Evaluation of mandibular third molar position as a risk factor for pericoronitis: A CBCT study

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Abstract

Aims: The present study was conducted to evaluate mandibular third molar position as a risk factor for pericoronitis. Materials and Methods: The present study was conducted on 145 subjects of both genders. The clinical symptoms and signs such as redness, pus discharge, pain, and tenderness over pericoronal flap were assessed. All candidates were subjected to CBCT scan evaluation for a third molar position such as vertical, mesioangular, distoangular, and horizontal type. Results: Maximum number of cases of pericoronitis was observed in the age group 18–28 years (80) followed by 28–38 years seen in 47 cases, and 38–48 years seen in 28 cases. The most common type of impaction was mesioangular seen in 48 females and 42 males, followed by vertical in 22 females and 18 males, distoangular in 8 females and 10 males and horizontal in 2 females and 5 males. Maximum clinical features of swelling, trismus, dysphagia, and enlarged lymph nodes were seen in patients with mesioangular impaction followed by vertical impaction. Conclusion: Maximum number of pericoronitis cases was seen in the age group 18–28 years and most commonly mesioangular impactions were observed with pericoronitis.

Keywords: CBCT, mandibular third molar, mesioangular impaction, pericoronitis

Introduction

The mandibular third molar is commonest impacted permanent teeth. It is a frequently encountered problem. The frequency of mandibular third molar impaction increases with decrease in arch space. It has been observed that 9.5 to 39% of mandibular third molars fail to erupt in the oral cavity. Pericoronitis is a painful condition which is inflammation of pericoronal flap covering the partially erupted teeth. It is commonly seen with mandibular third molar. Due to complication of pericoronitis, it is advisable to go for removal of the third molar. Patient with partial impaction may have complaints such as mild, low-grade pain to sharp or throbbing pain, redness and swelling, fever, lymphadenopathy, and halitosis.

Mandibular molar impactions are usually mesioangular, distoangular, vertical, and horizontal. Amongst all, mesioangular impaction is common and occurs in 70% of cases. The position and type of impaction may affect the development of pericoronitis. Radiographically the exact
location and status of impaction can be judged. Cone-beam computed tomography (CBCT) provides three-dimensional images of information in assessing the position and status of the tooth to perform disimpaction without developing complications. The present study was conducted to evaluate mandibular third molar position as a risk factor for pericoronitis.

Materials and Methods

The present study was conducted in the department of Oral and Maxillofacial Surgery. It comprised of 145 subjects of both genders. Written consent was obtained from participants. Ethical clearance was obtained from the institutional ethical committee.

Patients with age range 18–48 years, partially erupted the third molar, and radiographic evidence of impaction was included in the study. Patients with denied approval and poor quality images were excluded from the study.

Clinical conditions such as redness, pus discharge, pain and tenderness over pericoronal flap were assessed. All participants subjected to CBCT in all three-plane scan taken with Planmica machine operating at 120 kVp, 15 mA, and 18 s. The angulation of mandibular third molar with the long axis of the second molar was calculated and classified into vertical (10°), mesioangular (+11°–70°), distoangular (−11°–70°), and horizontal (>70°). All images were obtained and read by two independent radiologists to overcome bias [Figures 1-4]. Poor quality images with streaks errors were excluded.

Results thus obtained were subjected to statistical analysis using the SPSS statistical software (SPSS) version 20.0. Independent t-test and Chi-square test were used to determine the significant association between the two variables. P value < 0.05 was considered significant.

Results

Table 1 shows that out of 155 patients, females were 80 and males were 75. Table 2 shows that maximum number of cases of pericoronitis was observed in age group 18–28 years with females comprising of 45 and males 35 followed by 28–38 years seen in 47 cases (females- 22, males- 25), and 38–48 years seen in 28 cases (females-13, males- 15). The result was statistically significant at P < 0.05.

Table 3, Graph 1 shows that most common type of impaction was mesioangular seen in 48 females and 42 males, followed by vertical in 22 females and 18 males, distoangular in 8 females and 10 males and horizontal in 2 females and 5 males. The result was statistically significant at P < 0.05. Graph 2 shows that impinging maxillary third molar was seen in 62 cases in females and 55 in males causing pericoronitis while it was absent in 18 females and 20 males. The difference was significant statistically (P < 0.05). Table 4 shows that maximum clinical features of swelling, trismus, dysphagia, and enlarged lymph nodes were seen in patients with mesioangular impaction followed by vertical impaction. The difference was statistically significant at P < 0.05.

Discussion

Pericoronitis is a painful inflammatory condition associated with unerupted mandibular third molar. Its occurrence is more with the third molar due to its failure to erupt in the oral cavity in most of the cases and insufficient space. Patients

Figure 1: CBCT image showing mesioangular impacted 48

Figure 2: Axial images showing impacted 48

Figure 3: CBCT image showing horizontal impacted 48

Figure 4: Image showing vertical impaction 48
with pericoronitis experience pain, discomfort, swelling, pus discharge, lymphadenopathy, dysphagia, systemic upset, and serious complications.[7]

Species of bacteria such as Peptostreptococcus, Fusobacterium, and Bacteroides are frequently associated with pericoronitis. Maxillary third molar may cause trauma to tissue overlying mandibular third molar and has also been suggested as an etiologic factor.[8]

We found that impaction and pericoronitis were seen mostly in females as compared to males. The reason behind this could be because of their jaws that stop growing when the third molars just begin to erupt, in contrary to males in whom the growth of the jaws continues beyond the time of eruption of third molars. Kay[9] found that female’s prevalence is mostly seen in pregnancy cases and hence the number is seen mostly in females. He found 105 pregnant patients from a total of 117 experienced pericoronitis during the second trimester.

We found a maximum number of pericoronitis cases in the age group 18–28 years with males comprising of 45 and females 35. Our findings agree with the results of Shin et al.[10] who assessed pathoses associated with mandibular third molars subjected to removal. They found that age group 20–29 years exhibited a maximum number of pathoses associated with a lower third molar and long-term exposure to irritants from the oral cavity.

Our results are inconsistency with the results of Murad et al.[11] In contrast to our results, Singh et al. observed that pericoronitis is common in the age group of 26 pathoses 35 years and is more commonly reported in the female gender, distoangular has the highest association with pericoronitis.[12]

Thapa et al.[13] found the presence of an opposing impinging maxillary tooth molar as a risk factor for acute pericoronitis. Kay[9] found pericoronitis even in the absence of a traumatizing antagonist.

Galvão et al. concluded that vertically impacted molar is commonly associated with pericoronitis.[14] Operculectomy, as well as removal of an impacted third mandibular molar, is advisable to prevent further complications.[13] We observed that maximum clinical features of swelling, trismus, dysphagia, and enlarged lymph nodes were seen in patients with mesioangular impaction followed by vertical impaction. The common symptoms such as swelling, trismus, and difficulty in swallowing were mostly seen in patients.

Table 1: Distribution of patients

| Gender   | Females | Males |
|----------|---------|-------|
| Number   | 80      | 75    |

Table 2: Age-wise distribution of cases

| Age groups (years) | Females | Males | P  |
|--------------------|---------|-------|----|
| 18-28              | 45 (56.2%) | 35 (43.7%) | 0.01 |
| 28-38              | 22 (27.5%) | 25 (31.2%) |    |
| 38-48              | 13 (16.2%) | 15 (18.7%) |    |
| Total              | 80 (100%)  | 75 (100%)  |    |

Table 3: Type of impaction and occurrence of pericoronitis

| Type of impaction   | Females | Percentage | Males | Percentage | P  |
|---------------------|---------|------------|-------|------------|----|
| Vertical            | 22      | 27.5       | 18    | 24         | 0.05 |
| Mesioangular        | 48      | 60         | 42    | 56         |    |
| Distoangular        | 8       | 10         | 10    | 13.3       |    |
| Horizontal          | 2       | 2.5        | 5     | 6.6        |    |

Table 4: Presence of clinical features and type of impaction

| Features            | Vertical | Mesioangular | Distoangular | Horizontal | P  |
|---------------------|----------|--------------|--------------|------------|----|
| Swelling            | 32       | 78           | 12           | 2          | 0.01 |
| Trismus             | 26       | 76           | 10           | 3          | 0.02 |
| Dysphagia           | 24       | 52           | 8            | 2          | 0.01 |
| Enlarged lymph nodes| 28       | 48           | 7            | 3          | 0.05 |

Graph 1: Type of impaction and occurrence of pericoronitis

Graph 2: Presence of impinging maxillary third molar and presence of pericoronitis
CBCT gives the highest quality as well as three-dimensional single images. It offers fewer patients radiation exposure as compared to CT scan.

CBCT is a noninvasive procedure used for evaluation of impacted third molar position which could be the cause for possible pericoronitis. It could help in the practice of primary care for patient education and early intervention and case management.

The limitation of the study is the smaller size of the sample. Inclusion of large sample size could have been proved useful. Moreover, factors such as distal surface caries in mandibular second molar and seasonal variation could have been included.

Conclusion
Mandibular third molar impaction is a common pathology encountered in young age groups. A maximum number of pericoronitis cases impactions in the age group 18–28 years and most commonly mesioangular impaction were observed.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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