

FREQUENCY OF COMMON PATTERN OF IMPACTED MANDIBULAR THIRD MOLAR IN PATIENTS PRESENTED TO A TERTIARY CARE HOSPITAL IN PESHAWAR

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ABSTRACT

Objective: To determine frequency of common patterns of impacted mandibular third molar impaction in patients presented to a tertiary care hospital in Peshawar.

Materials and Methods: This descriptive cross-sectional study which is carried out on 195 patients at Oral and Maxillofacial Surgery department, MTI/HMC, Peshawar from 07 June 2018 to 07 December 2018. Detailed history and thorough clinical and radiographic (orthopantomogram) examination with informed consent of all patients were taken. Based on the collected data, the definitive diagnosis of third molar impaction was established.

Results: As per common patterns, 85 (43.58%) patients were recorded with mesioangular impaction, 51 (26.15%) patients were recorded with horizontal impaction, 33 (16.92%) patients were recorded with vertical impaction, whereas only 26 (13.33%) patients were recorded with distoangular impaction.

Conclusion: We concluded that the most prevalent pattern for Impacted Third mandibular is mesioangular position.

Keywords: Mesioangular Impaction; Horizontal Impaction; Vertical Impaction; Distoangular Impaction

INTRODUCTION

Tooth impaction is a pathological condition where a tooth fails to achieve its normal functional position.¹ Third molars impacted teeth are generally found in routine dental practice; however, the rate of impacted third molar has been reported to be higher than those for other teeth.² The reason behind impacted third molar is the insufficient space to the distal surface of mandibular second molar and the anterior border of mandibular ascending ramus.^{2,3}

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Impacted teeth may remain asymptomatic, or otherwise, they have been associated with various pathological conditions including cysts, pericoronitis, caries, tumors, and root resorption. About 73% occurrence of impacted third molar in young adults in Europe has been reported.^{1,2} Generally, the age of third molar eruption is between 17 and 21 years^{1,2} and eruption time variation has been reported with races. For example, in Nigerians mandibular third molar may erupt as early as 14 years of age and in Europeans upto 26 years. The average eruption age of mandibular third molars is approximately 3 to 6 months ahead in males than females. Most authors claim that female have higher incidence of mandibular third molar impaction.⁴

The most frequent pattern of impacted third mandibular molar is mesioangular (44.5 %), followed by horizontal (24.9 %), vertical (17.4 %), and distoangular (12.5 %).⁵ Mandibular third molar impaction is a common condition related to different difficulty degree of extraction surgery and risk of complication including iatrogenic inferior alveolar nerve injury. The reasons for prophylactic extraction of impacted third mandibular molar include the need to reduce the risk of cyst and tumors, to minimize the risk of mandibular angle region fracture, difficulty of surgical removal with age, non restorable periodontal diseases and caries, and that mandibular third molars may be of less importance for mastication.⁶ 96 % of inferior alveolar nerve (IAN) injuries recover within 4 to 8 weeks after surgery and the recovery rate are influenced slightly by age and not by gender ; Sometimes their maybe permanent injury lasting longer than six months, and with different outcomes ranging from mild hypoesthesia to complete anesthesia and neuropathic responses resulting in chronic pain.⁷

In one of the studies carried on population in Lithuania, 543 (54.3 %) patients orthopantomogram (OPG) radiograph showed one impacted third molar at least. 1,128 was the total number of impacted molars. Two (41 %) was most common number of impacted third molar. Mesioangular (35 %) was the most common angulation of impacted third mandibular molar.⁸

The aim of this study is to determine the frequency of common pattern of impacted mandibular third molar in patients presented to a tertiary care hospital in Peshawar.

MATERIALS AND METHODS

A total of 195 patients were registered and included in this descriptive cross section study which is carried out at Oral Maxillofacial surgery MTI/HMC, Peshawar, during Jun. 2018 – Dec. 2018.

All the procedures involving human subjects were adherent to the Helsinki Declaration of 1975 as revised in 1997 (9, 10) and approved from the Research and Ethics Committee of the Hayatabad Medical Complex, Peshawar. All patients were included in the study after taking their informed-consents. For comparison, healthy controls were included based on the normal functional position of the third molar.

All patients were subjected to detailed clinical

history and thorough clinical examination. Digital orthopantomogram (OPG) and periapical radiographs were used to analyze the patterns of mandibular third molars in patients under study. Based on history, clinical examination, and imaging studies, the definitive diagnosis of third molar impaction was established. Common patterns recorded on periapical radiograph and orthopantomogram xray were mesioangular, horizontal, vertical, or distoangular impactions.

Patients were excluded from the study based on (i) mandibular fractures as confirmed from the analysis of orthopantomogram (OPG); (ii) any other previous pathological condition; or (iii) female with a history of pregnancy, because all of these factors act as a confounder and lead to affect the results of the study.

Data obtained was analyzed using SPSS software (version 19; Chicago, IL, USA). All the results were presented in the form of tables and graphs.

RESULTS

After a thorough clinical examination of the third molar position through radiographs, a spectrum of results was obtained. Both male (105 patients; 53.84 %) and female (90 patients; 46.15 %), with mean age 36 ± 18.02 , Eighty two (42.05 %) patients were recorded in the 18 – 30 years age group, 84 (43.07 %) patients in 31 – 45 years age group, and 29 (14.87 %) patients in the 46 – 60 years age group. The male to female ratio was 1.16. As per common patterns, 85 (43.58 %) patients were recorded with mesioangular impaction, 51 (26.15 %) patients with horizontal impaction, 33 (16.92 %) patients with vertical impaction, whereas only 26 (13.33%) patients were recorded with distoangular impaction as represented in Figure 1.

The stratification of common patterns with age showed that mesioangular and horizontal impaction was statistically significant when stratified over the period, as shown in Table 1. Gender wise stratification showed that gender has no significant role over a common pattern of an impacted third mandibular molar as shown in Table 2.

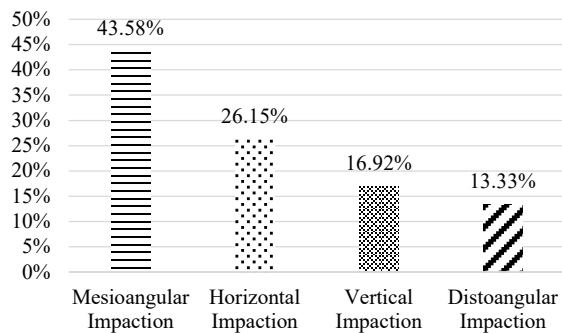


Table 1: Number and percentage of patients recorded with common mandibular third molar patterns including mesioangular, horizontal impaction, vertical or distoangular impaction among the total patients included in the study (n = 195)

DISCUSSION

In 1954, Mead Margaret defined a tooth impaction as a tooth that is prevented from erupting into its normal functional position due to malposition, lack of space and other obstruction.¹¹

Peterson L.J(2003) define tooth impaction as that tooth that fail to erupt within the eruption time into the dental arch.¹² Farman (2004) reported that impacted teeth are those that prevent from eruption within the path of eruption due to a physical barrier.¹³

According to Elsey Rock (2000), the impaction of third molar occurring in European population is upto 73%. Third molar is generally have been formed to erupt between 17 and 21 years and its eruption time has been reported to vary with races.¹⁴ For example, Mandibular third molar may erupt as late as 26 years in European and as early as 14 years in Nigerians. The average age in males for the eruption of mandibular third molar is approximately 3 to 6 months ahead of females. It eruption continues positional changes after eruption can be related with race, genetic background nature of diet and the intensity of use of the masticatory apparatus .¹⁵

Mandibular third molar impaction is a common condition related to different difficulty degree of extraction surgery and risk of complication including iatrogenic inferior alveolar nerve injury.^{4,14}

Contrary to the study conducted by Elsey the incidence of mandibular third molar impaction is claimed to be higher in females than in males in India, the frequency of mandibular third molar impaction is reported as follows Mesioangular (44.5%),

Horizontal(24.9%), Vertical (17.4%) and distoangular (12.5%)^{5,16} The reason for prophylactic extraction of impacted third mandibular molar include the need to reduce the risk of cyst and tumor, to minimize the risk of mandibular angle region fracture. Difficulty of surgical removal with age, non restorable periodontal disease and carries and that mandibular third molar maybe less important for mastication, 96% of inferior alveolar nerve (IAN) injuries recover within 4-8 weeks after surgery and the recovery rate are influenced slightly by age and not by gender. Sometimes there maybe permanent injury lasting longer than six months and with different outcomes ranging from mild Hypoesthesia to complete anesthesia and neuropathic responses resulting in chronic pain.⁷

In one of study on population in Oman, 543(54.34%) patient’s orthopantomogram (OPG) Radiograph showed one impacted third molar at least and 1,128 was the total number of impacted molars. Two (41%) was most common number of impacted third molar, mesioangular (35%) was the most common angulation of impacted third mandibular molar^{8,17}

Third molar are the teeth which erupt last in the jaws of oral cavity and get impacted due to insufficient space availability, any hindrance in path of eruption and malposition of the tooth. Because of the increasing incidence of the impacted third molar and its associated complications it is necessary to analyze retained third molar for diagnosis and better treatment. In this study, the pattern of impacted third mandibular molars in different patients was assessed. The results are in agreement with Richardson’s study.¹⁸

WHO reported that patients with class II malocclusion had third mandibular molar with reduced retro molar space width.¹⁹

Theories have been proposed regarding high incidence of impacted third molar. A popular theory proposed that third molar is last to erupt, there may not be room for it to emerge in the oral cavity.^{20,21}The disbalance in the process of Ramal growth, the mandibular third molar don’t get enough room to emerge²² For mandibular third molar to attain its position in the jaw the favourable path of eruption is necessary. At stage of initial calcification and development if the mandibular third molar bud is angulated medially, the path of eruption will be un-

favorable²³. The increase and decrease in the plane of mandibular angle also cause third molar impaction.²⁴

Yamaoka et al. reported that impaction is related to its root angulation. More angulated roots were found in impacted mandibular third molar than erupted²⁵. Other aetiological factors were also reported including ectopic position of tooth bud, genetic background.²⁶ Lack of sufficient eruption force of the tooth and the phylogenetic theory of jaw size- due to evolution of human there is lack of interproximal attrition resulting in insufficient mesial movement.^{27,28}

The mandibular angle fracture is a common complication of the mandibular third molar extraction, when larger forces are applied on the tooth in relation with their Ramus during elevation process of the tooth without adequate bone removal.²⁹ The other common complication reported in mandibular third molar surgery is lingual nerve injury. Lingual nerve lies close to the thin lingual cortical plate. Buccal cortical plate is thicker because of external oblique ridge which forms the buttress that reinforced the buccal cortical plate. The risk of lingual nerve injury increases when lingual split techniques is used or flap is raised medially to the distoangular recess.³⁰

Rood and Shehab (1990) reported the inferior alveolar nerve injury related to mandibular third molar impaction surgery. Orthopantomogram (OPG) of most of the patient with mandibular third molar impaction showed close relation of the roots to the mandibular canal which contact or penetrate the mandibular canal or they can be deflected.²⁹

Imaging diagnosis for the proper surgical treatment planning is essential for the assessment of anatomical position of mandibular third molar impaction and its relation to the surrounding bone, adjacent roots and mandibular canal. For the assessment of impacted teeth periapical x-rays have been used for long. For the following reasons the long cone paralleling technique for taking periapical radiograph is the preferred technique: minimum radiation, minimum magnification, exact relationship between surrounding bone and neighboring tooth³² The short coming of periapical xray is the use of highly flexible film leading to poor image.³³ These film were replaced with digital imaging system during the last decade.³⁴

Panoramic x-ray can be a technique of choice to view a region that is too large to be seen on Periapical radiograph. Broad coverage of oral hard and soft tissues, low radiation dose and inexpensive are the advantages of panoramic x-ray. High distortion, lower image resolution and phantom image are the major disadvantages. Panorama x-ray depicts a two dimensional view and artificially produce apparent changes.²¹ For example, overlapping of cervical spine on anterior mandible and also it fails to project the relationship between tooth and mandibular canal accurately.^{35,36}

The need for the three dimensional view of accurate projection of relation between the mandibular third molar of an adjacent tooth and inferior alveolar nerve advocated Cone Beam Computed Tomography (CBCT) a method of choice.^{37,38} Ghaemini et al. (2011), in a prospective study, evaluated the role of CBCT in the treatment of patients with high risk of inferior alveolar nerve injury during impacted third molar surgery.³⁷

CBCT was found better in assessment of relation between root and inferior alveolar nerve to lower the risk of injury which result in different surgical approach .³⁸

National institute of health proposed elective extraction of both erupted and unerupted mandibular third molar with signs of follicular enlargement. The tissue removed should be sent to histopathological study. Impacted teeth with chronic Pericoronitis should also be removed electively. Also third molar with extensive carious lesions and those responsible for the resorption of adjacent teeth resorption should also be removed electively.³⁹

Koerner (1944) suggests following indications for the extraction of mandibular third molar, pericoronitis, existing pathology, periapical infection, cyst or tumor, resorption of adjacent tooth, ectopic position, orthodontic treatment, proceeding dental work with fixed or removable appliances.⁴⁰

CONCLUSIONS

Based on the analysis of the data collected in this study, it is concluded that the mesioangular position is the most prevalent pattern for lower third molars. It was also found that gender and age play no significant role in the common pattern of mandibular third molar impaction. More studies with big samples

size from different hospitals are required to draw a clear and final conclusion of the relation of age and gender with third molar impactions.

ACKNOWLEDGMENTS

We are thankful to Hayatabad Medical Complex, Peshawar, and Khyber College of Dentistry, Peshawar, for the technical support.

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