

Incidence Of Residual Periodontal Defects Distal To Second Molar Due To A Mesioangular Mandibular Impacted Third Molar

Research Article

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Abstract

The objective of this study was to verify whether periodontal bone loss, when present on the distal surface of the adjacent second molar is associated with the presence of mesioangularly impacted mandibular third molar. A retrospective study was carried out for 228 patients who reported to the department of Oral and Maxillofacial surgery, Saveetha Dental College, Chennai from June 2019 to April 2020. Records and pre-extraction radiographs were retrieved and the second molars were compared for any periodontal bone loss on the distal aspect due to the presence of a mesioangular impacted mandibular third molar. Out of the total 228 patients, 100 (43.86%) patients showed incidence of periodontal defect in the second molar associated with the presence of mesioangular impacted mandibular third molar showing a male predilection (67%), but this was statistically not significant ($P>0.05$) The results suggested that periodontal breakdown was initiated and established which was presented as pre-extraction radiolucency in association to the distal surface of second molar in the vicinity of a mesioangular impacted mandibular third molar.

Keywords: Periodontal Defect; Bone Loss; Mesioangular Third Molar; Second Molar.

Introduction

The molars are the last teeth to erupt into the dental arch and have shown to be the most frequently impacted teeth in all human races [1]. Eruption and exposure of the third molar to the oral environment, third molars are more susceptible to periodontal infection leading to periodontal breakdown of tissues [2]. Forty years ago, Ash et al [3, 4] cautioned that periodontal pathology affecting the distal of second molars with adjacent third molars had been overlooked. Earlier, clinicians had assumed that periodontal infections on the distal surface of second molars were the direct result of third molar removal [5]. But lately, Blakely et al [6] reported 25% of 329 patients detected pathology in the third molar region, distal to second molar or around the adjacent third molar. If the third molar was not considered, these patients were periodontally sound. Impacted or partially impacted molars often

show distal attachment loss in the second molar and its magnitude will depend on the situation and the type of impaction.

Third molars impacted in the root surface of the second molar make them vulnerable to distal attachment loss leading to elimination of the interdental bone separating them. This results in periodontal pocket formation leading to pericoronitis and further infection [7]. If the third molar is in close proximity to the second molar, the weakening of interdental bone gives way to periodontopathogenic bacterial aggression [7]. Partially impacted third molars present on active source of bacterial entry into the distal area of the second molar due to retention of food and poor hygiene [8, 9]. Some authors suggest a timely prophylactic removal to prevent possible pathological changes around the impactions and adjacent second molars [8]. Thus the effect of a mesioangular third molar to the investing and supporting structures of adjacent

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second molars is of significance.

Previously our team has a rich experience in working on various research projects across multiple disciplines [10-24]. the aim of the study is to verify the periodontal bone loss conditions of mandibular second molars associated to a mesioangular impacted mandibular third molar.

Materials And Methods

Study setup

The retrospective study consisted of a list of 228 patients who had undergone surgical removal of mesioangular impacted third molars in the Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Chennai. A total of 86000 patient records were reviewed and analysed from June 2019 to March 2020.

Inclusion and exclusion criteria

Inclusion criteria of this study was:

- Patients above 18 years of age
- Patients presenting with a mesioangular impacted molar
- History of pain
- Tenderness on percussion of mandibular second or third molar
- Pericoronitis or any other periodontal pathology

Exclusion criteria were:

- Incomplete treatment records such as missed radiographs
- Surgical extraction of a non-impacted erupted mandibular third molar
- Related second molar was missing
- Cystic or neoplastic changes associated with the impacted third molar
- Patients undergoing orthodontic treatment
- Systemic diseases such as diabetes mellitus or valvular heart
- Pregnancy

Study parameters

The clinical records of the patients were reviewed. Subject's age, gender were also noted. The pre-extraction panoramic , high quality periapical or bitewing radiographs of each subject was studied. Impaction pattern as well as crestal radiolucency presenting bone loss of crestal bone between the mandibular second and third molar were taken into consideration. Mesioangular patterns were

included i.e. if the convergence angle towards the coronal aspect between the long axis of the second and third molars was greater than 30 degrees. Crestal radiolucency with an ill defined crestal margin from the crown of the third molar is greater than normal follicular space was considered.

The radiograph was used to classify the third molars. Depth of impacted lower third molars in relation to the occlusal plane and the space between the ramus and the distal second molar was recorded according to the classification of Pell and Gregory .

Data collection

The data related to the stay parameters were obtained from among the patients who reported to the Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Chennai from June 2019 to March 2020. An approval for the designed study was obtained from the Institutional Ethical Committee of Saveetha University (Ethical approval number SDC/SIHEC/2020/DI-ASDATA/0619-0320). An informed verbal and written consent was obtained after explaining the nature of the study. Data was kept confidential and the hospital's computerised records were obtained.

Data analysis

The IBM SPSS (version 23.0) software was used to tabulate and analyse the collected data. Non parametric data was analysed using descriptive statistics measuring frequency and percentage. Pearson's chi square test was used to assess the association between bone loss distal to second molar due to mesioangular mandibular impacted molars and age as well as gender.

Results And Discussion

This study examined 176 patients out of which 140 (61.4%) were males and 88 (38.6%) were females. The mean patient age was 28.32 years with the maximum number of patients in the 21-35 year age group [Figure 1] . According to the Difficulty index, 120 (52.63%) were minimally difficult, 100 (43.8%) were moderately difficult and 8 (3.5%) were very difficult. According to Pell and Gregory classification, 114 (50%) were classified as position A and 112 (49.12%) were classified as Class I [Table 1]. Regarding the periodontal parameters, 100 (43.9%) subjects showed the presence of crestal radiolucency on the distal aspect of the adjacent second molar associated to a mesioangular impacted mandibular third molar [Figure 2]. The age group showing maximum number of patients with periodontal bone loss was 22-5

Figure 1. The pie chart depicts the age related baseline characteristics of patients. 57.8% of patients were in the age group of 21-30 years. From this, we can infer that the maximum number of patients belonged to the 21-30 years age group.

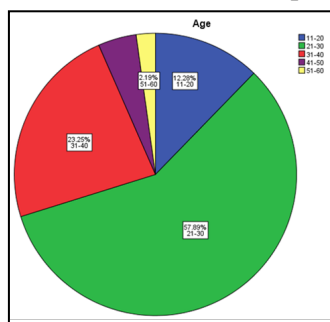


Figure 2. The pie chart represents the Incidence of bone loss distal to adjacent second molars due to lower impacted third molar. From this chart, we can infer that 43.96% of the patients showed bone loss distal to adjacent distal molar.

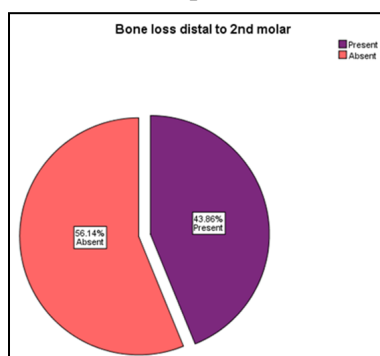


Figure 3. The above bar graph represents the association between age and the bone loss distal to the second molar due to a mesioangular mandibular impacted third molar. X axis represents the age, Y axis represents the number of patients showing bone loss distal to second molars. From this graph we can infer that the maximum number of patients with presence of bone loss distal to second molar belonged to the age group of 21-30 years. Chi square test was done showing no statistical significance between age and bone loss distal to second molars. $P=0.112$ ($P>0.05$).

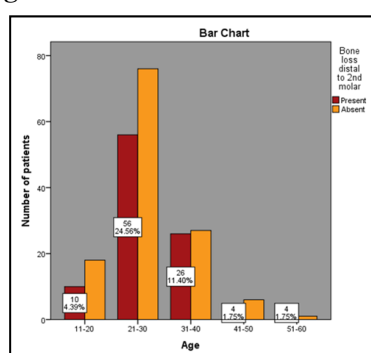
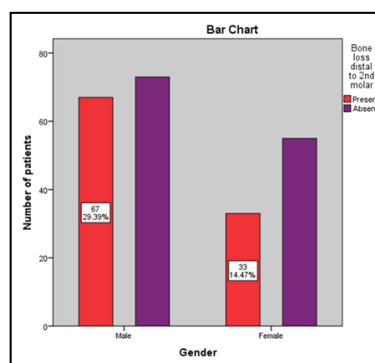


Figure 4. The above bar graph represents the association between gender and the bone loss distal to the second molar due to a mesioangular mandibular impacted third molar. X axis represents the gender, Y axis represents the number of patients showing bone loss distal to second molars. From this graph we can infer that males (67%) more commonly show peri-odontal defect distal to the second molar in comparison to females (33%). Chi square test was done showing no statistical significance between gender and bone loss distal to second molars. $P=0.081$ ($P>0.05$).



years with a mean of 29 years [Figure 3]. Males (67%) presented more frequently with periodontal bone loss when associated with a mandibular mesioangular impacted third molar in comparison to females (33%) [Figure 4]. However the p value for both the tests of association between bone loss distal to second molar due to mesioangular mandibular impacted molars with age as well as gender was >0.05 , thus it was statistically not significant. The side of periodontal bone loss distal to the second molar was on the left for 54 cases and on the right for 46 cases. With respect to difficulty index cases having a periodontal defect were minimally difficult, 48 were moderate and 2 were very difficult. Based on Pell and Gregory's classification, 43 showing periodontal bone loss were Class I and 53 were Class II and 4 were class III. Whereas, 46 were position A, 48 were position B and 6 were position C.

Data remains confined in regards to the long term effects of unerupted third molars on adjacent teeth. However, the current data states that the retention of third molars is associated with increased risk of second molar disease [8]. Marciani et al (2012) [25] states that retained asymptomatic third molars pose a risk for second molar pathology. Elter et al [5] stated that the visible third molar can be associated with twice the odds of periodontal problems on the adjacent second molars. Similarly, Nunn et al [8] stated the incidence of second molar periodontal pathology was more in the presence of an adjacent third molar. These studies could be compared favourably to our present study. Blakely et al [26] showed incidence of periodontal defect distal to second molar prior to surgery to be 42%. However, Marciani et al [25]

Table 1. The table depicts the Impaction characteristics of the study sample. It shows that minimally difficult, Position B and Class II characteristics of the impacted teeth showed greater number of patients presenting with bone loss distal to second molar.

Characteristics of the impacted teeth	Total cases N (%)	Cases showing periodontal bone loss
DIFFICULTY INDEX:		
Minimally difficult		
Moderately difficult	120(52.6)	50
Very difficult		
	100 (43.8)	48
	8(3.5)	2
PELL AND GREGORY- POSITION		
Position A		
Position B	114(50)	46
Position C	96(42.1)	48
	18(7.89)	6
PELL AND GREGORY- DEPTH		
Class I		
Class II	112(49.1)	43
Class III	106(46.5)	53
	10(4.38)	4

showed a much lower rate of incidence in comparison. Elter et al [5] stated that periodontal defect was more likely to be found in the mandibular arch and in males, and this compared favourably to our study. However, Sofie et al [27] showed higher female predilection instead.

Nunn et al [8] stated the increased risk of incident second molar pathology in “bony” impactions in comparison to soft tissue impactions. Our study showed the greater frequency of periodontal pathology in Class II (53%) and Position B (48%) type of impactions. These findings are consistent with the current knowledge of periodontal disease that indicate acquisition of recognised periodontal pathology identification of the initiation and progression of the disease. We urge patients and their corresponding dentists to carefully weigh the treatment modalities when any crestal bone adjacent to the second molar or around the third molar region is detected. Bearing in mind that periodontal pathology in the third molar region is difficult to treat effectively, the more prudent option is early diagnosis of the periodontal pathology and probably followed by third molar removal [26]. Blakely et al [26] also stated the initiation of periodontal pathology in the third molar region is relatively more in young patients, on study also is in favour of it. However, Nunn et al [8] associated the risk of second molar pathology to middle aged and older adults. Our institution is passionate about high quality evidence based research and has excelled in various fields [28-38].

The limitations of the present study include better periodontal assessment needs to be done in regards to the second and third molar. There also remains a need for additional evidence required for making a better clinical decision for the management of the unerupted third molars. The current study did not include oral hygiene status as well as the periodontal pathogens which needs to be evaluated further in detail.

Conclusion

Based on the findings of this retrospective study, it is recommended that oral health care workers should pay attention and identify signs of established periodontal breakdown on the distal aspects of mandibular second molars while evaluating the clinical state of the adjacent mesioangular impacted mandibular third molars. Within the limits of the study, the incidence of periodontal bone loss distal to the second molars when associated with an adjacent third molar was 43.86%. It showed slight male predilection and was found more frequently in the young adult population. It also showed association to the depth of impaction.

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