



Frequency of Different Types of Mandibular Third Molar Impactions

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ABSTRACT

Objective: Impacted third molars are a major problem in modern dentistry and the decision of whether to remove an impacted third molar is probably one of the most frequent treatment decisions faced by dentists. Impacted mandibular third molars are often associated with pericoronitis, periodontitis, cystic lesions, neoplasm, and pathological root resorption and can cause detrimental effects on the adjacent tooth. Therefore, the objective of the present study was to determine the frequency of different types of mandibular third molar impactions. **Materials and Methods:** This cross-sectional study was carried out in the outdoor patient Department of Oral and Maxillofacial Surgery, Multan Medical and Dental College, Multan during a period of 6 months from 15 December 2017 to 14 June 2018. After written informed consent, a total of 200 patients were recruited, diagnosed clinically and radiographically as having impacted mandibular 3rd molar. Angulation of impacted third molar was classified according to the long axis of the adjacent second molar on periapical and OPG radiographs. Statistical analysis was done through SPSS version 20. **Results:** Out of 200 patients, the frequency of mesioangular, vertical, distoangular, and horizontal impactions were 84 (42%), 60 (30%), 40 (20%), and 16 (8%) respectively. The depths of the impactions were 67 (33.5%) depth A, 92 (46%) depth B, and 41 (20.5%) depth C. **Conclusion:** Mesioangular impaction was more common followed by vertical. Depth B was the most common.

Keywords: Mandibular third molar, Impaction, Orthopantomogram

INTRODUCTION

The impacted third molar is one that fails to erupt into the dental arch within the expected time. It may be due to an adjacent tooth, dense overlying bone or excessive soft tissue [1]. Impacted third molars are a major problem in modern dentistry and the decision of whether to remove an impacted third molar is probably one of the most frequent treatment decisions faced by dentists [2]. Impacted mandibular third molars are often associated with pericoronitis, periodontitis, cystic lesions, neoplasm, and pathological root resorption and can cause detrimental effects on the adjacent tooth. Many clinicians recommended removal of impacted third molars for denture construction [3].

Etiology of permanent teeth impaction includes several systemic and local factors. More commonly, local factors include prolonged deciduous tooth retention, malposed tooth germs, arch-length deficiency, supernumerary teeth, odontogenic tumors abnormal eruption path, and cleft lip and palate [4]. The mandibular angle has been described as a fragile area and the presence of the third molar in this region is supposed to increase the risk of an angle fracture [5]. Multiple studies report 2-fold to 3-fold increased risk for mandibular angle fractures when mandibular third molars are present [6]. One of the theories is that erupting third molars push anterior teeth forward and cause their crowding [7]. Although the third molar with proper positioning normally emerges between the ages of 18 and 24 years, approximately 40% fail to erupt and thus become partially or completely impacted in bone [8].

Depending upon their developmental location, initial angulation, spatial configuration, these teeth are classified according to different classification systems. Aiming to make treatment planning easy, some classification systems have arisen to allow the anticipation of possible disorders and the prediction of some modifications during the operative

act [4]. The classification by Pell and Gregory is widely used for predicting the difficulty of extracting impacted lower third molars. The classification of such molars is based on their spatial relationships (as shown by radiography) to the ascending ramus of the mandible and to the occlusal plane [9]. If space between the anterior border of ramus and the distal surface of the 2nd molar is sufficient for an impacted tooth, it is known as Class I. If space is less than the mesiodistal diameter of the impacted tooth, it is known as Class II. If the tooth is completely into ramus, it is class III.

In Pell and Gregory Class I: The highest part of the impacted tooth can be at or above the level of occlusal plane of the 2nd molar. In Class II: An impacted tooth is between the occlusal plane and the cervical margin of the 2nd molar. In Class III: Impacted tooth lies below the cervical line of the 2nd molar.

Another classification system, winter's classification evaluates the impacted 3M (third molar) long axis in relation to 2nd molar long axis [10]. According to this classification system a tooth can be mesioangular, distoangular, vertical or horizontal. In addition, an impacted tooth can also be angulated buccally, lingually or in a transverse position. Within different types of the impacted mandibular third molar, mesioangular is more common followed by vertical.

Surgical removal is the ultimate treatment of most symptomatic or asymptomatic impacted mandibular 3M. This may be a simple forceps extraction or a more complex surgical procedure involving soft tissue flap reflection, bone removal, tooth sectioning, luxation and elevation of the tooth, debridement of the socket and wound closure. When there is a close relationship between the tooth and the inferior alveolar nerve, damage to the nerve and dysaesthesia may occur [10]. Several factors have been associated with the occurrence of complications which include age, the health of the patient, gender, smoking status, use of contraceptive pills, degree of impaction, surgeon's experience and the surgical technique used [3]. Specific methods depend upon the different types of impaction. Surgical methods vary among surgeons depending upon their training and experience.

The aim of this study is to investigate the different variables according to depth and angulation like mesially, distally, vertically or horizontally positioned impacted or erupted mandibular 3rd molars. By the help of this study, one will come to know the common pattern of third molar impactions as well as their common presentation in our region. This will help in surgical planning of on mandibular third molar and also in decision making of asymptomatic impacted mandibular third molar removal.

MATERIALS AND METHODS

This cross-sectional study was carried out in the outdoor patient Department of Oral and Maxillofacial Surgery, Nishtar Institute of Dentistry Multan during a period of 6 months from 15 December 2017 to 14 June 2018. After written informed consent, a total of 200 patients were recruited, diagnosed clinically and radiographically as having impacted mandibular 3rd molar.

Sample Selection

Inclusion criteria: Cases of mandibular 3rd molar impaction both genders and age (20 to 40 years) presented at the out-patient Department of Oral and Maxillofacial Surgery were diagnosed clinically and radiographically as impacted mandibular molar.

Exclusion criteria: Patient having an extraction of teeth anterior to 3rd molar were excluded from the study because extraction of teeth anterior to 3rd molar allows migration and tilting of impacted teeth, this would lead to change in angulation, state of eruption and space between the distal surface of 2nd molar and anterior border of the ramus.

Data Collection

Patients meeting the inclusion criteria were selected from the out-patient Department of Oral and Maxillofacial Surgery, Multan Medical and Dental College, Multan. On the basis of history, the clinical and radiographical examination was evaluated by the researcher. Orthopantomogram and periapical radiographs were done. the protocol and use of data for the research were explained to the patients to get fully informed and understood consent. A structured proforma was used to record the patient's demographic data like the patient's name, age, and gender. Approval of an ethical committee was sought for maintaining privacy and confidentiality.

Data Analysis

All the data was entered in SPSS version 20 and results were analyzed and presented in the form of frequency,

proportions, and percentages. Qualitative/categorical variables in the demographic data i.e. gender, side of impaction and type of mandibular third molar were presented as percentages and proportions. Whereas quantitative/continuous data i.e. age was presented as mean with standard deviation. Confounding variables like age and gender were controlled by stratification of outcome variables.

RESULTS

Total of 200 consecutive patients presenting for the removal of the impacted mandibular 3rd molar was included in this study. The age range was between 20-40 years. Most of the teeth were partially impacted (70%) and either a part or whole of their crown was exposed in the oral cavity, while 30% of the patients were having fully impacted mandibular 3rd molars.

Analysis of axial inclination of the 3rd molar in relation to the occlusal plane of 2nd molar revealed that the tooth was most commonly impacted in mesioangular position 84 (42%). This was followed by vertical 60 (30%), distoangular 40 (20%), and horizontal 16 (8%).

By analyzing the space between the distal surface of 2nd molar and anterior border of the ramus, it was found that there was sufficient space (Class I) to accommodate the 3rd molar in 86 (43%) of the cases. Space was insufficient (Class II) in 100 (50%) of the cases and the 3rd molar was completely in the ramus (Class III) in 14 (7%) of the cases (Table 1).

Table 1 Classes of impaction

Frequency	%	Valid (%)	
I	86%	43%	43%
II	100%	50%	50%
III	14%	7%	7%
Total	200%	100%	100%

The depths of the impactions were 72 (36%) depth A, 112 (56%) depth B, and 16 (8%) depth C. Out of the 200 patients 140 (70%) were having their 3rd molars bilaterally impacted. Total 116 (58%) of the cases were females and 84 (42%) were males (Figure 1).

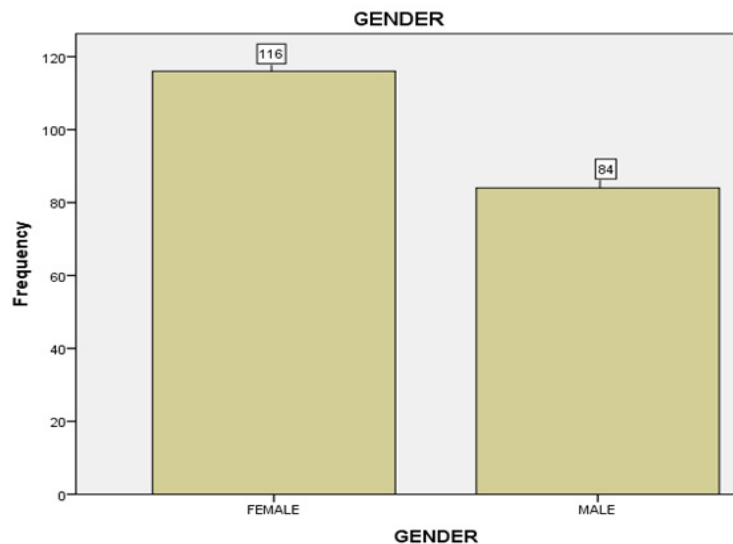


Figure 1 Gender distribution among study subjects

DISCUSSION

The impacted mandibular 3rd molar tooth (wisdom tooth) is very usual among young adults. Previously, it has been expected that 1 out of every 11 mandibular 3rd molar teeth appears in 19-25 years of people. In older adults, 1 in every 46 mandibular 3rd molar teeth was reported to be impacted [11,12]. The mean age of the patients in the Leone and Eden field study was 20 years, while the large sample of Lysell and Rohlin showed a mean age of 27 years. In this

study, the most common age at the time of presentation was 21-25 years [13]. The mean age of patients was 24.75 ± 4.51 years in this study.

Different studies have reported a relationship between mandibular third molar impactions and gender; however, the results have not been consistent [14,15]. A number of studies have shown that impacted mandibular 3rd molars are more common in females than males [14,16].

Whereas Hellman found that impacted mandibular third molars are twice as common in females as compared to males [15]. In contrast, the study of Knutsson, et al., showed that males had more propensity than females to develop mandibular 3rd molar impactions. In our study females formed an overwhelming majority of the patient population with a percentage of 58% accounting for 116 out of the 200 patients, while 84 male patients forming a percentage of 42%.

By analyzing unilateral and bilateral impactions, it was found that bilateral impactions account for 70% of cases. This is due to the fact that most of the impactions occurred due to lack of space in the jaws which is bilateral due to less arch perimeter. Less common causes are the abnormal position of tooth bud, obstruction by a tooth or soft tissue, which can cause unilateral impactions. Kurchid, et al., in their study found that 68% were bilaterally impacted teeth [17,18].

Analysis of the axial inclinations of the teeth revealed that 3rd molars were most commonly in a mesioangular (42%) position, followed by vertical (30%), distoangular (20%) and horizontal (8%). The study of Renton, et al., also showed mesioangular as most common and vertical as the second most common findings. These values are also in correspondence with Chiapasco, et al., a study [19].

The space between the distal surface of 2nd molar and anterior border of the ramus was found that there was sufficient space (Class I) to accommodate the 3rd molar in 43% of the cases. Space was insufficient (Class II) in 50% of the cases and the 3rd molar was completely in the ramus (Class III) in 7% of the cases. The study of Obiechina 122 also showed more common Class II cases. Class I was second and Class III was least common. Gupta, et al., also showed the corresponding results [20].

The depths of the impactions were 36% depth A, 56% depth B, and 8% depth C. Study of Kurchid also showed more common depth B, i.e. between the occlusal and cervical margin, then depth A and depth C, i.e below the cervical line of 2nd molar was least common [17]. Bui in his study had more common depth B [21].

CONCLUSION

From the findings of the present study, it may be concluded that impacted mandibular 3rd molars are more common in females with mesioangular impaction is more common followed by vertical. Also, it is observed that Class II impactions are more common.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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