INCIDENCE OF CARIES IN MANDIBULAR SECOND MOLARS DUE TO IMPACTED MANDIBULAR THIRD MOLARS – A PRELIMINARY STUDY

Dental Science

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ABSTRACT

Aims and Objectives: The present study aimed to determine the incidence of dental caries in the mandibular second molars due to different types and angulations of impacted third molars.

Materials and Method: In the present retrospective anonymous radiographic study, a large database of 290 dental pantomograms showing 501 impacted teeth were analyzed. The impaction was classified into mesioangular, horizontal, vertical, distoangular and inverted. The number of impacted teeth, angulation of the impacted tooth, and presence or absence of caries in mandibular second molar were noted. The information so received was recorded and analyzed. Statistical evaluation of the data was done and p ≤ 0.05 was considered as a statistically important (with 95% confidence interval). Chi-square test for goodness of fit was implemented to find the association among caries and mandibular last molar impaction.

Result: The mesioangular impaction was the most common impaction (27.14%) and the inverted was the least common (1.59%). The caries incidence in second molar was highest (55.59%) in mesioangular impacted teeth, followed by distoangular (24.57%). Statistical significance was seen in mesioangular (p = 0.005) and in horizontal (p = 0.00016). The other types of impactions did not show any statistical significance.

Conclusion: The mesioangular and vertical type of impactions are the most commonly occurring patterns of impacted teeth. The caries incidence is significantly higher in mesioangular and horizontal types impactions.

KEYWORDS

Impacted, Mandibular, Third molar

INTRODUCTION

An impacted dental tooth is one which fails to erupt into dental arch within the specific time. Teeth may end up as impacted once they fail to erupt or turn into their right and useful location. Impacted teeth may consequently be non-practical in use, abnormal, or pathological. The ideal quality time of the eruption of the mandibular last molar mostly varies amongst individuals. It could start at an age of sixteen or this beginning could be impeding till 18–20 years. The main reason of impacted mandibular third molars to occur is because they encompass insufficient space inside the mandible to deal with all the erupting teeth, as they are the last to erupt.

Mandibular third molars are quite regularly impacted in the maximum common enclosed teeth, pericoronitis associated with an awful oral hygiene and lesser self-cleansing habits by the subjects. The pattern of mandibular third molar impaction and the inflection of caries in mandibular second molar have been nicely pronounced in previous literature. Thus, the present research endeavour was undertaken to add recent statistics and information in this important research field.

The pattern of mandibular third molar impaction and the inflection of caries in mandibular second molar have been nicely pronounced in previous literature. The present research endeavor was performed in the outpatient branch of our institution. Its main structure constituted of a retrospective assessment of completely anonymous virtual panoramic radiographs of two hundred and ninety patients who had at least one impacted mandibular last molar present in the radiographs. A pilot study was also carried out to determine the study size. A single method was used to encompass the kind of impaction as classified by George Winter. Only the number of impacted teeth, angulation of the impacted tooth, and presence or absence of caries in mandibular second molar had been monitored from this Digital panoramic radiographic study.

MATERIALS AND METHOD

The present research endeavour was performed in the outpatient branch of our institution. Its main structure constituted of a retrospective assessment of completely anonymous virtual panoramic radiographs of two hundred and ninety patients who had at least one impacted mandibular last molar present in the radiographs. A pilot study was also carried out to determine the study size. A single method was used to encompass the kind of impaction as classified by George Winter. Only the number of impacted teeth, angulation of the impacted tooth, and presence or absence of caries in mandibular second molar had been monitored from this Digital panoramic radiographic study.

The angulation of mandibular third molar impaction and relationship among the prevalence of caries within the mandibular 2nd molars was determined in this current research. The caries was referred to as present or absent within the dental panoramic radiograph of the adjoining second molar.
The incidence of second molar caries associated with impacted teeth in this study turned out to be 47.01%. The general incidence of distal caries in 2nd mandibular molars because of impacted last molars in this study was 21.55%. The incidence of distal caries in 2nd molars, they confirmed vertical impaction to be the major cause of distal cervical caries in 2nd molar tooth. This may be correlated with the study carried out by Nunn ME et al., [14] involving 416 subjects. They said that the second molars adjacent to absent third molars were on the lowest danger for developing pathology; whereas, 2nd molars adjacent to soft tissue impacted third molars were at greatest danger.

One hassle frequently encountered at the same time as assessing the radioluency at the distal surface of 2nd molars is whether or not it is due to caries or root resorption. Even with true decision and cross examination by way of investigators, this hassle still exists. Ooze I et al., [15] performed a study in a specific population of Turkey. They used their study to assess the prevalence of elements affecting the formation of caries in second molar distal area. In their data collection, the 2nd molar distal caries was noted to be twenty percent. They opined that a sizeable reason of caries formation was due to contact point on the second molar's cemento-enamel junction, along with an increasing angle of the subject. Falcí SG et al., [16] performed a study utilizing 246 periapical radiographs to assess the affiliation between the presence of a partially erupted mandibular third molar and the dental caries within the distal part of the second molars. The occurrence of caries at the distal of the second molar in their series revealed to be 13.4%. The incidence of distal caries in 2nd mandibular molars because of impacted last molars in this study turned out to be 47.01%. The general incidence of second molar caries associated with impacted teeth in this study was 236 out of 501 teeth radiographically examined. This is as extensively high when compared to other studies. Raheem AA et al., [7,13] in our study, the most significant finding was caries in second molar adjacent to the mesioangular impacted last molar. Horizontal impaction caries was also more observed. The finding is also similar to other study results. The intensity of impacted third molar and the occlusal angulation between the impacted teeth and the occlusal floor of the second molar influences the distal caries in 2nd molar. An overall of 5% mandibular last molars are extracted due to distal cervical caries in mandibular 2nd molar tooth. This may be correlated with the study carried out by Nunn ME et al., [14] involving 416 subjects. They said that the second molars adjacent to absent third molars were on the lowest danger for developing pathology; whereas, 2nd molars adjacent to soft tissue impacted third molars were at greatest danger.

During a study in 2008, the second molar tooth decay and its sequelae was the foremost reason (63.2%) for the inframaxillary third molar extractions, followed by perennial pericoronitis (26.3%).[11] Allen et al. (2009) showed the incidence of forty two percent decay at the distal second molar which was related to partly or compact inframaxillary third molars.[12] In this research endeavour the mesioangular impaction was the maximum type seen amongst all. This is a mandibular impaction study finding, which matches with many other studies. [7,13] In our study, the most significant finding was caries in second molar adjacent to the mesioangular impacted last molar. Horizontal impaction caries was also more observed. The finding is also similar to other study results. The intensity of impacted third molar and the occlusal angulation between the impacted teeth and the occlusal floor of the second molar influences the distal caries in 2nd molar. An overall of 5% mandibular last molars are extracted due to distal cervical caries in mandibular 2nd molar tooth. This may be correlated with the study carried out by Nunn ME et al., [14] involving 416 subjects. They said that the second molars adjacent to absent third molars were on the lowest danger for developing pathology; whereas, 2nd molars adjacent to soft tissue impacted third molars were at greatest danger.

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### TABLE – 1 DISTRIBUTION OF TYPE OF IMPACTED TEETH

<table>
<thead>
<tr>
<th>TYPE OF IMPACTED TEETH (ANGULATION)</th>
<th>NUMBER</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>117</td>
<td>23.35%</td>
</tr>
<tr>
<td>Mesioangular</td>
<td>136</td>
<td>27.14%</td>
</tr>
<tr>
<td>Vertical</td>
<td>132</td>
<td>26.34%</td>
</tr>
<tr>
<td>Distoangular</td>
<td>108</td>
<td>21.55%</td>
</tr>
<tr>
<td>Inverted</td>
<td>8</td>
<td>1.59%</td>
</tr>
<tr>
<td>Total</td>
<td>501</td>
<td>100%</td>
</tr>
</tbody>
</table>

### TABLE – 2 INCIDENCE OF CARIES IN 2ND MOLAR RELATED TO TYPE OF IMPACTED 3RD MOLAR

<table>
<thead>
<tr>
<th>Type of Impacted Teeth-Angulation</th>
<th>Caries Present in 2nd Molar</th>
<th>Caries Absent in 2nd Molar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>40</td>
<td>77</td>
<td>117</td>
</tr>
<tr>
<td>Mesioangular</td>
<td>84</td>
<td>52</td>
<td>136</td>
</tr>
<tr>
<td>Vertical</td>
<td>53</td>
<td>79</td>
<td>132</td>
</tr>
<tr>
<td>Distoangular</td>
<td>50</td>
<td>58</td>
<td>108</td>
</tr>
<tr>
<td>Inverted</td>
<td>1</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

### TABLE – 3 STATISTICAL ANALYSIS OF CARIES INCIDENCE IN 2ND MOLAR.

<table>
<thead>
<tr>
<th>Type Of Impacted Teeth (angulation)</th>
<th>Chi Square Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>7.83</td>
<td>.0051</td>
</tr>
<tr>
<td>Mesioangular</td>
<td>11.73</td>
<td>.0006</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The impaction that's most often extracted is that the inframaxillary (mandibular) third molar. The investigations for its removal embrace several determinates, like the kind and degree of impaction. It eventually is of importance to assess the different types of impaction that the surgeon may face throughout the extraction procedure. Our finding on the kinds of impaction noted in the populace is comparable to a previous study in the African country of Nigeria by Oduyana et al. [10] But the results from many other global nations disagree with the impacted teeth varieties of horizontal, inverted and aberrated impaction.

One hassle frequently encountered at the same time as assessing the radioluency at the distal surface of 2nd molars is whether or not it is due to caries or root resorption. Even with true decision and cross examination by way of investigators, this hassle still exists. Ooze I et al., [15] performed a study in a specific population of Turkey. They used their study to assess the prevalence of elements affecting the formation of caries in second molar distal area. In their data collection, the 2nd molar distal caries was noted to be twenty percent. They opined that a sizeable reason of caries formation was due to contact point on the second molar's cemento-enamel junction, along with an increasing angle of the subject. Falcí SG et al., [16] performed a study utilizing 246 periapical radiographs to assess the affiliation between the presence of a partially erupted mandibular third molar and the dental caries within the distal part of the second molars. The occurrence of caries at the distal of the second molar in their series revealed to be 13.4%. The incidence of distal caries in 2nd mandibular molars because of impacted last molars in this study turned out to be 47.01%. The general incidence of second molar caries associated with impacted teeth in this study was 236 out of 501 teeth radiographically examined. This is as extensively high when compared to other studies. Raheem AA et al., [7,13] in our study, the most significant finding was caries in second molar adjacent to the mesioangular impacted last molar. Horizontal impaction caries was also more observed. The finding is also similar to other study results. The intensity of impacted third molar and the occlusal angulation between the impacted teeth and the occlusal floor of the second molar influences the distal caries in 2nd molar. An overall of 5% mandibular last molars are extracted due to distal cervical caries in mandibular 2nd molar tooth. This may be correlated with the study carried out by Nunn ME et al., [14] involving 416 subjects. They said that the second molars adjacent to absent third molars were on the lowest danger for developing pathology; whereas, 2nd molars adjacent to soft tissue impacted third molars were at greatest danger.
mandibular last molar elimination that considerably increases with age. This can be attributed to the reality that patients tend to leave out care, and as the caries advances with symptomatic aches and infection. This may result in the second molar to eventually get extracted with advancement in age. This has led to the finding that occurrence of distal caries is higher within the more youthful age.

Also, worth mentioning at this point is the truth that maximum of the sufferers in old age region possess a missing first and 2nd molar. A prospective study with long term research and a larger sample size will determine the true incidence of 2nd molar tooth due to cervical caries. Proper counselling and creating consciousness would significantly conserve the second molar. Another point noteworthy at this time is that early prophylactic removal of impacted third molars will conserve the second molars. If the impacted tooth is mesioangularly inclined, then we must undertake an immediate elimination of the impacted third molar. In another study by Srivastava et al. [20] when evaluating the incidence of caries on the mandibular 2nd molars, mesioangular impactions had substantially greater ratings than others. The outcomes recommend that the 2nd molar distal caries justifies prophylactic mandibular last molar elimination that has an angulation of 30°–70° with a contact factor on the cementoenamel. Extraction of a mesioangular last molar earlier than the improvement of distal cervical caries in the 2d molar ought to for this reason gain the dental fitness of a patient.

CONCLUSION

Since impacted third molar enamel no longer play a large function in mastication, occlusal load distribution and in maintaining occlusion, this study advocates that early prophylactic elimination of impacted third molars in case of mesioangular and horizontally impacted teeth. This research further emphasizes that caries is maximum in occurrence in mesioangular impactions, followed by horizontal impactions. Also noteworthy is that mesioangular impactions are the most commonly observed in the population.

REFERENCES: