



Profile of Impacted Mandibular Third Molar at Tertiary Care Hospital: An Institution Based Retrospective Study

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Abstract

Introduction: Impaction of the mandibular third molar represents one of the common developmental anomaly affecting jaws. This may cause Temporomandibular joint dysfunction, resorption of an adjacent tooth root, facial pain, Cysts and tumors etc. Assessment of type of impaction can facilitate the better treatment plan and proper method of surgical intervention to prevent the associated complications.

Aim: To study the pattern of impacted mandibular third molar among the patients reported to tertiary care hospital.

Methodology: A retrospective study was conducted on 235 patients aged 20 to 40 years who reported to the department of dentistry ESIC Medical College and Hospital, Chennai, for the removal of impacted mandibular third molars. Clinical and radiological records were evaluated, and collected included demographic details, angulation, level and space availability.

Results: The average age of the patients was 25years, females were found to be more affected (51.5%). The most common occurring mandibular impaction is Horizontal (45.1%) Class II was seen in (77.9%) Level B (67.7%).

Conclusion: There is insufficient literature on the pattern of impacted mandibular third molars in the Tamil population. Hence, this study was conducted to investigate the pattern of third molar impaction among individuals visiting a tertiary care hospital, with the aim of preventing the numerous complications associated with it.

Keywords: Impaction; Mandible; Third molar; Pattern

Introduction

Tooth impaction is a common problem which occurs in significant number of patients. Tooth impaction is defined as pathological condition in which one or more fully developed teeth fail to erupt or reach normal functional position in the dental arch within the known physiologic time [1]. The third molar impactions are prevalent developmental condition in this modern civilization with a frequency of occurrence generally reported to be from 18% to 32%. [2]. Alhajj et al. [3] said that prevalence of impacted teeth varies substantially between different population ranging from as low as 18% to high as 70%. Several local and systemic causes can lead to impaction of third molars. The associated complications with impaction may be crowding, pericoronitis, resorption of an adjacent tooth root, facial pain, TMJ dysfunction, cyst and tumors. Serious complications sometimes occur like cyst wall transformation into squamous cell carcinoma [4]. Racial differences affect the pattern of impaction. The nature of diet and degree of using masticatory apparatus also affect jaw and tooth size and prevalence of impacted third molars on different populations [2]. Dental health providers should have

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a prior estimation of tooth impaction in the society they are working in order to convey their health mission regarding patient's education and proper treatment [3]. The assessment of type of impaction can facilitate the better treatment plan and proper method of surgical intervention to prevent the associated complications. Hence availability of such statistics is vital and essential. Therefore, this study sought to explore the pattern of impacted mandibular third molars among population at tertiary care hospital.

Materials and Methods

A retrospective study of patients carried out from December 2023 to January 2025 in the department of dentistry ESIC Medical College & Hospital, Chennai to assess the pattern of impacted mandibular third molars. A total of 235 Cases of patients visited department of dentistry for the removal impacted tooth were selected for the study.

The clinical and radiographic records of these patients were evaluated after the consent of patients and approval of the ethical research committee of ESIC Medical College & Hospital, Chennai. The tooth which had not attained functional occlusion were taken as impacted tooth. All the clinical and radiological records reviewed by a single examiner with the help of well illuminated X-ray viewer.

The parameters considered for the study were Gender, age, Angulation of mandibular impacted 3rd molar tooth based on Winter's classification (Figure 1).

The relation of impacted 3rd molar with ramus depending on Pell and Gregory classification and the depth of impacted 3rd molar tooth depending on Pell and Gregory classification (Table 1).

The inclusion criteria for the study were

Table 1: Pell and Gregory classification for assessing position and level of impacted tooth.

Class I	Space between ramus and distal surface of second molar greater than mesiodistal diameter of crown of impacted third molar
Class II	Space between ramus and distal surface of second molar less than mesiodistal diameter of crown of impacted third molar
Class III	All or most of the third molar is located within the ramus
Level A	Occlusal plane of impacted third molar at or above the level of occlusal plane the second molar
Level B	Occlusal plane of impacted third molar below the level of occlusal plane of the second molar but above the cervical line of second molar
Level C	Occlusal plane of impacted third molar below the cervical line of second molar

- The patient's age 20-40 years undergoing extraction of impacted mandibular third molar
- Presence of second molar adjacent to the impacted third molar
- Complete root formation of mandibular third molar

The exclusion criteria for the study were

- Absence of second molar adjacent to impacted mandibular third molar
- Presence of pathological lesions and trauma in the molar area
- Age under 18 years and over 40 years
- Patients with medically compromised conditions as their oral health conditions vary

The analysis of the collected data was performed using the Chi-square test with the help of Statistical Package for Social Sciences version 21.0 (IBM Corp. Armonk, NY, USA).

Results

A total of 235 cases reviewed. The average age of the patients was 25years, females were found to be more affected by impaction with 51.5% cases compared with males who turned out to be involved 48.5% of the cases (Table 2).

Table 2: Demographics.

Demographics		
Gender	Females	121(51.5)
	Males	114(48.5)
Age	Mean age	25.05±5.19

Horizontal impaction was seen in 45.1% of the patients and was most common type of angulation followed by Mesioangular, Vertical and Distoangular impaction with 35.3%, 11.9% and 7.9% respectively (Table 3).

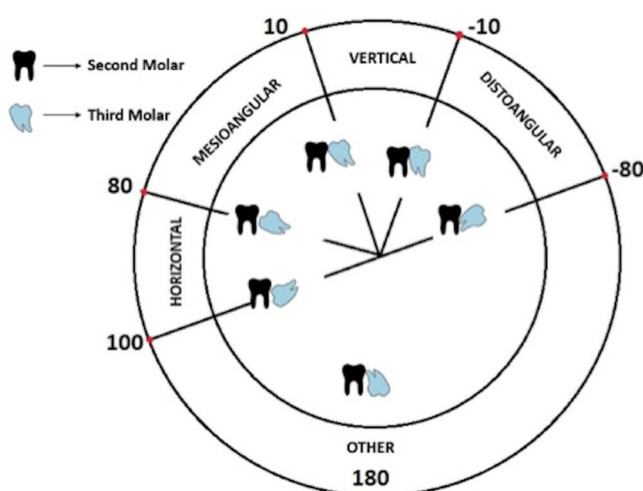


Figure 1: Parameters showing for the study were Gender, age, angulation of mandibular impacted 3rd molar tooth based on Winter's classification.

Table 3: Distribution of various patterns.

Angular pattern	Frequency	Percent
Disto angular	18	7.7
Horizontal	106	45.1
Mesio angular	83	35.3
Vertical	28	11.9

Class II impaction was seen in 77.9% of the patients and was the most common followed by Class I 14.5% and Class III 7.7% (Table 4).

Table 4: Distribution according to the space availability.

Level	Frequency	Percent
I	34	14.5
II	183	77.9
III	18	7.7

Level B impaction was seen in 67.7% of the patients and was most common level of impaction followed by Level A and Level C with 21.7% and 10.6% respectively (Table 5).

Table 5: Distribution according to level.

Level	Frequency	Percent
A	51	21.7
B	159	67.7
C	25	10.6

When gender of the patients was associated the type of impaction 41.3% of females and 49.1% of males were seen to have horizontal impaction. 36.4% of mesioangular impaction seen in females compared to males with 34.2%. which was found to be statistically no significant($p=0.585$) (Table 6).

Table 6: Gender wise comparison of angular pattern.

Gender	Disto angular		Horizontal		Mesio angular		Vertical		pvalue
	N	%	N	%	N	%	N	%	
Female	10	0.083	50	0.413	44	0.364	17	0.14	0.585 (NS)
Male	8	0.07	56	0.491	39	0.342	11	0.096	

Chisquare test $p<0.05$ * significant NS: not significant

As per space availability between 3rd molar and ramus Class II impaction was 79.8% in males compared to females with 76% and Class I impaction was 13.2% in males compared to 15.7% in females and found to be statistically non-significant ($p=0.783$) (Table 7).

Level II impaction found 72.7% in females and 62.3% in males whereas Level I impaction 19.8% in females and 23.7% in males and found to be statistically non-significant ($p=0.153$) (Table 8).

Table 7: Gender wise comparison of space availability.

Gender	I		II		III		pvalue
	N	%	N	%	N	%	
Female	19	0.157	92	0.76	10	0.083	0.783(NS)
Male	15	0.132	91	0.798	8	0.07	

Chisquare test $p<0.05$ * significant NS: not significant

Table 8: Gender wise comparison of level.

Gender	A		B		C		pvalue
	N	%	N	%	N	%	
Female	24	0.198	88	0.727	9	0.074	0.153(NS)
Male	27	0.237	71	0.623	16	0.14	

Chisquare test $p<0.05$ * significant NS: not significant

Discussion

Mandibular third molar impaction is the most common dental problem. The etiology of third molar impactions has been reviewed by various authors over the years. Raj Kumar et al. [5] said lack of space, follicular collision, obstruction by physical and mechanical barriers, such as scar tissue, fibromatosis, compact bone, unattached mucosa, odontogenic cyst, and tumors are the common reasons. Svendsen and Maertens [6] attributed lack of space and late third molar mineralization with early physical maturation as two of the causes of third molar impactions. The jaw space for accommodation of teeth is related to the jaw size, which is determined mainly by genetics. If physical maturity sets in before the mineralization of the third molar, then will be less chance of influencing the remodeling process of overlying bone [5,6]. The change in human lifestyles has contributed to the development of smaller jaws, leaving no or not adequate space for third molar's, the last teeth erupt into the arch [7,8]. Many Studies have reported the prevalence of impaction of the third molar across different countries and it ranges from 16.7% to 68.6%. This variability may be attributed genetic and racial differences [3]. He further said these may be due to consanguineous marriage, racial genetic characteristics, and epigenetic factors (environmental) such as food habits. Most of the studies have found that women are more affected by impacted third molars than men. Ahmed et al. [7] have reported a significant sexual difference in his study with 68.77% in women and 31.22% in men. Hellmen [9] stated that the jaws of the female cease to grow when the third molar begins to erupt, while the of males continue to grow beyond the third molar and thus, third molar impaction is more common in women than men. However, some studies found impacted third molars more in men than women. Moutomaa et al. [10] who studied impaction of third molars in the Finnish University population and reported a prevalence rate of 29% in females and 35% in males. Among these inconsistent sexual predilections in third molar impaction, our study discovered 51.5% in females and 48.5% in males.

Kalaiselvi et al. [2] selected 20-40 years in her study as the growth essentially completed by age of 17 years and possible to evaluate the eruptive status of third molar. The upper limit of 40 years was planned to avoid bias in relation to hard and soft-tissue remodeling. In most of the studies, the majority of the patients were in third decade of their lives [7].

In our study Horizontal impaction was seen in 45.1% of the patients and was most common type of angulation followed by Mesioangular (35.3%) impaction. Our study is in line with other studies like Alhajj [3]. However, Previous studies showed some inconsistency. Quek et al. [11], Kramer and Williams [12], found mesioangular impaction is most common. Studies done by Hugoson and Kugelberg [14], Yamlik et al. [15] found vertical impaction is to be more common than mesioangular. It is to be kept in mind that such comparisons of angulations are difficult to make considering the classification systems that have been used in various studies and also methods used to assess them [5]. In our study Class II, Level B impaction was most common impaction as per Pell and Gregory classification with 77.9% and 67.7% respectively. Quek et al. [12], Hugoson and Kugelberg [13]. Blondeau et al. [14] from Canada and Almendros-Marques et al. [15] from Spain reported Class IIB as the most common position of mandibular third molar. Consequently, the findings of the present study are in agreement with a large number of reports that show most impacted third molars were at Class II position. Ahmed et al. [7] explained that there is no universal consensus on the prevalence or pattern of the third molar impactions. The variations might be attributable to insufficient international standardization of assessment criteria and the difference in assessment tools.

The eruption of third molar is usually predicted with the space available between the second molar and the ascending ramus of the mandible. According to Ganss et al. [16] the probability of eruption is 70% when the mesiodistal space is equal or greater than the mesiodistal width of crown. However, Sandhu and Kaur [17] said that the availability of sufficient space in the jaw cannot guarantee eruption. The establishment of space as for the third molar is regulated by several factors, such as forward movement of the dentition, bone resorption from the anterior border of the ramus, sagittal direction of mandibular growth, backward slope of the anterior border of ramus relative to alveolar border, and growth in length of the mandible [18].

Conclusion

In our study females have more predilection, Horizontal impaction is more frequently found. The most common pattern of impaction was Level B and Class II. This is the first ever study conducted in our hospital to evaluate the pattern of impacted mandibular third molars. In this study we have taken account of the patients who underwent surgical removal

of impacted mandibular third molar at our institution. This study provides only preliminary data. Further large sized studies are required to substantiate its usefulness.

Conflicts of interest: No conflict of interest.

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