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POSITION OF MANDIBULAR THIRD MOLAR AS A RISK FACTOR FOR ACUTE PERICORONITIS

Dental Science

Dr Vivek Bikram Thapa MDS, Lecturer Department Of Orthodontics KMC Dental College and Hospital Kathmandu – 21266 Nepal

Dr Mohit Sharma MDS, Lecturer Department Of Oral Medicine and RadiologyKMC Dental College and Hospital Kathmandu – 21266 Nepal - Corresponding author

Dr Amrita MDS, Lecturer Department Of orthodontics KMC Dental College and Hospital Kathmandu – 21266 Nepal

Dr Prabesh Sherchen MDS, Lecturer Department Of Orthodontics KMC Dental College and Hospital Kathmandu – 21266 Nepal

ABSTRACT

Objective: Describe positional characteristics of the mandibular third molar at highest risk for acute pericoronitis using clinical and radiographic features

Methods: Fifty subjects of either gender in the age range of 18-35 years with a clinical diagnosis of acute pericoronitis constituted the study group. Following a complete clinical examination, standardized panoramic radiographs for each of the study subjects was made. Two clinical and two radiographic parameters were evaluated as potential predictive factors for the development of acute pericoronitis. The findings were recorded in the patient's respective proformas specially designed for the study. Chi-square test was used to determine the predictivity of the individual factors in the development of acute pericoronitis

Results: Vertical impaction was the most frequent angulation (35 cases) while distoangular was the least (02 cases). The frequency of partial (50%) occlusal coverage by operculum (29 cases) outnumbered 25, 75 and 100% coverage (21 cases). Regardless of the type of impaction, 50% occlusal coverage by operculum was most frequently encountered. Presence of an opposing impinging maxillary tooth was noted in 35 cases, while the same was absent in 15 cases.

Conclusions: Vertical angulations, partial (50%) encapsulation, eruption level below or at the occlusal plane and presence of an impinging opposing maxillary tooth are among the important determinants of the development of pericoronitis prophylactic extractions should be advised in such cases.

KEYWORDS

Pericoronitis, impacted third molars, angulations.

INTRODUCTION

Among the most frequent problems encountered by oral physicians are symptoms related to unerupted mandibular third molars.[1] Approxi mately 9.5 to 39% of mandibular third molars fail to emerge into the oral cavity.2 Pericoronitis is among the most frequently encountered pathosis associated with impacted mandibular third molars3. Owing to the hazards associated with acute pericoronitis, prophylactic removal of teeth subject to greatest risk has been recommended.[1,2,3]

Impacted third molars and problems and complications associated with it most frequently seen in second and third decade of life . Most of the patient those undergo orthodontic treatment fall within this age group . Any patient undergoing orthodontic treatment will require a standardized panoramic radiographs as part of their essential diagnostic tool. Hence, using this radiograph along with clinical evaluation a precise description of the impacted mandibular third molar at highest risk for acute pericoronitis may enable addressing impaction with a preventive perspective. This study thus aims to describe the characteristics of mandibular third molars afflicted with acute pericoronitis employing clinical and radiographic features.

MATERIALS AND METHODOLOGY

The Dental hospital setup of Kathmandu Medical College and dental hospital , Duwakot, Nepal has a a fully functional panoramic radiograph machine (planmaeca promax , Helsinki, Finland , under simailar condition - 80Kvp, 12mA, 18s). Since any patient undergoing orthodontic treatment will require a standardized panoramic radiographs as part of their essential diagnostic tool . The type of paitent seeking orthodontic treatment usually are young adults hence this data were easily available .Fifty subjects of either gender in the age range of 18-35 years with a clinical diagnosis of acute pericoronitis constituted the study group. A diagnosis of acute pericoronitis was made based on the clinical criteria suggested by Leone et al.[3] Patients with a history of surgeries pertaining to the posterior mandible, mandibular third molars with dental caries/gross anomalies and the absence of adjacent mandibular first or second permanent molar constituted the exclusion criteria.

The subjects thus included in the study were explained in detail about the study. A written informed consent was obtained from those voluntarily willing to be a part of the study. An institutional ethical clearance was obtained prior to the conduct of the study.

Following a complete clinical examination, standardized panoramic radiographs (palnmaeca promax , Helsinki, Finland , under simailar condition - 80Kvp, 12mA, 18s) for each of the study subjects was made.

Two clinical and two radiographic parameters were evaluated as potential predictive factors for the development of acute pericoronitis. The clinical parameters assessed were the percentage of occlusal coverage by operculum and tissue impingement by an opposing maxillary tooth. The former was recorded as a visual estimate in 25, 50, 75 and 100%. The latter was accomplished by direct visual inspection of the afflicted region and an opposing maxillary third molar. Malpositioned or supraerupted maxillary third molar teeth impinging over the affected area was also recorded.

Under ideal viewing conditions, the radiographic parameters evaluated included the level of eruption of the mandibular third molar and the mandibular third molar angulation. The former was adjudged as being above, at or below the occlusal plane, depending on the position of the crown of the affected third molar relative to the occlusal plane. Third molar angulation was determined employing the criteria adapted by Leone et al.[3] The angle between the occlusal plane of the impacted mandibular third molar and the occlusal plane of the adjacent first and second molars was determined (fig. 1). Depending on these angulations, the type of impaction was determined as follows:[3]

1. 3550 – 300 = Vertical

2. 350 – 650 = Mesioangular
3. 700 – 1650 = Horizontal
4. 2450 – 3500 = Distoangular

The findings were recorded in the patient's respective proformas specially designed for the study. Chi-square test was used to determine the predictivity of the individual factors in the development of acute pericoronitis. Significance was set at p less than equal to 0.05. For all statistical analysis, the SPSS (version 16) software was used.

RESULTS

30 males and 20 females in the age range of 18-35 years comprised the study group. The mean age for the men and women was 24.53 and 24.15 yrs respectively. Of the 50 impacted mandibular third molars evaluated, 27 were present on the right side and 23 on the left.

Vertical impaction was the most frequent angulation (35 cases) while distoangular was the least (02 cases). The frequency of partial (50%) occlusal coverage by operculum (29 cases) outnumbered 25, 75 and 100% coverage (21 cases). Regardless of the type of impaction, 50% occlusal coverage by operculum was most frequently encountered. Presence of an opposing impinging maxillary tooth was noted in 35 cases, while the same was absent in 15 cases. With the exception of horizontal impaction, the presence of opposing tooth was noted most commonly in each type of impaction. Majority of the cases (37 cases) were situated below the occlusal plane of the adjacent mandibular first and second molar. The same was true for each type of impaction studied.

The Chi-square test revealed a statistically significant impact of all the four parameters evaluated on the development on acute pericoronitis. The gender did not appear to have any statistically significant impact on any of the four predictive parameters assessed.

DISCUSSION

Literature highlights the significance of positional characteristics of impacted mandibular third molars on the development of several pathologies.[2,3,4,6,7,8] One among the most commonly associated pathosis is pericoronitis which refers to infection of the soft-tissue/operculum overlying the crown of a partially impacted tooth.4 Acute pericoronitis manifests most commonly in young adults and accounts for 10% of mandibular third molars extracted.[2,4] The bacteria frequently associated with pericoronitis are Peptostreptococcus, Fusobacterium, and Bacteroides (Porphyromonas).[5] Trauma from an opposing tooth has also been suggested as an etiologic factor.[5]

According to the present study, all the four parameters assessed had a statistically significant impact on the development on acute pericoronitis. 70% of the cases included in this study were associated with a vertical inclination. This reflects the most common type of impaction in the population studied. In an attempt to attain its normal position into the oral cavity a vertically impacted tooth may impinge the mucosa more cogently from beneath as opposed to its other impacted counterparts and result in acute pericoronitis. This finding is in harmony with the studies conducted in the past. [2,3,8]

Regardless of the type of impaction, 74% of the affected molars were located below the occlusal plane of the adjacent tooth. Acute pericoronitis in these cases could have resulted from supraeruption or malalignment of an opposing maxillary tooth. It was observed that 58% of the afflicted molars demonstrated partial soft tissue coverage. 50% operculum coverage provides greater surface area of interface between the operculum and the tooth leading to increased accumulation of local irritants, thus predisposing to acute pericor onitis. Opposing impinging maxillary tooth was noted in 70% of the cases. Pericoronitis in these cases could have resulted from trauma to the operculum. In the current study, the incidence of the presence of an opposing impinging tooth was relatively higher for distoangular and mesioangular impactions. These findings are in accordance with the study conducted by Halverson and Anderson.[8]

The gender did not have any statistically significant impact on any of the four predictive parameters evaluated in the present study. This is in agreement with the study conducted by Yamalik and Bozkaya.[2]

CONCLUSION

Based on the assessment of the parameters investigated in this study, most likely to be among the essential determinants of acute pericoronitis are vertical angulations, partial (50%) encapsulation, eruption level below the occlusal plane and presence of an impinging opposing maxillary tooth. Prophylactic extractions may thus be recommended in such cases, as a delay may result in grave complications. All patients with impacted third molars should be evaluated and the treatment planned based on their individual presentation.

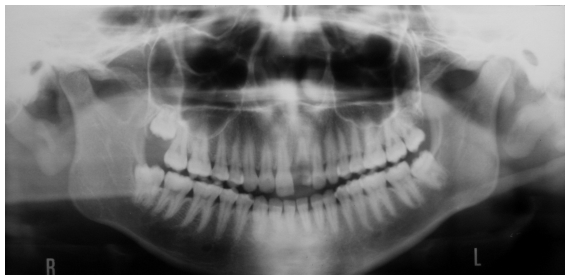

Figure 1.

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