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MOLAR CARIES;

DISTAL SURFACE MANDIBULAR SECOND MOLAR CARIES, EXISTENCE AND ASSOCIATION WITH PARTIALLY ERUPTED MANDIBULAR THIRD MOLAR.

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ABSTRACT… Objectives: To identify risk factor of distal surface caries on mandibular second molar associated with partially erupted mandibular third molar. **Setting:** The study was conducted in the Department of Oral and Maxillofacial Surgery, Liaquat University Hospital Jamshoro/Hyderabad from April 2013 to September2013. **Methodology:** Total 273 patients of either gender with age 16-45 years had partially impacted mandibular third molar, were included. Diagnosis was made on clinical as well as periapical view and OPG examination. Distance from CEJ of mesial surface of third molar to CEJ of distal surface of second molar was measured in millimeters. **Results:** Results about association of caries with other variables showed that significant association of caries was observed with gender, winter classification, Pell Gregory (ramus), and angulation with $p<0.01$. The association of caries was also observed with age and third molar site with $p<0.05$. The association was not significant with Pell Gregory (occlusal) and distance with $p> 0.05$. **Conclusion:** It was concluded with the results of this study that there was an increased risk of developing dental caries in 2nd molar tooth at distal surface with risk factor being partially erupted mandibular 3rd molar, mesioangular, class I, level A, and angulation of more than 30 degrees.

Key words: Risk Factor, Distal Surface Caries, Mandibular Second Molar, Partially Erupted Mandibular Third Molar.

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INTRODUCTION

Third molars are present in 90% of population, and among this population 33% have at least one impacted third molar.[1,2]

Identification of impactions can be done clinically and confirmed with radiographs such as orthopantomographs (OPG), lateral obliques and periapical view. The radiograph of choice to assess third molar impactions is the OPG radiographs.[3]

Open extraction of impacted third molars by is one of the repeatedly performed procedure in oral and maxillofacial surgery.[4,5] Numerous factors are responsible for mandibular third molar impaction, which includes deficient space in dental arch, unfavourable path of eruption, density of overlying hard and soft tissues, and the late eruption sequence[6]. Occasionally orthodontic, prosthodontic, restorative and prophylactic consideration can justify the removal.[7,8]

Many impacted mandibular third molars remain asymptomatic for years, but to prevent future complications and pathologic conditions they are often surgically extracted.[9] Pericoronitis, mandibular angle fracture, cystic lesion, and caries of the mandibular 2nd molars are the potential pathologies which are known to be caused by impacted third molars.[10,11]

The caries on the mandibular second molar are often seen and have occurred due to presence of partially erupted third molar and their varies between 7% to 32%.[8,12] Mesioangular or horizontally angulated partially erupted mandibular third molars that get in touch with the amelocemental junction of second molar set this tooth at danger of developing dental caries in

distal cervical region and results in exposure of the distal root surface of the second molar to the oral environment.[9]

Distal caries in the second molar requires a restorative and endodontic management like RCT to preserve the second molar in addition to the removal of third molar, at times extraction of the 2nd molar is also indicated, i.e when the carious lesion is too large to be restored.[5,7] Preventive extraction of the mandibular third molars can be recommended as a treatment method for improving the prognosis of mandibular second molars.[9,13]

Recently there are some guidelines which have been published for the management of mandibular third molars.[14] According to National Clinical Guidelines for management of unerupted and impacted third molar teeth, there is strong indication for removal of third molar when there is caries in the adjacent second molar tooth which cannot adequately be treated without the taking away of the third molar.[15]

Data Collection Procedure

All patients presented in outpatient department with partially impacted mandibular third molar were selected for study. Informed Consent from patient was taken for participation in this study. Diagnosis was made on clinical as well as radiograph (periapical view and OPG) examination. Variable examined were age of patient, gender of patient, angulation of third molar, and relationship with ramus and occlusal surface according to pell Gregory classification, distal caries of second molar were also observed on radiograph (periapical view and OPG) Analysis of data was done on SPSS version 17.0.

RESULTS

Results showed that out of 273 there were 118 male patients and 155 female patients. Caries on distal surface of second molar was found in 65 patients. The frequency distribution and caries association is presented in Table-I.

	Caries at 2nd Molar Distally			
	No (n=208)	Yes (n=65)	Total	P-Value
Male (n=118)	74	44	118	0.000*
Female (n=155)	134	21	155	
Total	208	65	273	

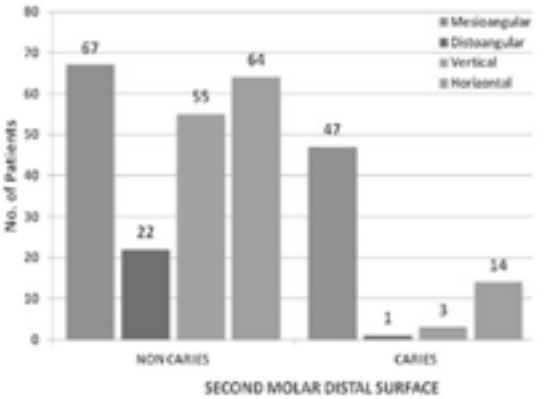
Table-I. Frequency and association of caries at 2nd molar tooth distally according gender (n=273)
Chi Square Test was applied.
P-value ≤0.05 considered as significant
* Significant at 0.01 level

The overall age of patients was divided in two groups. 164 patients were belonged to group of age 16-25 years and 109 patients were belonged to age group 26–45 years as shown in Table-II.

	Caries at 2nd Molar Distally			
	No (n=208)	Yes (n=65)	Total	P-Value
16–25 years (n=164)	133	31	164	0.020**
26 – 45 years (n=109)	75	34	109	
Total	208	65	273	

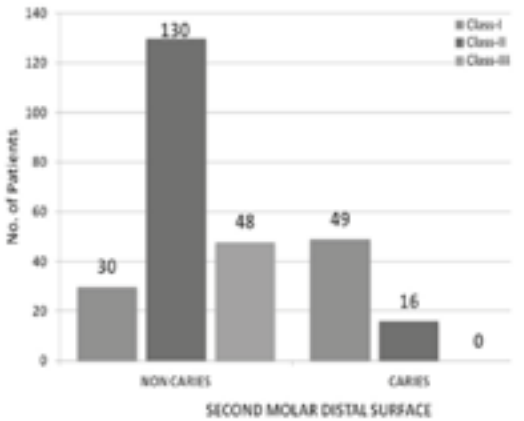
Table-II. Frequency and association caries at 2nd molar distally according age groups (n=273)
Chi Square Test was functional.
P-value ≤0.05
** Significant at 0.05 level

Winter classification showed 41.8% mesioangular, 8.4% distoangular, 21.2% vertical, and 28.6% horizontal. The frequency distribution is presented in Figure-1.



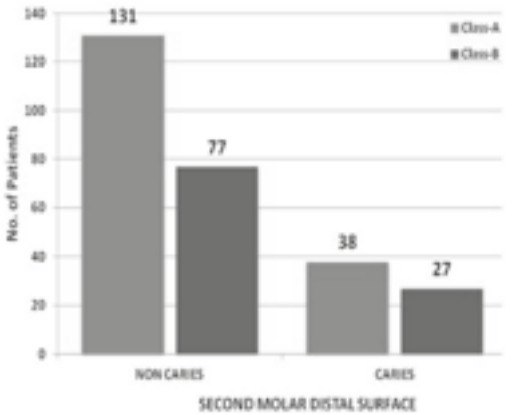
Figure–1. Frequency of second molar distal surface according winter classification (n=273)

In overall Pell Gregory (ramus), class I was observed in 79 patients, class II was observed in 146 patients, and class III was observed in 48 patients. The frequency distribution is presented in Table-8. And in Pell Gregory (occlusal) class-A was observed in 169 patients and class-B was observed in 104 patients. The frequency distribution is presented in Figure-2.



Figure–2. Frequency of second molar distal surface according pell gregory (ramus) (n=273)

As far as overall angulation is concerned, -32 to -1 degree was observed in 30.4%, 0 to 29 degree was observed in 43.6%, and 31 to 108 degree was observed in 26.0%. The frequency distribution is presented in Figure-3.



Figure–3. Frequency of second molar distal surface according pell gregory (occlusal) (n=273)

The evaluation of distance among overall cases showed 1 to 2 mm in 51.6% and 3 to 10 mm in 48.4%. The frequency distribution is presented in Table-III.

	Caries at 2nd Molar Distally			
	No (n=208)	Yes (n=65)	Total	P-Value
-32 to -1 Degree (n=83)	73	10	83	0.000*
0 to 29 Degree (n=119)	100	19	119	
30 to 108 Degree (n=71)	35	36	71	
Total	208	65	273	

Table-III. Frequency and association caries at 2nd molar distally according angulation (n=273)
Chi Square Test was functional
P-value ≤0.05
* Significant at 0.01 level

The final outcome among overall study subjects showed that caries on second molar distal surface was not observed in 208 cases and observed in 65 cases. The frequency distribution is presented in Table-IV.

	Frequency (n)	Percentage (%)
No	208	76.2%
YES	65	23.8%
Total	273	100%

Table–IV. Frequency distribution of overall patients according to caries at 2nd molar tooth distally (n=273)

DISCUSSION

Historically, 3rd molar tooth was common practice to remove prophylatically but majority of studies have claimed that there is insufficient data to support such type of practice.[16,17] Only guidelines of National Institute for Clinical Excellence were used currently in Wales and England.

In our study females were found in majority with partially impacted mandibular third molar, which is supported by the data of study carried out by Sheikh AM[18] where he found 50.5% females.

164 patients reported with the age group of 16 to 25 in this study, as it is the common age of tooth being partially erupted. The study of Syed KB[19] also shows patients with high rate of impaction in third decade of life.

The prevalence of distal surface caries in this

study is 23.8%. The authors observed in past studies that the prevalence of distal caries on mandibular 2nd molars associated to the presence of a mandibular third molar was 7% in the study of Chu FC[20] and 32% in the study of vander Linden W.[21]

As the literature had already stated that mesioangular is the common pattern of impaction, our study also confirms previous author's results. The current study is in agreement with those of Quek et al[22] Kramer and Williams[23] where they encounter mesioangular angulated tooth in 33.5% cases. However, the findings are in contrast with Hugoson and Kugelberg[24] who found the vertical angulation to be the most common.

According to the results of Mc-Ardle and Renton study which was done with removal of 122 impacted 3rd molar teeth and that extraction of third molar tooth was done due to its mesioangular angulations which was causing dental caries on distal side of 2nd molar tooth.

In this study most of the patients were found with third molar angulation of 0 to 29. Over all very few studies are conducted on the degree of angulations of the third molar and caries development on distal aspect of 2nd molar teeth

The Results of this study provide evidences that distal caries in 2nd molar teeth is directly associated with the angulations of impacted 3rd molar particularity when its angulations is about 30^0 in mesio-angular direction. If above said type of impacted 3rd molar tooth will be extracted than there will be less chances of formation of caries at 2nd molar distal surface tooth.

In array to sustain the long term health status of adjacent mandibular 2nd molar tooth, it was hypothesized that impacted third molar with mesial angulations between more than 30 degree in meticulously lying at Class I and class A validate timely or prophylactic extraction of mandibular 3rd molar tooth.

CONCLUSION

It was concluded with the results of this study that there was an increased risk of developing dental caries in 2nd molar tooth at distal surface with risk factor being partially erupted mandibular 3rd molar, mesioangular, class I, level A, and angulation of about or more than 30 degrees. It was also concluded that there is association between partially erupted mandibular third molar and 2nd molar distal aspect in development of dental caries.

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2	Dr. Syed Ghazanfar Hassan	Acquisition of data	
3	Dr. Suneel Kumar Punjabi	Plagiarism check analysis and interpretation of data	
4	Dr. Soonhan Abdullah	Acquisition of data and drafting of manuscript	