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ORIGINAL ARTICLE

Effect of Impacted Mandibular Third Molar on Development of Distal Caries of Second Molars

FAIQA IQBAL[1], KHADIJA ZIA[2], RAMSHA SAJID[3], AMNA NAUMAN KHAN[4], SARAH RABBANI[5], NAUMAN RAUF KHAN[6]
[1,3]House officer, College of Dentistry, Sharif Medical and Dental College Lahore
[2,5]General Dental Practitioner
[4]Professor, Community and preventive dentistry, College of Dentistry, Sharif Medical and Dental College, Lahore
[6]Professor, Oral Pathology ,College of Dentistry, Sharif Medical and Dental College, Lahore
Corresponding author: Dr. Nauman Rauf Khan, email: dr.nrkhan@gmail.com, Contact no: 03214894164

ABSTRACT

Objectives: The aim of this study was to evaluate the incidence of caries on distal aspect of mandibular second molars due to impacted third molars.

Methodology: Radiographs were obtained for the patients with clinical evidence of impacted 3rd molar. Dental records including number of impacted third molars, pathological conditions and complaints of caries, pericoronitis and recurrent pain were taken. Data of patients with visible distal caries to second molars in the absence of third molar was also recorded entered into specially formulated Performa.

Results: A total of 151 participants shared their data for research purpose. According to Winter's classification, 42.4% and 41.7% impactions were mesioangular and vertical 3rd molars respectively. According to Pell and Gregory classification more than half (55%) of the impacted 3rd molars were in Class I relationship to the ramus whereas 51% of impacted 3rd molars were at the depth of level A.

Conclusion: Caries of second more is more common if the impacted third molar tooth is mesioangulated, having class I relationship with respect to ramus.

Keywords: second molar, distal caries, impacted third molar

INTRODUCTION

Impaction is considered when there is failure of tooth ejection into standard position caused by disturbance in the eruption way, irregular positioning of a tooth, need of space, or other hindrances. The term impaction was characterized by Peterson in 1998 as a tooth that falls flat to emit into the dental curve inside the anticipated time. [1] Rate of affected third molars is more common within the mandible (90%) than the maxilla. [2,3] According to the survey, affected third molars are considered to have a much higher rate within the mandible than the maxilla. [4] The mandibular third molar erupt in the oral cavity by the age of 21 years, and this rate of incidence is higher in females than males. [5] Most frequently affected teeth are 3rd molars followed by maxillary canines and second mandibular premolars. [6]

The rising rate of the affected teeth on the dental curves has long been of concern of dental specialists and is presently considered as an open dental issue. Numerous affected third molars stay asymptomatic for a long time. In any case, impacted third molars have been related with the improvement of an arrangement of pathologic consequences which includes caries, pericoronitis, periodontitis, cystic injuries, neoplasm and pathologic root resorption.[7]

The point of affected teeth is measured utilizing the Winter's classification framework, with the help of measuring the point designed between the second and third molars' longitudinal axes of the. [8] Pell and Gregor classification approach is one of the simplest method to classify impaction of third molar, in which relation of 2nd molar is used to categorize impacted third molars. [9] The affected teeth occlusal and approximal sides are most commonly influenced. [10] Second molar caries is common and prophylactic removal of impacted third molar is considered suitable as the detection and restoration of caries is difficult and second molar can undergo recurrent caries. [11]

The position and slant of tooth play pivotal role in process of development of caries. In case of exposed mesioangular and even mandibular third molars, caries in 2nd molar is caused by occlusal surface from plaque accumulative fissure against the distal surfaces of the second molars. [12] According to a study, tooth in horizontal, inverted and mesioangular position has more risk of infectious problems. [13]

Distal cervical caries can also be caused by the contact point of third molar with second molar. The second molar tooth is at greater risk of development of caries of if its cementoenamel surface comes in contact with half erupted mesioangular impacted third molar. [14] the chance of caries isless of this contact point is above the cementoenamel junction. [15] Improper treatment of impacted third molar contributes to the development of distal cervical caries in second molar. [16]

The aim of this study was to evaluate the occurrence of distal caries of mandibular second molars due to impacted third molars.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted at Sharif Dental College & Hospital, Lahore. Using convenient sampling, radiographs were collected of patients above 18 years of age of both genders who have shown impacted third molars with complaints of pain and pericoronitis, or even without pain with impacted third molars and patient with visible dental caries on the distal aspect of second molar in the absence of third molar were included. While the patients with no adjacent mandibular second molar or those suffering from some other maxillofacial problem were excluded. Informed consent and dental records including number of impacted third molars, pathological conditions and complaints of caries, pericoronitis and recurrent pain were taken. Data of patients with visible distal caries to second molars in the absence of third molar was also recorded entered into specially formulated Performa.

Recorded data was coded and entered using SPSS statistical package version 25.0. Nominal data like gender, angulation, ramus relationship and impaction depth of impacted 3rd molar were recorded as frequency and percentages. Chi-square test was applied in order to find out association between caries on distal aspect of mandibular 2nd molars and impacted 3rd molars on the basis of angulation, ramus relationship and impaction depth by keeping the level of significance at 0.05%.

RESULTS

A total of 151 participants shared their data for research purpose. Almost half were females (50.3%) and the rest were males (49.7%).

According to Winter's classification, 42.4% and 41.7% impactions were mesioangular and vertical 3rd molars respectively (fig. 1). According to Pell and Gregory classification more than half (55%) of the impacted 3rd molars were in Class I relationship to the ramus whereas 51% of impacted 3rd molars were at the depth of level A as shown in fig. 2 and 3. Vertical and horizontal position

were classified as non-angulated while mesioangular and distoangular positions were entered in category of angular impaction. It was found that caries of subsequent tooth was more common with an angulated third molar with p value of 0.041. (Table 1)

Chi square test was also applied to find out the relationship between caries on distal aspect of mandibular 2nd molars and impacted 3rd molars on the basis of angulation, ramus relationship and impaction depth and statistically significant results were found in case of angulation of and relation to ramus with p value of 0.036 and 0.007 respectively. (Table 2).

Table 1:

	CARIES			
		PRESENT	ABSENT	TOTAL	p-value 0.041
ANGULATION	Angulated	55 (79.7%)	14 (20.3%)	69 (100.0%)	
	Non-Angulated	53 (64.6%)	29 (35.4%)	82 (100.0%)	
	Total	108 (71.5%)	43 (28.5%)	151 (100%)	

Figure 1:

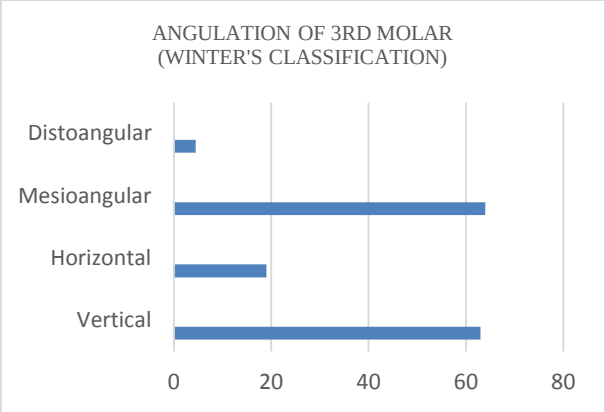

Figure 2:

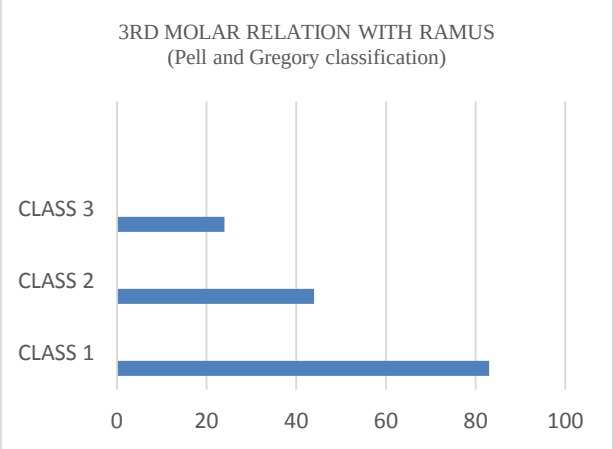

Figure 3:

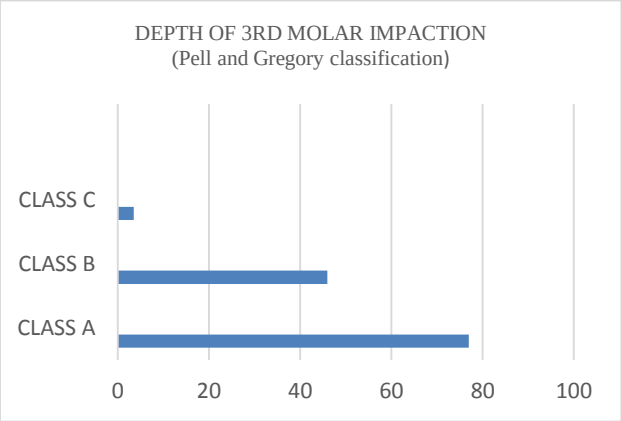

Table 2: Relationship of caries on distal aspect of 2nd molar and Impaction of 3rd molar with angulation, ramus and depth of 3rd molar

Relationship Of Caries On Distal Aspect Of 2nd Molar And Impaction Of 3rd Molar With Angulation (Winter's Classification)					
	CARIES				
		PRESENT	ABSENT	Total	
ANGULATION	VERTICAL	40 (63.5%)	23 (36.5%)	63 (100.0%)	p-value 0.036
	HORIZONTAL	13 (68.4%)	06 (31.6%)	19 (100.0%)	
	MESIOANGULAR	53 (82.8%)	11 (17.2%)	64 (100.0%)	
	DISTOANGULAR	2 (40.0%)	3 (60.0%)	5 (100.0%)	
	Total	108 (71.5%)	43 (28.5%)	151 (100%)	
RELATIONSHIP OF CARIES ON DISTAL ASPECT OF 2ND MOLAR AND IMPACTION OF 3RD MOLAR WITH RAMUS (PELL AND GREGORY CLASSIFICATION)					
	CARIES				
		PRESENT	ABSENT	Total	
RAMUS	CLASS 1	67 (80.7%)	16 (19.3%)	83 (100.0%)	p-value 0.015
	CLASS 2	25 (56.8%)	19 (43.2%)	44 (100.0%)	
	CLASS 3	16 (66.7%)	08 (33.3%)	24 (100.0%)	
	Total	108 (71.5%)	43 (28.5%)	151 (100%)	
RELATIONSHIP OF CARIES ON DISTAL ASPECT OF 2ND MOLAR AND IMPACTION OF 3RD MOLAR WITH DEPTH OF 3RD MOLAR (PELL AND GREGORY CLASSIFICATION)					
	CARIES				
		PRESENT	ABSENT	Total	
DEPTH	CLASS A	56 (72.7%)	21 (27.3%)	77 (100.0%)	p-value 0.183
	CLASS B	34 (73.9%)	12 (26.1%)	46 (100.0%)	
	CLASS C	18 (64.3%)	10 (35.7%)	28 (100.0%)	
	Total	108 (71.5%)	43 (28.5%)	151 (100%)	

DISCUSSION

Impaction of third molar tooth is most frequent occurrence with reported rate of 18-32%. [17] Tooth may fail to erupt to its normal occlusal position by expected age of 20 years due to interference by other teeth, overlying soft tissue or underlying bone. [18]

In the present study, the ratio of male to female with caries was same. Different studies on Singapore Chinese[19] and Indian [20] population showed almost similar results with slightly higher incidence in females. This slight difference may be due to different sample population. The current investigation demonstrated that occurrence of the two-sided impaction was moderately lesser than one-sided impaction. This is in contrast to that recorded by Quek et al. who found 63% bilateral impaction. [19]

Mesioangular position was the most widely recognized impaction as can be seen by the occurrence of 42.4% among all the impactions. While vertical position was second in occurrence with incidence of 41.7%. This is also seen in many other studies. Quek et al. noted mesioangular position was most common which was present in 59.5% of their population. [19] Similarly, mesioangular position was also most commonly seen by Srivastava et al. who found this position in 45% of their cases. [20]

While assessing the commonness of caries on the second mandibular molars, mesioangular impaction had fundamentally higher scores than others. The outcomes propose that the second molar distal caries legitimizes prophylactic extraction of mandibular third molar that has an angulation of 30–70° with a contact point on the cementoenamel. Extraction of a mesioangular third molar before the development of cervical caries in second molar could benefit the dental preservation of a patient. [21]

Another factor that is related with the expanded odds of creating distal cervical caries is the purpose of contact that the third molar makes with the subsequent molar. It has been seen that incompletely erupted mesioangular affected mandibular third molars which are in vicinity and contact with the cementoenamel intersection of the subsequent molar have a higher danger of creating caries in this region. [22]

There is limited data available in literature on association of the degree of angulation of the third molar and distal caries development of mandibular second molars. McArdle and Renton reported data of 122 mandibular third molars which have been extracted due to development of caries on distal cervical part of mandibular second molars. They found mesial angulation of about 40° to 80° in majority of extracted third molars. They established a strong association between development of distal cervical caries of second molar and increased mesial angulation of third molars. [23]

The extraction of mandibular third molars prophylactically, is advocated by the increased incidence of caries in the subsequent molars. Results of the current study propose that indication for mandibular third molars prophylactic extraction can be identified with mesioangular position of the affected third molar, especially when it is above 30°. Along these lines, to keep up the drawn out soundness of adjoining mandibular second molar, it is expressed that affected third molar with mesial angulation somewhere in the range of 30° and 70°, specifically, lying at Level A and Class I calls for prophylactic evacuation of the affected mandibular third molar.

This study checked for occurrence of caries in case of impacted third molar but lack the true evidence of prophylactic extraction of impacted molar teeth. This limitation can be eliminated by long term studies on preservation of 2nd molar tooth after extraction of mal-aligned or mispositioned impacted 3rd molar tooth.

CONCLUSION

Caries of second molar is more common if the impacted third molar tooth is mesioangulated, having class I relationship with respect to ramus. Prophylactic extraction of impacted 3rd molar tooth may be considered to preserve 2nd molar.

Limitation: A larger sample size and multicenter study could have helped unravel more findings.

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