

EPIDEMIOLOGY

PATTERNS AND PRESENTATIONS OF IMPACTED MANDIBULAR THIRD MOLARS SUBJECTED TO REMOVAL AT KHYBER COLLEGE OF DENTISTRY PESHAWAR

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ABSTRACT

Two hundred consecutive patients of mandibular third molar impactions presented to the oral surgery department of Khyber College of dentistry Peshawar were studied clinically and radiographically. Purpose of the study was to determine the patterns and presentations of mandibular third molar impactions. The impacted mandibular third molars were classified according to Pell and Gregory's method of classification as well as according to their angulations. Pathologies related to each type were also documented.

The most common angulation of impacted mandibular third molar was mesioangular (48%) followed by vertical (35%) and distoangular (10%). Pell and Gregory Class II (55%) and Class I (38%) were the most common types of impacted mandibular third molars. By analyzing level of eruption, it was found that Pell and Gregory Class B (59%) and Class A (35%) were the most common types of impactions.

Pericoronitis was the most common pathology (48.5 %) followed by caries (26.5 %) and periodontal problems (10 %).

Lack of awareness and mismanagement of impacted mandibular third molar often lead to recurrent infections and irreversible damage to their adjacent structures. As a result of this study previous recommendation for the prophylactic removal of those impactions, which are at higher risk of developing pathologies is suggested; otherwise a regular clinical and radiographical follow-up is necessary.

Key words: *Impacted tooth. Mandibular third molar. Pathologies. Pericoronitis. Caries. Periodontal Problems. Pell and Gregory classification. Angulations.*

INTRODUCTION

An impacted tooth is one which is prevented from eruption into functional position either entirely or

partially by an obstruction. This obstruction may be with different types of pathologies among which peri-another tooth, bone or soft tissue^{1,2,3}. Mandibular third coronitis is the most common pathology associated molar are the most commonly impacted teeth⁴. Defficient with it'. Caries of the 3rd molar and adjacent 2nd molar space in the dental arch, an aberrant path of eruption is the 2nd most common pathology associated with

and late eruption sequence are the main etiological factors^{5,6}.

An impacted mandibular third molar can present

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impacted mandibular third molar⁸. Pericoronitis and/ or caries/pulpitis, if not treated properly, can lead to serious facial space infections⁹. The impacted mandibular third molars are also the cause of root resorption of the 2nd molar and periodontal problems (deep periodontal pocket between 2nd molar and 3rd molar). Impacted tooth weakens the angle of the mandible and makes it susceptible to fracture easily. It is also responsible for certain tumourous and cystic lesions of the jaw. In addition, the impacted teeth have been implicated in the etiology of lower arch crowding, TMJ disorders, vague orofacial pain and neuralgias⁴.

Depending upon their developmental location, initial angulation and spatial configuration the third molar may acquire variety of patterns and positions in the mandible. Such classification is helpful in communication between colleagues, record keeping and treatment planning.^{10,11}

The first classification system describes the angulation of the long axis of the mandibular third molar with respect to the long axis of the mandibular 2nd molar; hence tooth can be mesioangular, distoangular, vertical or horizontal.

Pell and Gregory, which relates the depth and space of mandibular third molar, describe another classification system¹². In Pell and Gregory system of classification, if the space between the anterior border of the ramus and distal surface of the 2nd molar is sufficient for impacted tooth, it is known as Class I. If this space is less than the mesiodistal diameter of the impacted tooth, it is Class II. If the tooth is completely into the ramus, it is Class III. In Pell and Gregory Class A, the highest part of the tooth can be at or above the occlusal plane of the 2nd molar. In Class B, an impacted tooth is between the occlusal plane and cervical margin of the 2nd molar. In Class C, an impacted tooth lies below the cervical margin of the 2nd molar.

Surgical removal is the ultimate treatment of the most impacted mandibular third molars. 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. Surgical methods vary among surgeons depending upon their training and experience¹².

MATERIALS AND METHODS

Two hundred consecutive patients with impacted mandibular third molars from Jan 2003 to Aug 2006, presented to the Department of Oral Surgery Khyber College of Dentistry Peshawar, were examined clinically and radiographically. A standard history and examination chart was filled, which was developed for this purpose. The chart contained information about the demographic data of the patient, his/ her presenting complaints, health status of oral dental structures and clinical and radiographic features of the impacted mandibular third molars. The periapical view was the standard radiograph because it gives better details about alveolar bone height, caries, and bone and tooth resorption. Sometimes the periapical view was supplemented by OPG, where complete view of the entire third molar area was required.

RESULTS

Two hundred consecutive patients were included in this study. Most of them were younger than the age of 30 years (70%) and only 8% were above 40 years of age (Table-1).

Pericoronitis was more common in younger ages, however other pathologies like periodontal problems, caries, and root resorption of 2nd molar was common in older patients (Table-II).

Most of the teeth were partially impacted (70%) and either a part or whole of the crown was exposed into the oral cavity. Analysis of axial inclination and Pell and Gregory classifications are shown in Table-III.

TABLE I:

Age (Years)	SEX		TOTAL
	Males	Females	
20-25	33	42	75
25-30	17	23	40
30-35	16	13	29
35-40	13	12	25
40-45	12	11	23
45-50	4	3	7
50<	1	0	1
TOTAL	96	104	200

TABLE II: RELATIONSHIP OF AGE WITH PATHOLOGIES

PATHOLOGIES	AGE (YEARS)							TOTAL
	20-25	25-30	30-35	35-40	40-45	45-50	50<	
Pericoronitis	60	18	11	5	3	0	0	97
Caries	5	18	11	8	7	4	0	53
Periodontal Problems	1	1	4	7	6	1	0	20
Facial space Infections	3	2	1	1	2	1	0	10
Root Resorption	0	0	0	2	2	1	0	5
Fractures	0	1	1	1	2	0	0	5
Cysts/Tumors	0	0	1	1	1	0	1	4
Orthodontic Reasons	6	0	0	0	0	0	0	6
Total	75	40	29	25	23	7	1	200

TABLE III: PATTERNS OF MANDIBULAR THIRD MOLAR IMPACTIONS

ANGULATION	SPACE AVAILABILITY			TOTAL	LEVEL OF IMPACTION			TOTAL
	I	II	III		A	B	C	
MESIOANGULAR	50	37	9	96	32	61	3	96
VERTICAL	14	53	3	70	23	45	2	70
DISTOANGULAR	7	13	0	20	14	6	0	20
HORIZONTAL	5	9	0	14	1	6	7	14
TOTAL	76	112	12	200	70	118	12	200

Most of the impacted teeth (97%) subjected to removal were involved with the signs and symptoms of pathosis. Pericoronitis was the most common pathology (48.5%) associated with impacted mandibular third molar. This was followed in descending order by caries (26.5%), periodontal problems (10%), facial space infections (5%), resorption of 2nd molar (2.5%), fracture at the angle of mandible (2.5%) and cysts and tumors (2%). Three percent of the third molars were removed to facilitate orthodontic treatment.

Pathologies were also analyzed in relation to axial inclination of the impacted teeth, space deficiency and depth of impaction (Pell and Gregory classification system) as shown in Table-IV, V, and VI.

TABLE-IV: FREQUENCY OF DIFFERENT PATHOLOGIES IN RELATIONB TO AXIAL INCLINATION

Pathologies	Mesioangular	Vertical	Distoangular	Horizontal	Total
Pericoronitis	34	46	12	5	97
Caries	37	10	5	1	53
Periodontal Problems	13	5	0	2	20
Facial Space Infections	5	4	1	0	10
Root Resorption	3	0	0	2	5
Fractures	1	2	0	2	5
Cysts/Tumors	1	1	1	1	4
Orthodontic Reasons	2	2	1	1	6
Total	96	70	20	14	200

TABLE-V: FREQUENCY OF PATHOLOGIES IN RELATION TO SPACE AVAILABILITY

PATHOLOGIES	CLASS-I	CLASS-II	CLASS-III	TOTAL
Pericoronitis	39	53	5	97
Caries	19	31	3	53
Periodontal Problems	7	12	1	20
Facial Space Infections	4	5	1	10
Root Resorption	1	3	1	5
Fractures	2	3	0	5
Cysts/Tumors	1	2	1	4
Orthodontic Reasons	3	3	0	6
Total	76	112	12	200

TABLE-VI: FREQUENCY OF PATHOLOGIES IN RELATION TO LEVEL OF IMPACTION

PATHOLOGIES	CLASS-A	CLASS-B	CLASS-C	TOTAL
Pericoronitis	36	57	4	97
Caries	20	31	2	53
Periodontal Problems	8	11	1	20
Facial Space Infections	2	7	1	10
Root Resorption	0	4	1	5
Fractures	1	3	1	5
Cysts/Tumors	1	1	2	4
Orthodontic Reasons	2	4	0	6
Total	70	118	12	200

DISCUSSION

Mandibular third molar impaction is a common problem affecting a large proportion of population. Epidemiological studies often fail to distinguish between the prevalence of different impacted teeth. The most common age group at the time of presentation was 20-25 years 37.5% followed by 25-30 years (20%). Thus more than half of the patients were in the third decade of their lives. This sharp decline in number of 3rd molar impactions with increasing age is due to their operative removal. Other studies confirm this finding. Obiecha AE and Arotiba JT²⁰, Pual23ikorn J and Wailkakul A²¹ and Lysell and Rohlin. Contrary to these studies, however, a higher proportion of people (15.5%) were older than 40 years. This difference is, may be, due to the fact that lack of oral health awareness leads to the unnecessary delay of the treatment in our region. Sex difference does not affect the type and incidence of pathologies significantly.

Values of the analysis of axial inclination are in accordance with the values of Peter Tetsch et al²⁴, Chiaspaco et al²², and Ronton et al²³. However small variations are there, which are in the acceptable range. The results of the Pell and Gregory classification are bit different from other studies e.g. Abiechina AE and Arotibe JT²⁰. Other studies have shown that larger percentage of teeth is in Class-III and Class-C as compared to this study. The fact that our population consumes much fibrous diet, promoting jaw growth and circumferential attrition of the teeth, appears to be the main reason behind this difference. Genetic and racial differences are also other important considerations.

Partial hard and soft tissue encapsulation, space deficiency, level of eruption and angulation of most teeth were so that they were at the risk of developing pathologies. Pericoronitis was the most common reason for the surgical removal of mandibular third molar (48.5%). Other studies like Lysel and Rohlin

32%¹⁸, Brickly and Shaphered 39.5%²⁵, Knutson and Brehmer 64%²⁶ have also shown that pericoronitis is the most common pathology associated with impacted third molars. Pericoronitis was more common in vertical and distoangular impactions (67.5% and 60% respectively) and was also common in Class A (57%). Lintonjua LS²⁷ found that pericoronitis is common in vertical angulation 68% and in Pell and Gregory Class A 70%. Other studies also show that vertical and Class A impactions have more potential of developing pericoronitis.

Caries was the 2nd most common pathology associated with impacted mandibular third molars (26.5%). Impacted tooth was involved in 12.2% and adjacent 2nd molar in 14% of the cases. This shows that not only 3rd molar is prone to develop caries but its defective contact with adjacent 2nd molar also leads to the development of caries in the 2nd molar. Brickly and Shepherd²⁵ had found 3.9% Lysel Rohlin¹⁸, Obichina and Arotibe 13.5%. All these studies show lesser percentage of occurrences of caries. This may be due to poor socioeconomic status and lack oral health education of our community, which leads to delayed diagnosis when no treatment can be given to the patient except extraction. It was found that caries were more common in mesioangular and distoangular teeth and the teeth in Pell and Gregory Class A. They were uncommon in fully impacted (Class C) and horizontal impactions. As there are more chances of food impactions in mesioangular and distoangular impactions so these types are more prone to caries. These results are in accordance with other studies 18, 25, 20, and 26

In the 10% of the cases 3rd molars were involved in food packing, deep pocketing, alveolar bone loss distal to 2nd molar and periodontal problems. In other studies Knutsson K and Brehmer²⁶ found 8% and Lysel and Rohlin 3%¹⁸ of these problems associated with impacted mandibular third molars. This smaller percentage is may be due to awareness of oral health education and employment of preventive dentistry in the developed countries. These problems were common in mesioangular, horizontal and in Pell and Gregory Class A and Class I type of impactions. This is due to the fact that these types of impacted teeth leave a deep pocket distal to 2nd molar and food pocketing in this area compromises the integrity of PDL and alveolar bone.

The pericoronal, pulpal or periapical infections of the lower molars origin can spread to the buccal, submandibular, sublingual, ptyregomandibular and other facial spaces. In this study 5% of the patients presented with facial space infections. In all these cases, the patients had either neglected their earlier pericoronal, pulpal or periapical infections or these conditions had been mismanaged. Lintonjua LS²⁷ found 11% of the cases of impacted 3rd molar with deep facial space infections and most of these cases were secondary to pericoronitis.

Five patients (2.5%) were presented with the resorption of the distal surface of 2nd molar. Three patients had mesioangular while two patients had horizontal impactions. Three of the cases had Pell and Gregory Class II and Class B type of impaction. In other studies, Knutsson and Brehmer²⁶ found 1% and Stanly¹³ found 3.5% of these problems with the impacted mandibular 3rd molars. Nemcovsky and Libfeld¹⁴ in their study of the effects of unerupted 3rd molar on supporting structures of proximal teeth found that 22.5% of the cases showed root resorption, while moderate to complete resorption was found in 6% of the cases. Teeth with mesial inclination were significantly associated with root resorption. As it was just a radiographic survey of impacted teeth and their study was based on the effects of impacted teeth on adjacent teeth only, so there is no need to wonder on this large percentage of cases.

Five patients presented with fractures at the angle of mandible. Two impacted third molars involved in fractures were vertical and two were horizontal. Four of the impacted teeth involved in fracture had Class B and three had Class II type of impaction. Other studies confirm that patients with impacted third molars have great risk of angle fracture than those who don't have their third molars.^{15, 16, 17, and 28.}

Two percent (2%) of the patients were presented with cysts/tumors. Among them two patients had dentigerous cyst, one had ameloblastoma and one had keratocyst. These results are in accordance with other studies. Stanly et al" found that incidence of dentigerous cyst is one percent (1%). Lysel and Rohlin 3%¹⁸, Rakprasitkul 3%¹⁹, Guvan 0 and Keskin A²⁸ found 3.1% of these cases related to impacted third molars.

CONCLUSIONS

Mandibular third molars are most commonly impacted in mesioangular, Pell and Gregory Class II (deficient space) and Pell and Gregory Class B (partially erupted). Common pathologies related to impacted mandibular third molars are pericoronitis, caries and periodontal problems. Due to the lack of awareness, neglect and mismanagement of impacted teeth, these teeth can cause recurrent discomfort, irreversible damage to adjacent structures, may lead to life threatening facial space infections and destructive cystic and tumorous lesions.

Those impacted third molars, which are at high risk of developing pathologies, should be removed prophylactically. If these teeth are left in situ then a long term clinical and radiographic follow up is necessary so that prompt intervention can be instituted where pathology starts to develop.

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