

DENTAL CARIES AND PERICORONITIS ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLARS—A CLINICAL AND RADIOGRAPHIC STUDY

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ABSTRACT

The most common impacted tooth is mandibular third molar and knowledge and assessment of its angulation pattern, position and depth in mandibular bone helps in better treatment planning and management of patients. The objective of this study was to enlist the frequency of dental caries and pericoronitis associated with different patterns of impacted mandibular third molars in different age groups and genders.

A total of 250 patients with 393 impacted mandibular third molars seen in the Department of Oral and Maxillofacial Surgery, Punjab Dental Hospital, Lahore from October 2012 to March 2013 were included in the study. The age range of these patients was of 20 to 65 years. Patients were assessed by history, clinical and radiographic examination. Patterns of mandibular third molar impactions were assessed by using classification systems developed by Winter and Pell and Gregory on periapical radiographs. Pericoronitis was assessed by patient's history and clinical evaluation of mucosa surrounding the impacted mandibular third molars. Dental caries was assessed by clinical and radiographic evaluation.

The most frequent pattern of impaction was mesioangular (37.6%), with Class II ramus relationship (53.2%) and Position A depth (62.8%). Dental caries was seen in 38.53% of patients mostly associated with mesioangular, Position A, Class I molars. Pericoronitis was seen in 29.36% of patients mostly associated with distoangular, Position A or B, Class II molars.

It was concluded that the patients having third molars with the unfavourable angulations, patterns and positions could be considered as the candidates for prophylactic removal of impacted mandibular third molars to prevent dental caries or pericoronitis. Moreover, early diagnosis of pericoronitis and dental caries and proper management of third molar is necessary to prevent further consequences.

Key Words: *Impacted third molar, Pericoronitis, Dental caries, Distoangular impaction.*

INTRODUCTION

Impacted teeth are those which fail to erupt in dental arch within expected time.^{1,2} Any tooth in den-

tal arch may become impacted but the most common are mandibular third molars. The tooth may become impacted because of adjacent teeth, dense overlying bone or excessive soft tissue.⁴ Different local causes of impacted teeth include lack of space in the jaw, an aberrant path of eruption, premature loss of primary teeth, abnormal positioning of tooth bud, inflammatory or pathological lesions etc.^{3,4,5}

Mandibular third molars erupt at 17 to 21 years age. Frequency of impaction is three fold in mandible than maxilla, with significantly higher frequency in females than males.^{6,7,8} Mandibular third molars may acquire a range of patterns and positions and can lead to diverse pathologies. Clinical and radiographic

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Received for Publication: May 5, 2014

Revision Received: May 26, 2014

Accepted: May 31, 2014

examinations not only facilitate to classify these teeth but also help to diagnose and differentiate different pathologies associated with them. Pericoronitis is the most common problem associated with impacted third molar followed by dental caries of third molar itself or adjacent second molar (Fig 1a-c).⁹⁻¹¹

Although it is possible to observe the profile of soft tissue in relation to third molars, there are currently no standardized clinical criteria for assessment of soft tissue associated with impacted teeth. These parameters not only pose difficulties in accurate recording of the clinical condition of soft tissue but also open new horizons for future studies.²¹

Pericoronitis is an acute inflammatory condition associated mostly with partially erupted mandibular third molars. Clinical features include pain, swelling, limited jaw opening, difficulty in swallowing, fever, malaise and lymphadenopathy. On the basis of the severity of these features pericoronitis is classified into acute, sub-acute and chronic types.^{12,17} If appropriate treatment is not initiated, pericoronitis may progress to cellulites, osteomyelitis, or facial space infections. Position of third molars in jaw and their occlusal anatomy with deep occlusal fissures favours the accumulation of biofilm on tooth and leads to dental caries. Impacted mandibular third molars that contact cemento-enamel junction of second molar place this tooth at risk of distal cervical caries.¹⁰ In these situations, prophylactic removal of impacted tooth can benefit dental health of patient.^{13,14,15}

The universal recommendation is to consider each case individually to balance the benefits and risks of retention versus extraction of third molar. Furthermore, where non-extraction strategy is adopted, long-term clinical and radiographic follow up should be maintained, so that surgical intervention can be instituted if some pathology starts to develop.¹⁶ Classically called 'wisdom teeth' implying the age at which they erupt when humans are thought to attain wisdom. Their eruption has traditionally been linked with a host of inflammatory problems due to different types of microbial flora e.g. spirochaetes, prevotella, veillonella, bacteroides and capnocytophaga in the gingival crevice of partially impacted third molars.¹⁷

There are a lot of studies about impacted third molars both in national and international literature but a few articles about their association with pericoronitis and dental caries. The present study will elucidate on dental caries and pericoronitis associated with different

patterns of mandibular third molar impaction. This in turn will help to prioritize treatment in patients with such patterns and rationalize decision making in relation to pericoronitis and dental caries of impacted mandibular third molars.

METHODOLOGY

This case series was conducted at Oral & Maxillofacial Surgery Department, de, Montmorency College of Dentistry / Punjab Dental Hospital, Lahore from October 2012 to March 2013.

A total of 250 patients were selected for this study. Inclusion criteria for the study group were patients with chief complaints related to impacted mandibular third molars and/or associated pericoronitis or dental caries and complete root formation of mandibular third molar. Exclusion criteria were the patients younger than 20 years, patients suffering from some other maxillofacial problem or with some systemic disease e.g. diabetes mellitus, any systemic or craniofacial anomaly or syndrome (e.g. Down syndrome, cleidocranial dysostosis) and absence of mandibular second molar. Assessment of different patterns of impacted mandibular third molar teeth and their associated pericoronitis and dental caries was done by detailed relevant history, clinical examination and radiographs.

A history of pain or swelling in third molar region, difficulty in chewing and mastication, foul smell or limitation of mouth opening was recorded. Extra orally, patients were examined for skin colour and texture or any swelling. Mouth opening was observed by measuring median inter-incisal opening. Intra orally, oral hygiene was assessed with status of dentition especially any carious lesion in mandibular third molar or adjacent second molar. The mucosa around mandibular third molar was assessed for any change in colour, texture, food impaction, swelling, bleeding or pus discharge. The peri-apical x-rays were used to assess any carious lesion in second or third molar, angulation of mandibular third molar impaction, its depth and ramus relationship.

Angulation of impacted mandibular third molars was assessed by Winter's classification and teeth were labeled as mesioangular, distoangular, vertical or horizontal and other impactions (buccal, lingual or transverse). Pattern and position of impacted third molar was documented according to Pell and Gregory classification. If space between anterior border of ramus and distal surface of second molar was sufficient, it

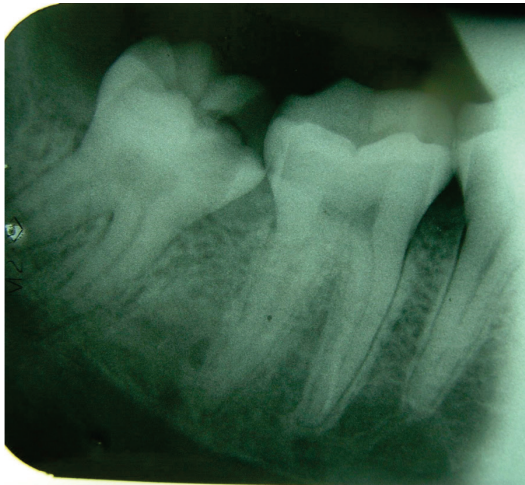


Fig 1a: Dental caries- third molar

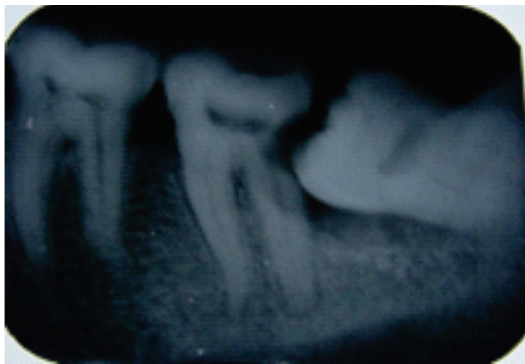


Fig 1b: Dental caries- second molar



Fig 1c: Pericoronitis-Distal gingival of 3rd molar

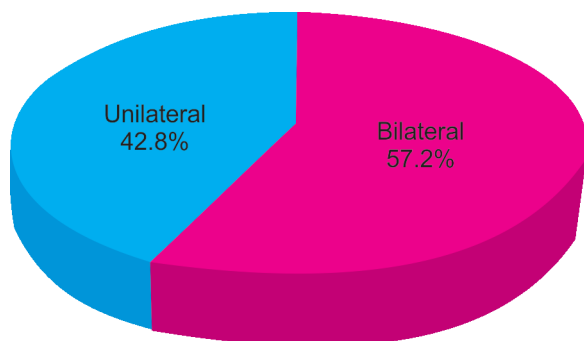


Fig 2: Distribution of uni- and bilateral impactions

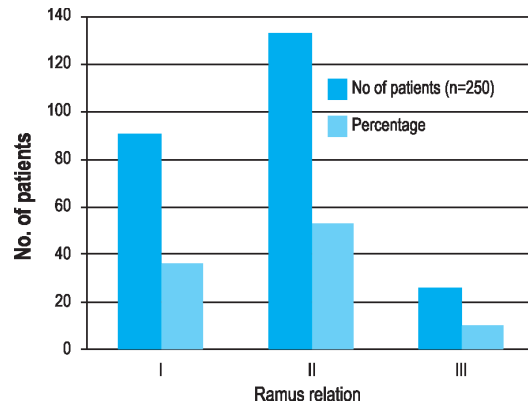


Fig 3: Distribution of patients; ramus relation wise

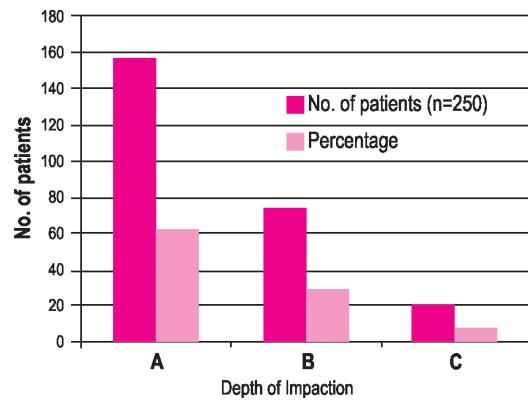


Fig 4: Distribution of patients; depth wise

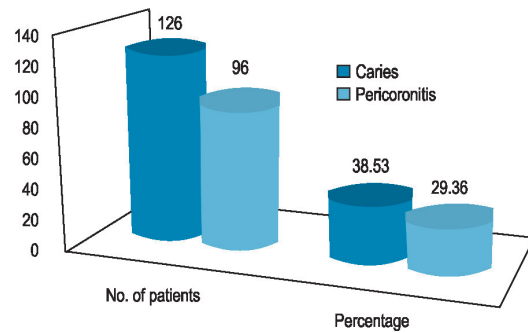


Fig 5: Distribution of Dental Caries and Pericoronitis

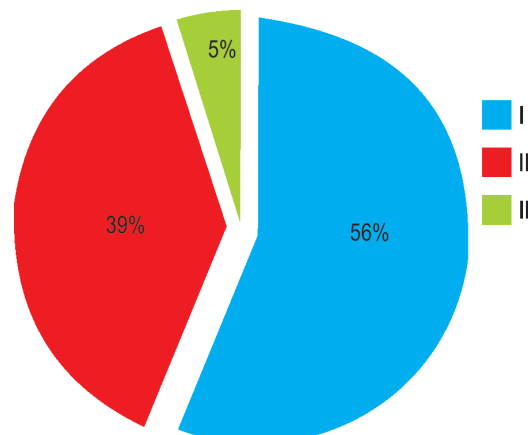


Fig 6: Distribution of Dental Caries; Ramus relation wise

was labeled Class I. If space was less than mesiodistal diameter of impacted tooth, it was termed Class II. A tooth completely into ramus was assigned Class III. A third molar with its highest part at level of occlusal plane of second molar was assigned position A. In position B, impacted tooth was between occlusal plane and cervical margin of second molar while a tooth below cervical margin was labeled position C.

For each patient, a number of variables were recorded including demographic details (age and sex), side (right or left), angulation (mesioangular, distoangular, vertical, horizontal), pattern of impaction (class I, II, III or position A, B, C) and associated pathologies (pericoronitis, dental caries of second or third molar).

The data were recorded in a specially designed proforma and entered in SPSS version 16 and analyzed through its statistical package by using Chi Square test. The data were presented as proportion and percentage. The variables were also presented in tables and graphs.

RESULTS

A total of 250 patients having 393 impacted mandibular third molars were selected for the study. The age range was of 20 to 65 years. The highest number of patients having impacted third molars was of 20-25 years followed by 26-30 years. There was a uniform decline in number of patients with increasing age.

DISCUSSION

The removal of impacted third molars is a frequently performed dento-alveolar procedure worldwide.¹⁸ The present study was conducted on patients over 20 years, because by this age, one can differentiate more reliably if third molar has insufficient space or is improperly positioned or its root formation has completed.²⁶ Though the literature holds a significantly higher frequency of impacted third molars in females, the findings of current study showed a slight male preponderance (54%). These observations are not in favour of Hellman's theory which states that jaws of females stop growing when third molars just begin to erupt, whereas in males growth of jaws continues beyond the time of eruption of third

molars resulting in decreased incidence of third molar impactions in males compared to females.¹⁹ A uniform decline in the number of patients, with increase in age was also noted with a mean age of 31.08 years (SD = +/- 8.98 years). People in their third decade of life were seen with highest percentage of impacted third molars.^{9,24} Mesioangular impactions were the highest number of impacted mandibular third molars, followed by vertical, distoangular and horizontal angulation. There might have been an increased degree of disparity in these findings relating to operator sensitive differences in labeling 'overlapping' angulations e.g. teeth having 70° to 90° inclination to occlusal level. In the current study, this problem was overcome by using a standardized scientifically geometric method to classify and label such impacted teeth. About 53% patients had a ramus relationship of class II, followed by class I and class III. About 62.8% patients had impacted third molar placed at position A depth, followed by position B and C. These findings closely match the national and international studies.²⁰⁻²⁶

A total of 250 patients with 393 impacted mandibular third molars presented for extraction of these teeth. The most frequent reason for extraction of third molar was dental caries in adjacent second molar or third molar itself (38.53%), followed by pericoronitis in 29.36% of patients. These findings are different than those seen in other studies from Pakistan where pericoronitis was 48.5% in Peshawar²⁸ and 53% in Lahore.²⁹

Obiechina and others showed that 42.9% of impacted teeth were associated with pericoronitis and 13.9% with caries. Pericoronitis has widely been reported as the main reason for extraction of lower third molars. Jamileh and Pedlar also found that pericoronitis was the most common indication for removal of impacted mandibular third molars. Researchers have proposed that as pericoronitis forms one of the most frequent acute conditions affecting the oral cavity, its presence with uncomfortable symptoms forms an important and urgent reason to seek care in the form of extraction of impacted third molar. The acute nature of the problem often draws patient's attention to hospital consultation

TABLE.1: DISTRIBUTION OF DENTAL CARIES AND PERICORONITIS; ANGULATION WISE

Pathology	Distoangular	Horizontal	Vertical	Mesioangular	Other	Total
Caries	14	11	38	63	1	127
Pericoronitis	45	4	26	21	—	96
Total	59	15	64	84	1	223

more than other symptoms associated with impacted third molar.²⁷ In the current study, pericoronitis was seen to be the second common and not the most common reason for extraction of third molars. This might be due to the appointment schedule protocol of this department. Moreover, minor oral surgery clinic of de, Montmorency College of Dentistry/Punjab Dental Hospital Lahore is the biggest treatment centre of surgical dento-alveolar problems in the province of Punjab, a very high number of patients with impacted third molars are referred from different primary care centers or private clinics. As pericoronitis necessitates early consultation by a doctor making it an urgent need to see a doctor and is therefore, seen more at private clinics. The acute problem may resolve up till the patient visited the tertiary care centre for extraction of impacted molar. Pericoronitis was more often seen in patients with positions A and B, because these depths are generally associated more with soft tissue impaction forming a cuff over partially erupted teeth and start pericoronitis. No infected patients showed complete impaction or position C. Similarly, pericoronitis manifested most commonly in class II impacted molars which is probably because they are half visible in the mouth with an operculum and do not have a good inter-cuspation with maxillary counterparts. Erupted maxillary third molars may further aggravate infective process in the operculum by constantly traumatizing soft tissue. Partial or submucosal impaction is a significant risk factor for acute pericoronitis in impacted mandibular third molars.^{30,31}

CONCLUSION

The impaction of mandibular third molars was most commonly seen in patients in their third decade of life. The most common pattern of mandibular third molar impactions was mesioangular, with a position A depth and Class II ramus relationship. Dental caries was mostly associated with mesioangular, Position A, Class I molars. Pericoronitis was associated more commonly with distoangular, position A or B, Class II molars in patients from 20-35 years of age. Therefore, the patients having third molars with these unfavourable angulations, patterns and positions could be considered the candidates for prophylactic removal of impacted mandibular third molars. Moreover, early diagnosis of pericoronitis and dental caries and proper management of third molar is necessary to prevent further consequences. Although this study may not represent the Pakistani population as a whole, the results are useful for primary health workers because

the patients studied represent the range of dental patients presenting to a dental hospital.

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