
CORRELATION OF MANDIBULAR SECOND MOLAR CARIES WITH PATTERNS OF MANDIBULAR THIRD MOLAR IMPACTION: A RETROSPECTIVE STUDY

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ABSTRACT

OBJECTIVES

The aim of this study was to evaluate the relation of distal caries of second molar with patterns of impacted third molar.

METHODOLOGY

A retrospective study was carried out from January 2017 to June 2017. A total of 160 patients and 276 impacted teeth were selected with an age > 18 years. A single researcher assigned the diagnosis of caries and patterns of impacted teeth through clinical notes and orthopantomogram (OPG) which was reviewed by Head of Department. Winter's and Pell and Gregory classification was used for impaction classification. The data was analyzed using SPSS 22.0 version. $P \leq 0.05$ was considered as statistically significant.

RESULTS

Female (56.3%) were predominant than male (43.8%) with mean age presentation was 24.2 ± 4.7 years. 271 mandibular second molars were present. Vertical (64.5%) impaction was found to be the most frequent followed by mesioangular (19.6%). Pearson correlation showed that vertical impaction was significantly related to distal caries of second molar (Right side, $r = .262$ $p = .002$ and Left side, $r = .240$ $p = .006$).

CONCLUSION

Vertical impaction was positively related with distal caries therefore prophylactic removal of lower impacted teeth is recommended.

KEYWORDS

Third molar, patterns, second molar, caries.

INTRODUCTION

Impaction is the inability of tooth to erupt in the dental arch within the specified time period and may be due to the obstruction in the path of eruption, inappropriate positioning of tooth and absence of space or any other obstacles.¹ The most frequent impacted teeth are mandibular third molars which started at an age of 16 years and could hamper until 18-20 years.² Impacted mandibular third molars predominantly involved females than males.³ Various pathologies are associated with impacted lower third molar and this could be due to the disparate angulation and position.⁴⁻⁶ Retained lower third molar is the risk factor for second molar and frequently initiates periodontal pockets or decay on lower second molar.⁷ Impacted third molars do not engage in mastication and provide more beneficial environment for bacterial accumulation.⁸ However, a remarkable percentage of lower third molar with free of pathology for a prolonged duration have shown in the studies.⁴⁻⁶

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The most acceptable classification of impacted teeth was described by Winters and Pell and Gregory. Winter's illustrated the angulations of impacted tooth with longitudinal axis of adjacent tooth while Pell and Gregory classify the level of impaction of lower third molar in relation to the ramus and occlusal level of second molar.^{9,10} The objective of this study was to determine the incidence and correlation of caries in the lower second molar with different angulations and impaction's level of lower third molar.

METHODOLOGY

A review on the patient's record was carried out from January 2017 to June 2017 on all those who encounter extraction of lower third molar impaction. A total of 160 patients who came to the Department of Oral and Maxillofacial Surgery, Sardar Begum Dental College and Hospital, Peshawar were evaluated with an age above 18 years. The diagnosis of caries and angulation of lower third molar was carried out by a single researcher and reviewed by the head of department. The data were collected from the clinical notes and orthopantomogram (OPG). The age, gender, presence, location, depth, angle of impaction of third molars and caries of second molars were noted. All those patients who received any trauma or having pathosis to the jaw which results in occlusal disruption and patients with systemic diseases were excluded from this study. The angulation of impaction was classified according to Winter's classification.⁹ The angulation of impaction was measured using Quek et al's classification system: mesioangular impaction at 11° to 79°; vertical impaction at 10° to -10°; distoangular impaction at -11° to -79°, and horizontal impaction at 80° to 100°.¹¹ The level of impaction in relation to ramus (Class I, II and III) and occlusal level (Class A, B and C) respectively was determined using the Pell and Gregory classification.¹⁰ The data was analyzed using SPSS 22.0 version. $P \leq 0.05$ was considered as statistically significant. Pearson correlation was applied to show a relation of second molar caries and patterns of third molar impaction.

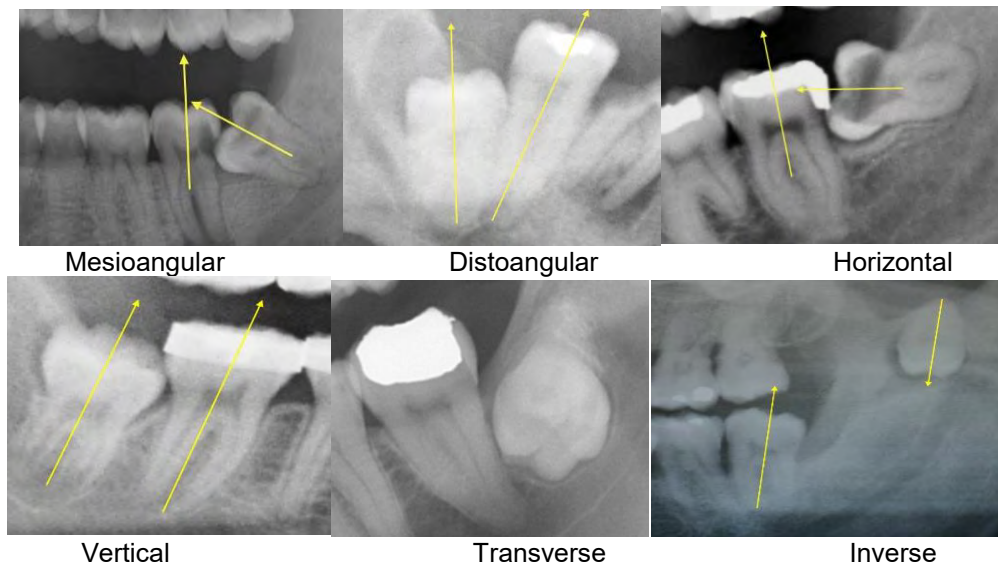


Figure.1. Winter's classification of lower third molar impaction.

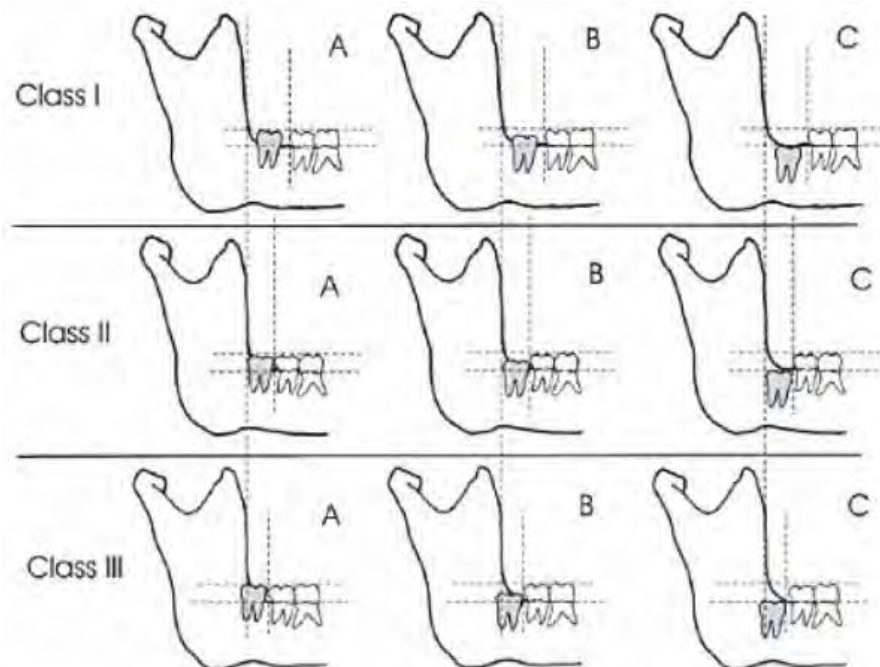


Figure.2. Pell and Gregory's classification of lower third molar impaction.

RESULTS

The mean age presentation was 24.2 ± 4.7 years. Among 160 patients male were $n=70(43.8\%)$ and female were $n=90(56.3\%)$. The female to male ratio was 1.3:1. A total of 276 lower impacted molars and 271 second molars were included in this study. The most frequent pattern of impacted teeth in terms of angulation was vertical $n=178(64.5\%)$ followed by mesioangular $n=54(19.6\%)$. According to Pell Gregory classification the position of impacted tooth was $n=194(70.3\%)$ third molars in Class A, $n=64(23.2\%)$ in Class B, and $n=18(6.5\%)$ in Class C relationship while $n=185(67.0\%)$ were Class I, $n=69(25\%)$ Class II and $n=22(7.97\%)$ in Class III as shown in table 1. Distal Caries were most frequently found in right side (44.4%) than left side (37.5%). A total of $n=131(48.3\%)$ distal caries were present with impacted teeth. Pearson correlation showed that distal caries were significantly related with vertical impaction (Right side, $r=.262$ $p=.002$ and Left side, $r=.240$ $p=.006$), depth (Right side, $r=-.314$ $p=.001$ and Left side, $r=-.332$ $p=.001$) in both sides. Distal caries of second molar with ramus were statistically found significant on right side ($r=-.172$, $p=.043$) while left side showed insignificant ($r=-.160$, $p=.067$). Pearson correlation demonstrated that as the ramal and depth of impaction increases the incidence of caries significantly decreases.

DISCUSSION

This study revealed that the most common impaction found was vertical 64.5% amongst all impactions. This can be supported by other studies which found vertical impaction to be the most frequent impaction.^{12,13} Byahatti¹⁴, Kruger¹⁵ and Srivastava¹⁶ found that mesioangular impaction was most common type of impaction which is contrary to our study and the difference may be due to the different classification system used and geography.

The incidence of distal caries in second molar is influenced by occlusal angulation and depth of impacted third molar with second molar.^{17,18} Ozec et al in their series found that the prevalence of distal caries of second molar was 20% with impacted teeth and suggested that caries formation in second molar was due to the contact point on cement-enamel junction and with increasing age.¹⁷ This study contradict

this study which showed 48.3% caries in the second molar. Falci et al in their study exhibit the prevalence rate of distal caries with impacted and found to be 13.4% which is in contrary to this study.¹⁹ Syed et al revealed that distal caries in second molar was 39 % which almost support this study.²⁰ Silva et al²¹ demonstrated that males were predominant than females which opposes this study however, they disclosed that distal caries was most frequently involved with vertical impaction which assist the present study. Syed²⁰, Allen²² and Bruce²³ reported that mesioangular impacted third molar was the utmost reason for causing caries on the distal surface of the second molar which does not support this study. The difference may be attributed due to a wide age range in the study populations. The limitation of this study was the use of orthopantomogram instead of intraoral radiograph which may be deficient in detecting inter proximal caries. Apart from this, the present study thoroughly revealed the age involved patterns of mandibular impaction and distal caries of second molar. The correlation of patterns of mandibular impaction with the distal caries of second molar is uniqueness to this study.

For further appraisal it is advisable to carry out a prospective study with long term follow up on the role of impacted lower third molar with distal caries of second molar.

CONCLUSIONS

Vertical and class A and Class I impaction is the most common type of impaction which is related to distal caries of second molar and females is the predominant gender.

RECOMMENDATIONS

Prophylactic removal of impacted third molar is the legitimate reason due to incidence of distal caries.

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CONFLICT OF INTEREST

None to declare.

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