Clinical assessment of position of impacted lower third molars and their indications for extraction

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Abstract

The purpose of this study was to assess the position of impacted lower third molars, the indications for extraction, and the post-operative complications. Records of patients who attended Misan general hospital between March 2008 and April 2009 for surgical removal of mandibular third molars.

The angulation type and depth of impaction were determined by reviewing the orthopantomograms. A total of 140 impacted teeth were surgically extracted from 132 patients (69 males, 63 females). The reasons for extraction include recurrent pericoronitis (55%) followed by caries (25%) and prophylactic purposes (20%).

Mesioangular impactions accounted for (49.29 %) and Level 1 position of impaction accounted for (65%) of extractions. 40 complications (28.57%), including persistent pain and swelling, infection, dry socket, Trismus and ulceration were reported. Persistent pain and swelling was the most common complications followed by infection.

There was no significant relationship between the angulation, level of impaction and the occurrence of complications. Mesioangular type and Level A position of impaction were the most common impaction. Although the association was not significant, high frequency of post-operative complications was observed in mesioangular, horizontal and level A position of impaction.

Keyword: Surgical extraction of impacted lower 3rd molar, lower 3rd molar impaction. Complication of extraction.

Introduction

The lower third molars are the most frequently impacted teeth in the human and surgical extraction has become one of the most common dentoalveolar surgical procedures1. Impacted lower third molars are often associated with pericoronitis, periodontitis, cystic lesions, neoplasm, and pathologic root resorption and can cause detrimental effects on adjacent tooth 2. Studies have shown that patients with retained impacted third molars are significantly more susceptible to mandibular angle fracture of the mandible. Patients with impacted lower third molar may present with pain, caries, gingivitis and oral infections2.

Studies suggest that third molars play at least some role in crowding and in severe cases, removal of the...
impacted molars could be recommended. To relieve these symptoms, lower third molars are indicated to undergo either conventional or surgical extraction\(^3\).

Many impacted lower third molars remain asymptomatic for years but are often surgically extracted to prevent development of future complications and pathologic conditions. Many dental Surgeons in Europe and America consider prophylactic extraction of fully impacted wisdom teeth as the ideal approach\(^4\). Several factors have been associated with the occurrence of complications which include age, health of patient, gender, smoking status, degree of impaction, surgeon’s experience and the surgical technique used\(^5\).

Many authors have stated that position of the impacted third molar may be associated with complications resulting from extraction\(^6\). There is no published data regarding impacted third molar position and post-operative complications among Iraqi patients. Thus this study aimed to investigate the position of impacted lower third molars, indications for surgical procedure, and the post-operative complications. The aim of this study was to assess the position of impacted lower third molars, the indications for extraction, and the post-operative complications.

**Patients and methods**

The age, gender, number of impacted lower third molar extracted, pathological conditions such as caries, pericoronitis, or cyst were recorded. The outcome of extraction was documented as presence or absence of complications which include persistent pain and swelling, surgical site infection, alveolar osteitis (dry socket), trismus and ulceration, the position of the impacted third molar was determined by OPG. The angulation of impacted third molar was recorded based on winter’s classification with reference to the angle formed between the longitudinal axes of the second and third molars. The angulation of impaction was measured using Quek et al method\(^7\). Figure 3, to classify vertical impaction (10° to -10°), mesioangular impaction (11° to 79°), horizontal impaction (80° to 100°), distoangular impaction (-11° to -79°). The depth of third molar in relation to occlusal plane (Level A, B, C) was documented according to Queck et al, \(^7\) (figure 3).

Level A: the crown is on the same level as the occlusal plane and the cemento-enamel junction lies above the alveolar bone. Level B: the crown lies between the occlusal plane and the cemento-enamel junction of the second molar and the cemento-enamel junction of the third molar lies below the border of the alveolar bone (the crown not completely embedded in bone). Level C: the tooth lies completely embedded in bone below the cemento-enamel junction of the second molar.

Descriptive statistical analysis was used in this study. The data was tabulated and displayed by frequency and percentage using statistical package SPSS Version 16.

**Results**

There were 132 patients 69 (52.28%) males and 63 (47.72%) females, age between 16 to 52 years with mean age of 24.6 years.

Most extractions were carried out in the 16 to 25 years old group where in this group 45% were females.

Recurrent pericoronitis was the most common indication for extraction affecting 55% of impacted teeth, about 25% were extracted due to caries, and 20% were extracted for prophylactic reasons.
Figure 1 illustrates the type of impaction. Mesioangular impaction was the most frequently seen (49.29%) followed by horizontal (27.14%), vertical (15%) and distoangular impaction (8.57%).

Table showed Level A as the most common position of impaction (65%) and Level C was the least common (7.86%).

Among all extractions. The complication rate was (28.57%). Persistent pain and swelling were the most common postoperative complication in mesioangular, horizontal and vertical type of impactions which were (22.5%), (12.5%) and (7.5%) respectively. Infection which accounting (20%) of total complications was observed in all types of angulations except vertical type, while trismus was documented in horizontal impaction (10%) and mesioangular impaction (7.5%). Dry socket occurred in extractions of mesioangular, vertical and horizontal type each of them accounting to (5%) (Figure 2).

With regard to the level of impaction, pain and swelling was the common complication in all positions, followed by Infection (20%), trismus (17.5%). Dry socket appeared in (15%) of extraction at Level A, (12.5%) and Level C (2.5%).

**Discussion**

The positions of impacted mandibular third molars, pre-operative pathology, and postoperative complication have been studied in various populations. studies in Nigeria showed that mesioangular type of impaction was the most frequently seen \(^8,9\). Likewise, it was also the most common type among Chinese (80%) and Korean populations (46.5%). In this study, mesioangular impaction was the most common type (50%) \(^10\).

Assessment of depth of impaction with reference to the occlusal plane of the second molar, it was found that the greatest percentage was seen in Level A (65%). In a Spanish population the predominant position was Level B \(^11\). The findings of the present study was thus in accordance with most reports that most impacted third molars were at Level A, where the position of the highest portion of third molar was at occlusal level which is Level A.

Recurrent pericoronitis was the most frequent indication for removing impacted mandibular third molars in this study. Which was agreement with Tay AB et al 2004, Assael et al 2005. This was similar with other reports \(^12,13\). On the other hand, Huang IY et al. (2008) found that caries and its squeal was the major reason of extraction, followed by pericoronitis and periodontitis \(^14\). Caries accounted for 25% removals in this study, which was the second most common indication. Considerable controversy exists regarding prophylactic removal of asymptomatic impacted molars. Some surgeons favor a conservative approach while others opted for more interventional strategies \(^15\). The prophylactic removal was justified on the basis that the risk of surgical morbidity increases with increasing age \(^16\).

Persistent pain and swelling, infection, trismus, alveolar osteitis (dry socket), ulceration, adjacent tooth injury, temporomandibular joint injury, and possible fracture of the mandible are possible post-operative complications \(^17\). In this study, persistent pain and swelling was the most common complication (42.5%), infection was developed in (20%). Other complications such as trismus, ulcerations and alveolar osteitis were observed infrequently
Although there was no significant association between post-operative complications and angulation of impacted molars, we highlighted that the third molars within a mesioangular impaction had the highest number of complications.

Likewise, Saglam A et al\(^{18}\) reported the higher rate of complications in extractions of mesioangular impacted mandibular third molars compared to the other types, they concluded that there were direct relation between the degree of impaction of extracted tooth and the incidence of complications.

On the other hand, the greatest incidence of infections observed in the extraction of third molars in vertical position\(^ {19}\).

In this study the number of impacted teeth in each position was small, hence the occurrence of post-operative complication of teeth from Level B and C were not comparable

Muhonen A et al, found that the teeth at the position of Lenel C had more complications. Deeper impaction leading to greater likelihood of tissue disturbance and longer operation times, which explained the tendency for more complications than other positions\(^ {20}\).

Conclusions

The most common indication for removing impacted mandibular third molars was recurrent pericoronitis. Mesioangular and horizontal type of impaction were most common and should be taken into consideration for high frequency of complications after extraction. Impaction depth classification of A and C are the teeth most inclined to develop complications.

References


13- Assael LA. Indications for elective therapeutic third molar removal: the
Table 1: Number and percentage of surgically extracted lower third molars according to Level of impaction and postoperative complications

<table>
<thead>
<tr>
<th>Postoperative Complications</th>
<th>Level of Impaction</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Level A</td>
<td>Level B</td>
<td>Level C</td>
<td></td>
<td>140 (100%)</td>
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<tr>
<td>Persistent Pain &amp; swelling</td>
<td>91 (65%)</td>
<td>38 (27.14%)</td>
<td>11 (7.86%)</td>
<td></td>
<td>17 (42.5%)</td>
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<tr>
<td>Infection</td>
<td>4 (10%)</td>
<td>1 (2.5%)</td>
<td>3 (7.5%)</td>
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<td>8 (20%)</td>
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<tr>
<td>Trismus</td>
<td>5 (12.5%)</td>
<td>0 (0%)</td>
<td>2 (5%)</td>
<td></td>
<td>7 (17.5%)</td>
</tr>
<tr>
<td>Dry socket</td>
<td>5 (12.5%)</td>
<td>0 (0%)</td>
<td>1 (2.5%)</td>
<td></td>
<td>6 (15%)</td>
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<tr>
<td>Ulceration</td>
<td>1 (2.5%)</td>
<td>1 (2.5%)</td>
<td>0 (0%)</td>
<td></td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Nil</td>
<td>63 (63%)</td>
<td>35 (32%)</td>
<td>2 (5%)</td>
<td></td>
<td>100 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>28 (70%)</td>
<td>3 (7.5%)</td>
<td>9 (22.5%)</td>
<td></td>
<td>40 (100%)</td>
</tr>
</tbody>
</table>

Figure 3: Angular position of impacted third molars (Queck et al, 2003)