Assessment of Impaction Pattern and Associated Symptoms for Mandibular Third Molar.
(DPT study)
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Abstract
245 patients aged 16 years and above (mean 25.86, standard deviation 5.72 years: 55.51 % were females and 44.49 % males) were seen. They presented with 358 impacted mandibular third molars. (67.88 %) impaction were seen in patients between the ages of 16 to 25 years, while (89.67 %) impaction were seen between the ages of 16 to 30 years.

Assessing the level of impaction using PELL and GREGORY classification showed that 154 (43.02 %) impaction were in position A, 135 (37.71 %) were in position B while 69 (19.27 %) were in position C. 89 of impacted teeth were in position I (24.86 %), 211 (58.94 %) were in position II, while 58 (16.20 %) were in position III.

Between 358 impacted mandibular third molars, (62.29 %) had symptoms of pain. (67.6 %) impacted teeth were associated with pathological lesions. Out of these, 50.84 % were periodontal disease and pericoronitis, 15.64 % were caries, while 1.12 % were associated with cysts.

In conclusion, the level of impaction suggests that a remarkable number of impacted mandibular third molars should be removed under general anesthesia. There is need for further studies to determine the levels of impaction, the types of anesthesia used during extraction and the outcome.

Key words: Mandibular third molars, pattern of impaction, DPT: Dental Panoramic Tomography.
Introduction

Impacted tooth was defined by Mead (Archer WH: 1966) as a tooth that is prevented from erupting into position because of malposition, lack of space, or other impediments. Other researchers mentioned that teeth may become impacted when they fail to erupt or develop into the proper functional location. Impacted teeth may therefore be non-functional, abnormal, or pathological (Waite PD, Raynolds RR: 1998), (Killy HC, Kay LW: 1978).

In 2004 Farman (Agarwal KN et al:2004) wrote that impacted teeth are those teeth that prevented from eruption due to a physical barrier within the path of eruption. Of all teeth, mandibular third molars are the most frequently impacted (Dimitroulis, 1996).

According to Elsey and Rock (Khan et al., 2006) impaction of the third molar is occurring in up to 73% of young adults in Europe. Generally, third molars have been found to erupt between the ages of 17 and 21 years(Elsey MJ, Rock WP: 2000), (Pahkala et al., 1991). Furthermore, third molar eruption time have been reported to vary with races(Elsey & Rock, 2000), (Kruger, 2001). Third molar eruption and continuous positional changes after eruption can be related not only with race but also with nature of the diet, the intensity of the use of the masticatory apparatus and possibly due to genetic background (Alling & Alling, 1993). There is a large biological variation in the development of third molars, that there are also marked differences in this development between populations of different regions, a geographical variation (Kullman et al., 1992).

Hägg and Taranger (Hägg and Taranger , 1985) found that emergence could be affected by infection or pathology, trauma, crowding, extraction, and the presence of supernumerary teeth. Impaction of third molar may cause pericoronitis, dental caries and the development of cystic lesions (Hattab et al., 1995), (Ma’aita , 2000). All these pathological conditions indicate removing of impacted teeth (Howe,1978), (TETSCH & WAGNER, 1985).

Several studies have been done on impacted mandibular third molars in developed countries, where several millions of dollars are spent annually on the management of impacted third molars (Edwards et al., 1999), (Edwards et al., 1999), (Flick , 1999), (Ogden GR et al: 1998). In fact, it is regarded as the most common oral surgery performed (Flick , 1999).

Panoramic radiography is an easy and fast technique in which the images of both arches along with their surrounding structures are studied in one view with less radiation exposure than the complete series of intra-oral radiographs (White & Pharoah , 2004).

The aim of this study therefore, is to analyze the pattern, symptoms and pathology associated with impacted mandibular third molar teeth in Babylonian.

Materials and Methods

A total of 245 patients aged 16 years and above, who presented at the Oral diagnosis clinic in college of Dentistry, University of Babylon, with impacted mandibular third molar teeth from January 2011 to April 2014, were examined clinically and radiographically.

For the purposes of this study, OPG X-rays were selected randomly which meant that not all patients included in the study had attended the Clinic for the management of impacted wisdom teeth. Therefore, patients with any of the following conditions were excluded: any trauma to the jaws that might have disrupted the dentition alignment; third molars presenting with incomplete root formation; absent
adjacent second molars, and/or the presence of congenital diseases or facial syndromes.

Digital Panoramic radiograph of each patient was taken, using certain exposure factors for each gender (male and female) according to user manual. The images were examined on the monitor for the clear representation enhancement of the resolution was done if needed then saved, the images were entered as 1024*768 pixel digital images (JPEG files) in the computer system. Then two pairs of examiners viewed the OPGs.

The level of impaction was determined using Pell and Gregory classification (Pell GJ, Gregory, 1942) (Fig.1) as follows:
* Position A: The highest portion of the impacted mandibular third molar is on a level with or above the occlusal plane.
* Position B: The highest portion of the impacted mandibular third molar is below the occlusal plane but above the cervical line of the second mandibular molar.
* Position C: The highest portion of the impacted mandibular third molar is below the cervical line of the second mandibular molar.
* Position I: None of the crown is in the ramus of the mandible.
* Position II: Less than half of the crown is in the ramus.
* Position III: More than half of the crown is in the ramus.

All assessments were done by a single examiner. Findings were recorded when both examiners agreed. The results were analyzed using simple proportions.

**Results**

There were (245) patients fit with selected criteria of the study. Their ages range from 16 to 40 years, with a mean of 25.86 and standard deviation 5.72 years. 136 (55.51 %) were females and 109 (44.49 %) males. (358) impacted mandibular third molars were seen. Detailed distribution is presented in Table 1.

A total of 243 (67.88 %) impaction were seen in patients between the ages of 16 to 25 years, while 321 (89.67 %) impaction were seen between the ages of 16 to 30 years.

Assessing the level of impaction using Pell and Gregory classification showed that 154 (43.02 %) impaction were in position A, 135 (37.71 %) were in position B while 69 (19.27 %) were in position C. 89 of impacted teeth were in position I (24.86 %), 211 (58.94 %) were in position II, while 58 (16.20 %) were in position III.

Out of the 358 impacted mandibular third molars, 223 (62.29 %) had symptoms of pain. The distribution of impacted teeth with symptoms is presented in Table 2.

Two hundred and forty two (67.6 %) impacted teeth were associated with pathology. Out of these, 182 (50.84 %) were periodontal disease, 56 (15.64 %) were caries, while 4 (1.12 %) were associated with cysts, as it presented in Table 3.

**Discussion**

The impacted mandibular third molar is most frequently extracted. The investigations for its removal include determining the type and degree of impaction so as to assess the level of difficulty during extraction.

Results obtain from this study were lower than those obtained from many developed countries, also they were different in the number of transverse, horizontal, and inverted impaction (TETSCH & WAGNER, 1985), (Morris & Jerman, 1971).

It was observed that 19.27 % and 16.20 % of the impacted mandibular third molars were in positions C and III respectively. In these positions, the crown of
impacted teeth are either completely or mostly embedded, and that suggest to avoid performance such difficult extraction under local anesthesia and its preferred to be done with general anesthesia, for the comfort of the patient.

Obviously large proportion of the impaction fall within positions B (37.71 %), and II (58.94 %), indicating that the extractions would be moderately difficult and the choice of appropriate anesthesia whether local or general, would depend on the surgeon's evaluation and the patient’s preference. These findings suggest that a remarkable number of impaction should be removed under general anesthesia.

There is therefore the need for further studies to determine if there is any relationship between the level of impaction and impacted third molars extracted under general anesthesia.

Periodontal disease and pericoronitis were the most common pathological lesions associated with impacted mandibular third molars. Next was caries, followed by cysts. These findings are similar to those presented by Obiechina in 1991(Obiechina AE: 1991), also he recorded the presence of odontoma with percentage 0.47% and squamous cell carcinoma 0.24 %, that was not seen in this study and it may assume that these lesions were incidental findings.

Punwutikorn et al (Punwutikom , et al., 1999) reported that where symptoms exist, pain was common for erupted and unerupted mandibular third molars. Our finding did not differ. However, pain was most frequent in disto-angular impaction. While 62.29 % of the impacted third molars had symptoms, 37.71 % were asymptomatic and disease free. It was widely accepted that asymptomatic, disease free mandibular third molars be extracted for prophylactic reasons(Killy &Kay, 1978), (Howe, 1978), (TETSCH & WAGNER, 1985). However, the removals of this category of third molars appear controversial.

Conclusion
The results of our study show the importance of determination third molar impaction pattern and associated lesions for dental management. According to the authors’ knowledge, this research paper is the first study joins between impaction pattern and clinical symptoms which may be associated to Babylonian people.

Our results provide that the incidence, types and level of impaction, incidence of symptoms and diseases associated with third molar impaction in developing countries are grossly inadequate for proper planning and management of impacted third molars. There is, therefore, an urgent need for a population based study in order to determine the nature of third molar impaction in Babylonian, for effectual planning.

References


Figure (1) : Pell and Gregory classification :
Table 1 : Age distribution of types of impaction

<table>
<thead>
<tr>
<th>Pattern of impaction</th>
<th>Age (years)</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16-20</td>
<td>21-25</td>
<td>26-30</td>
</tr>
<tr>
<td>Mesioangular</td>
<td>53</td>
<td>49</td>
<td>32</td>
</tr>
<tr>
<td>Vertical</td>
<td>24</td>
<td>64</td>
<td>13</td>
</tr>
<tr>
<td>Horizontal</td>
<td>12</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>Distoangular</td>
<td>06</td>
<td>09</td>
<td>04</td>
</tr>
<tr>
<td>Inverted</td>
<td>00</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>95</td>
<td>148</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 2 : Distribution of impactions with symptom of pain

<table>
<thead>
<tr>
<th>Types of impaction</th>
<th>No. of impaction (%)</th>
<th>No. of Impaction with symptom of pain</th>
<th>Percentage of symptomatic impaction %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesioangular</td>
<td>151</td>
<td>108</td>
<td>71.52%</td>
</tr>
<tr>
<td>Vertical</td>
<td>104</td>
<td>58</td>
<td>55.77%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>81</td>
<td>40</td>
<td>49.38%</td>
</tr>
<tr>
<td>Distoangular</td>
<td>20</td>
<td>16</td>
<td>80%</td>
</tr>
<tr>
<td>Inverted</td>
<td>2</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>358</td>
<td>223</td>
<td>62.29%</td>
</tr>
</tbody>
</table>

Table 3: Distribution of pathology with impaction.

<table>
<thead>
<tr>
<th>Pathological lesions</th>
<th>No. of lesions</th>
<th>Percentage of lesions</th>
<th>Percentage to total no. of impactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periodontal diseases</td>
<td>182</td>
<td>75.21%</td>
<td>50.84%</td>
</tr>
<tr>
<td>Caries</td>
<td>56</td>
<td>23.14%</td>
<td>15.64%</td>
</tr>
<tr>
<td>Cystic lesion</td>
<td>4</td>
<td>1.65%</td>
<td>1.12%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>242</td>
<td>100%</td>
<td>67.6%</td>
</tr>
</tbody>
</table>