Correlation of Pericoronitis and the Status of Eruption of Mandibular Third Molar: A Clinico-radiographic Study

AP Indira, Mahesh Kumar, Maria Priscilla David, Vaishali Mysore Rajshekar, Shashikala

ABSTRACT

Objective: The purpose of this study was to analyze the relationship between the status of eruption of mandibular third molar and pericoronitis.

Materials and methods: The sample consisted of 50 patients inclusive of both the genders with pericoronitis. After clinical examination, radiographic assessment was done by taking OPG to assess the mandibular third molar position. Radiographic assessment was done to analyze the angulations, height and encapsulation of the mandibular third molar affected by pericoronitis following Pell and Gregory and Winter's classification. Comparison of the data was done between type of impaction and pericoronitis.

Results: In our study, among the sample of 50 patients with pericoronitis, 43 (86%) cases of mandibular third molars were partially erupted and seven (14%) cases were impacted. There was an increased prevalence of position IA (42%) followed by IIB (34%) and IIA (20%) was observed. Vertical and distoangular impaction was slightly more prevalent when compared to other types.

Conclusion: The status of impacted third molar may be correlated to the development of pericoronial infection process and their potential complications. Partially erupted, position IA, vertical and distoangular impactions can be advised for prophylactic removal, particularly to prevent surgical risks and patients morbidity with age.

Keywords: Mandibular third molar, Impaction, Pericoronitis.


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Conflict of interest: None

INTRODUCTION

In human dentition, the third molar has the highest impaction rate among all teeth.1 Although impacted third molars may remain symptom free indefinitely, they usually produce local, regional or systemic alterations of variable severity. The most frequent problem being pericoronitis.2 Pericoronitis is an infection of the soft tissue around the crown of a partially impacted tooth and is the most common pathological condition involving third molars that are most commonly found among young individuals between 18 and 24 years.3,4 This is by far the most common acute problem in third molars.

Previous studies have shown that the teeth at greatest risk in relation to acute pericoronitis are vertically erupted mandibular third molars in contact with adjacent second molar, at or above the occlusal plane and partially covered by soft or hard tissue.5

Treatment of pericoronitis runs from very conservative to slightly radical therapy.1 If removal is postponed, there may be surgical risk and morbidity increases with patient’s age. Removal of tooth may prevent the fear of infection spread, which may result in severe complications. With the above knowledge, the purpose of the study is to explore the relationship between the position of mandibular third molar and pericoronitis which in turn can be applied in preventing complications in high-risk groups.

MATERIALS AND METHODS

The study group consisted of 50 patients between age group of 18 and 34 years of both the genders with symptoms of pericoronitis who reported to the department of oral medicine and radiology, MR Ambedkar Dental College and Hospital, Bengaluru.

The patients were clinically examined after obtaining an informed consent. Radiographic assessment was done by taking orthopantomograph to assess the mandibular third molar status, following radiation protection protocol using the Kodak-8000C digital cephalometric system. The selected cases were examined clinically to assess the presence or absence of teeth and encapsulation. According to their clinical status, the unerupted teeth were divided into two groups:

1. Completely unerupted mandibular third molars, i.e. teeth that had not perforated the oral mucosa.
2. Partially erupted mandibular third molars, i.e. teeth that had perforated the mucosa and were partially visible in oral cavity.

The captured image was assessed and traced for the status and angulation of mandibular third molar by using Windows Trophy Dicom and Master view 3 software (Figs 1 and 2). The Pell and Gregory classification2 (see Fig. 1) was used to assess the ramus (horizontal) and occlusal (vertical) position of mandibular third molar in relation to anterior border of ramus and distal aspect of second molar. Winter’s classification2 was used to assess angulation of mandibular third molar in relation to long axis of mandibular second and third molar.

Inclusion Criteria

- Patients with age 18 years and above.
- Those patients presenting with clinical symptoms-associated with impacted mandibular third molars.
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Exclusion Criteria

- Patients under 18 years of age.
- Patients with a congenital disorder, cysts and tumors associated with mandibular third molar.
- Asymptomatic patients with impacted mandibular third molar.

RESULTS

In the present study, in the total sample of 50 patients with pericoronitis, 43 (86%) were partially erupted and seven (14%) were impacted (Table 1 and Graph 1). According to the Pell and Gregory’s classification of impacted third molars, the increased prevalence of position IA (42%) was observed followed by IIB (34%) and IIA (20%) (Table 2 and Graph 2). According to Winter’s classification, vertical and distoangular impaction was more when compared to other types (Table 2 and Graph 3). In relation to the side pericoronitis was observed slightly more on right side in 27 (54%) cases (see Table 1).

DISCUSSION

Pericoronitis is the inflammation of the gingiva in relation to the crown of an incompletely erupted third molar. It is the most common pathological condition involving third molars that is most commonly found among young individuals between 18 and 24 years.\textsuperscript{3,4,6} The term impaction was defined by Peterson as one that fails to erupt into the dental arch within the expected time. The average age for the eruption of mandibular third molars in male is approximately 3 to 6 months ahead of females. Pericoronitis can develop from the moment that the crown of an erupting third molar comes into contact with the oral cavity. Once the process has developed, it tends to become chronic and recur intermittently until the tooth is fully erupted or
Table 1: Eruption status of mandibular third molars

<table>
<thead>
<tr>
<th>Status of mandibular third molar</th>
<th>Number of cases with percentage</th>
<th>Status of mandibular third molar in relation to side in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partially erupted</td>
<td>43 (86%)</td>
<td>23 (46%) Left (54%)</td>
</tr>
<tr>
<td>Impacted</td>
<td>7 (14%)</td>
<td>4 (8%) Right (46%)</td>
</tr>
</tbody>
</table>

Table 2: Position of the impacted third molar

<table>
<thead>
<tr>
<th>Type of classification</th>
<th>Status of third molar</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pell and Gregory classification</td>
<td>Type IA</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Type IB</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Type IC</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Type IIA</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Type IIB</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Type IIC</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Type IIIA</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Type IIIB</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Type IIIC</td>
<td>0</td>
</tr>
<tr>
<td>Winter’s classification</td>
<td>Vertical</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Mesioangular</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Distoangular</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Horizontal</td>
<td>24</td>
</tr>
</tbody>
</table>

Treated. Although impacted third molars may remain symptom-free indefinitely, they usually produce local, regional, or systemic alterations of variable severity.2 Leone et al reported that 10% of extracted mandibular third molars have previously suffered a pericoronal infectious process.5 The clinical status of an unerupted tooth can be accurately determined not only through use of radiographs but also by means of oral examination, although panoramic radiography is a standard technique that yields high-quality information about the anatomic condition of the retromolar region.7 Pell and Gregory and Winter’s classification was used in this study as it is simple, practical and easy to apply.

The causes of impacted third molars include:
- Reduced rate of growth in the length of the mandible, in which there is insufficient increase in the length of the mandible in proportion to the amount of tooth substance.
- Vertical direction of the condylar growth which is associated with insufficient resorption at the anterior ramus border.
- Backward-directed eruption of the dentition which causes a decrease in space for third molars to erupt.
- Retarded maturation of dentition is a fourth factor contributing to incomplete eruption.8

In the present study, in the total sample of 50 patients with pericoronitis, 43 (86%) cases were partially erupted and seven (14%) cases were impacted. This finding was consistent with the study conducted by Jirapun Punwutikorn et al.7 the cause being inadequate space to accommodate the erupting tooth as a result of genetic and environmental causes. When the third molar is partially erupted, there will be break in the continuity of the mucosa which is more prone for infection since it is difficult to access that area to maintain oral hygiene and trauma caused by the opposing maxillary third molar.

The mean peak age range was 21.3 years. This finding was consistent with the study of Naosherwan Anwar et al.9 The reason being the increased incidence of impacted mandibular third molar was found in this age group.

In the present study, in relation to the side pericoronitis was observed more prevalent on right side in 27 (54%) cases in comparison to the left side with 23 (46%) cases.
In the present study, according to the Pell and Gregory’s classification of impacted third molars, the increased percentage of position IA (42%) followed by IIB (34%) and IIA (20%) was observed. This finding was consistent with the study of Alcaraz et al (cited in Marqués NA). The reason could be because of the increased incidence of mandibular third molar being impacted in this position.

In this study, according to winter’s classification vertical (28%) and distoangular (28%) impaction was probably more prevalent when compared to other types. This finding was consistent with Leone,5 Knutsson K et al10 who have showed that third molars in the vertical position, or slightly distoangular with partial mucosal and bony coverage, are the presentations most likely to cause pericoronitis. This is because such positions have high frequency rate of impaction.

The risk of an acute problem was greatest for distoangular lower third molars. This may be explained by accumulation of food and the occlusal surface of a distoangular third molar slope downward distally by occlusal movements. The amount of soft tissue surrounding a distoangular third molar may be greater than with mesioangular and horizontal impaction.11

CONCLUSION

The present study explores the correlation between the pericoronitis and status of mandibular third molar. We conclude that the status of impacted third molar may be able to be correlated to the development of pericoronal infectious process and their potential complications and can be advised for prophylactic removal, particularly in position IA, vertical and distoangular impactions to prevent surgical risks and patients morbidity with age.

REFERENCES


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