King Saud University

The Saudi Journal for Dental Research

ORIGINAL ARTICLE

Pattern of third molar impaction in Libyan population: A retrospective radiographic study

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Abstract *Objectives:* The aim of the present study was to radiographically evaluate the pattern of third molar impaction in a sample of Libyan patients, in terms of age, gender, angulation of impaction, level of eruption and available retromolar space using panoramic radiographs. Furthermore, cross tabulation between patterns of impaction and gender\arch were evaluated for any significant difference.

Study design: This retrospective study comprised 300 orthopantomograms (OPGs) of patients attending a private dental clinic in Benghazi between 2008 and 2013. Radiographic assessment was carried out to evaluate the prevalence of impaction, angular position of impaction, level of eruption and available retromolar space. Results were analysed using Pearson's coefficient test and Student's *t*-test

Results: Among 1200 third molars reviewed, 843 (70%) were classified as impacted, of which 371 (44%) were in the maxilla and 472 (56%) were in the mandible. The most prevalent angular position was mesioangular (34.6%) followed by vertical (31.3%) and distoangular (27.7%). A significant association existed between angular position and arch ($P < 0.001$).

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Class IIA was the most common Pell and Gregory classification (38.6%). Significant association was found between the level of eruption and arch ($P < 0.001$). Bilateral impaction was more common than unilateral impaction in both arches.

Conclusion: Our study highlights mesioangular impaction as the most frequently encountered angular position. The most common level of eruption was Level B; and the majority of impacted third molars (72.7%) had less than adequate space for eruption.

1. Introduction

Tooth impaction is a pathological condition in which a tooth fails to erupt to the normal functional position within the expected time; due to lack of space, or physical barriers.[1] Third molar is the most commonly impacted tooth in the oral cavity and accounts for 98% of all impactions.[2] The frequency of third molar impaction varies substantially among different populations; and was reported to range from 18% to 70%.[3–7] This can be attributed to racial variation in the pattern of facial growth and jaw and tooth size, which are crucial determinants of the eruption pattern.[2]

The removal of impacted third molars is one of the most common procedures performed in the speciality of oral and maxillofacial surgery,[8] since these teeth are often associated with pathological conditions including pericoronitis, periodontitis, cystic lesions or root resorption.[9]

Third molar extraction can be performed using elevators and/or forceps, or may require a surgical intervention. The latter is associated with increased risk of postoperative complications such as alveolar osteitis (dry socket), haemorrhage, nerve injuries, or in rare occasions, a fracture of the mandible.[10] However, the majority of these problems can be anticipated preoperatively with adequate clinical examination and dental radiographs. Panoramic radiograph (OPG) is considered the technique of choice to evaluate the status of impacted third molars. It is used to assess the angular position of impaction, level of impaction and amount of covering bone. In addition, panoramic radiograph is a reliable tool to evaluate the relationship between inferior alveolar canal and third molars.[11]

The aim of the present study was to radiographically evaluate the pattern of third molar impaction in a sample of Libyan patients, in terms of age, gender, angulation of impaction, level of eruption and available retromolar space using panoramic radiographs. Furthermore, cross tabulation between patterns of impaction and gender\arch were evaluated for any significant difference.

2. Materials and methods

This study was undertaken on a group of patients attending a private dental clinic in Benghazi between 2008 and 2013. A total of 300 OPGs comprising 1200 third molar were selected for evaluation. The age range of subjects was 20–54 years. Records of the following cases were excluded from the study:

1. Incomplete root development.
2. Presence of bone pathology that disrupts the alignment of teeth in the occlusal plane.
3. Absence of adjacent second molar.

4. Incomplete patient record or poor quality OPG.

The data required for each patient were collected retrospectively from their records. Due to the nature of the study (retrospective radiographic study), informed consent could not be obtained from the patients. Radiographic assessment and tracing were carried out on digital panoramic radiographs. All OPGs were reviewed by a single examiner and were assessed for the following: number of impacted third molars; angular position of impaction; level of eruption and available retromolar space.

The third molar was considered impacted when its complete eruption to the assumed functional position in the occlusal plane was prevented or disrupted regardless of the cause of impaction. The following definitions were used for assessment:

2.1. Angular position

The angulation of impacted third molars was assessed by tracing the panoramic radiographs according to winter's classification[11] (for mandibular third molars) and modified Archer's classification[12] (for maxillary third molars). Two lines were drawn, passing through the midpoint on the occlusal surface and the bifurcation area of the second and third molars. The angle formed by the intersection of these lines was measured; the following angular classification was adopted to avoid errors arising from visual impression:

Vertical impaction: 10° to −10°
Mesioangular impaction: 11° to 79°
Horizontal impaction: 80° to 100°
Distoangular impaction: −11° to −79°
Other: 111° to −80°

2.2. Buccolingual impaction

A positive degree indicated an intersection located above the occlusal plane, while a negative degree indicated an intersection located below the occlusal plane.

Level of eruption: was recorded according to Pell and Gregory classification[13] as the relationship between the occlusal surface of third molar and the cementoenamel junction of the adjacent second molar as follows:

Position A: the highest position of impacted third molar was on the same level or above the occlusal plane of the adjacent second molar.

Position B: the highest position of the impacted third molar was located below the occlusal plane but above the cervical line of the adjacent second molar.

Position C: the highest position of the impacted third molar was below the cervical line of the adjacent second molar.