prevalent, followed by vertical, horizontal, and distoangular impactions in descending order of frequency.

Conclusion

From this study, the following conclusions can be drawn: Third molar impactions have a mandibular predominance. Males have increased predilection of third molar impaction than females and were equally common on both sides. Mesioangular impaction occurs more commonly followed by vertical impaction. The most common pattern of impaction was Level A and Class II.

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