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Prevalence of Third Molar Impaction and its Relationship with Age

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ABSTRACT

Purpose: The aim of this study was to determine the prevalence of impacted third molars among patients attending the Center for Alnawjed Clinic and Aesthetics in Zawia, Libya, and to evaluate the relationship between third molar impaction and age.

Materials and Methods: The study was conducted a 3-years period, between January 2017 and December 2019. Patients' files with orthopantomographs were considered for evaluation. The inclusion criteria for this study were the records of patients with orthopantomographs and above the age of 17years, patients with no history of trauma, and patients with no syndromes and/or no systemic disorders. The ages were categorized into three intervals, 17 - 20; 21 – 30; 31 - 40; 41 – 50, and 51 - 55 years old.

Results: 977 patients visited Center for Alnawjed clinic and Aesthetics, Zawia, Libya between January 2017 and December 2019, 170 patients (17.40%) met the inclusion criteria. The majority of impactions (37.6%) were mesioangular, followed by vertical impactions (26.5%), and horizontal ones (27.6%).

Conclusion: The study was carried out over the course of three years; a longer period probably would provide a clearer picture of the issue with impacted molar teeth. The predominance of affected third molar teeth in a populace of patients from Zawia city is 17.40%. The most common type of impaction was a meso-angular one, followed by horizontal, vertical, distal, transverse, and inverted angulations. *(Open J Biomed Res 2024;3:3-8.)*

Keywords

Impacted, mandibular, third molars, classifications and extraction.

AUDIOABSTRACT

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INTRODUCTION

Impaction is the term used to describe a tooth's inability to fully erupt into a proper functional position within a reasonable amount of time due to a lack of room in the dental arch, obstruction by another tooth, or abnormal development.[1]

The process of a tooth erupting is complicated and poorly understood.[2,3] It is made up of a number of biological and physical processes that take place concurrently with the development of the jaws.[3] Both regional and systemic influences play a role in this complex process[1,4] Because it is the last permanent tooth to emerge into the oral cavity, the third molar is the tooth that suffers from impacted teeth the most commonly.[2]

The two main causes of impaction are the inability of a permanent tooth to erupt or the presence of a barrier preventing its eruption.[5] Tooth impaction can be caused by both local and systemic factors. The size and position of the adjacent teeth, the presence of dense bone covering the tooth, the prolonged path of eruption, and the insufficient length of the dental arch are all local considerations. Malnutrition, hereditary conditions, and particular dietary practices are indications of systemic factors.[6] When a tooth is unable to erupt or when a barrier prevents the tooth from erupting, permanent teeth become impaction.[7]

Impacted third molars can vary in depth, position relative to the jaw, and angle with respect to the occlusal plane. Given that a few examples of impacted third molars are associated with a higher chance of caries in the contiguous tooth, information regarding these examples is clinically significant pain, pericoronitis.[8,9] Additionally, it has been shown that the kind of the third molar impaction affects how difficult it is to remove surgically and the event of postoperative

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confusions.[10-12] As a result, the mandibular third molars' depth of impaction, position in relation to the mandibular ramus, and angle can be utilized to assess the difficulty of their surgical extraction and create the best treatment strategy with the least chance of complications.[10] Previous studies have revealed that different populations have varied patterns of mandibular third molar impaction.[13]

The aim of the present study is to describe the pattern of mandibular third molar impaction and to define the most appropriate age for prophylactic extraction of mandibular third molar teeth, and to investigate the prevalent types of impacted mandibular third molar teeth, and to determine the prevalence of missing and impacted mandibular third molars in people in patients residing in Zawia, Libya.

MATERIALS AND METHODS

A retrospective study based on patient files with impacted teeth who presented at Center for Anawjed Dentistry Research and Aesthetics, Zawia, West Libya. The study was conducted a 3-year period, between January 2017 and December 2019. Patients' files with orthopantomographs were considered for evaluation.

The records of patients with orthopantomography, older than 17 years, without previous trauma, without any conditions, and without any foundational problems served as the consideration models for this study. The ages were divided into five groups, 17-20; 21-30; 31-40; 41-50; and between the ages of 51 and 55, which was comparable to the age ranges chosen in previous studies. Patients under the age of 17 and those without orthopantomograph radiographs met the exclusion criteria. A standard radiograph viewing box was used to examine the orthopantomographs to determine the kind and extent of impactions. The Impactions angulation was assessed using Quek's16 adaptation of the Winter's classification 17 (Fig. 1), which incorporated the use of an orthodontic protractor to quantify the angulation to reduce the errors associated with the evaluation by visual impression alone as follows: Mesioangular, Horizontal angulation, distal angulation, vertical angulation, Buccolingual/Transverse angulation, Inverted angulation (Fig. 2).

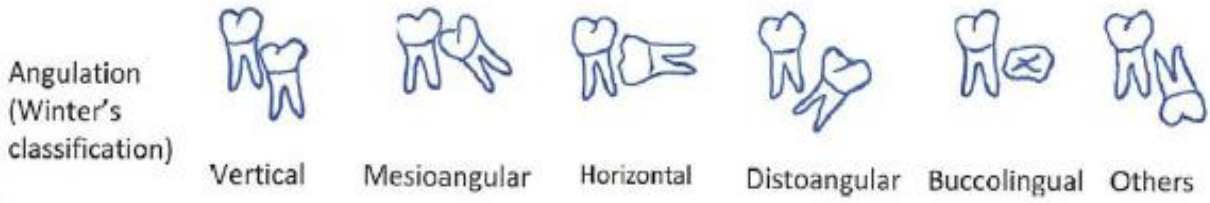


Fig. 1: The Winter classification for impacted third molar angulation.

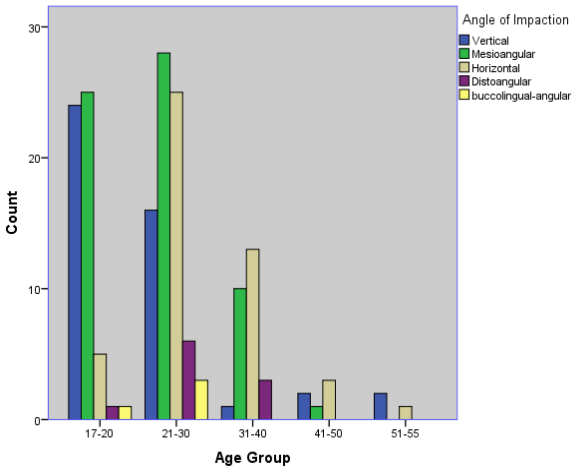


Fig. 2: The Winter classification for impacted third molar angulation.

The third molars in the mandible were examined on the radiographs to see if they were impacted on either the right or left side or on both. These data are permanent and will continue to be accurate because they were created using orthopantomographs, which were utilized to locate the third mandibular molar impactions. The methodology was devised to determine the prevalence of impactions among the greater Zawia population, and to determine if impaction is related to age and Gander.

Data were statistically analyzed by using IBM Statistical Package for Social Science (SPSS), Version 21.0 (SPSS, Chicago, IL, USA). Pearson Chi-Square calculated the association between the third molar impaction conditions to the age group and one way – ANOVA test were used for multiple comparisons between the groups. A p-value of <0.05 was considered statistically significant.

RESULTS

Between January 2017 and December 2019, 977 patients in all visited the Center for Alnawjed Clinic and Aesthetics in Zawia, Libya, 170 patients in all (17.40%) met the inclusion requirements. The average age was 28.1 years, and the standard deviation was 5.8 years. The age varied from 17 to 55 years (Table 1).

Table 1: Basic statistics for Patients (N=977).

		Frequency	Valid Percent	Cumulative Percent
Valid	Impaction	170	17.40	17.40
	Other kink of third molar condition	807	82.60	100
	% Count of Total	977	100	

Table 2: Impaction Side (Unilateral – Bilateral).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unilateral	69	40.6	40.6	40.6
	Bilateral	101	59.4	59.4	100
	Total	170	100	100	

The sample consisted of 170 impacted lower third molar teeth, with an average age between 21 and 30 years (45.9%) and 101 bilateral and 69 unilateral impactions. Mesioangular impacts made up the majority of impacts (37.6%), followed by vertical impacts (26.5%) and horizontal impacts (27.6%) (Table 2 and Table 3).

Table 3: Oral hygiene practices and behavioral factors related to tooth wear.

			Angle of Impaction					
			Vertical	Mesio-angular	Horizontal	Disto-angular	Buccolingual-angular	Total
Age Group	17-20	Count	24	25	5	1	1	56
		% of total	14.1%	14.7%	2.9%	0.6%	0.6%	32.9%
	21-30	Count	16	28	25	6	3	78
		% of total	9.4%	16.5%	14.7%	3.5%	1.8%	45.9%
	31-40	Count	1	10	13	3	0	27
		% of total	0.6%	5.9%	7.6%	1.8%	0.0%	15.9%
	41-50	Count	2	1	3	0	0	6
		% of total	1.2%	0.6%	1.8%	0.0%	0.0%	3.5%
	51-55	Count	2	0	1	0	0	3
		% of total	1.2%	0.0%	0.6%	0.0%	0.0%	1.8%
Total		Count	45	64	47	10	4	170
		% of total	26.5%	37.6%	27.6%	5.9%	2.4%	100.0%

Furthermore, the findings indicated that the studies of associations between third molar impaction conditions and age group when calculated by Pearson Chi-Square Test revealed that A p-value of 0.05 (p=0.004) and p-value in one way - ANOVA test was 0.000, So by collecting the samples and comparing them with the control value, statistically significant differences were found as shown in Table 4.

Table 4: Chi-Square and One-Way ANOVA Tests.

	Number of valid cases	Value	Sig. (2-tailed)
Pearson Chi-Square	170	34.924[a]	0.004
One way-Anova	170	-	0.000

DISCUSSION

Third molar impaction is a common aberration that may be associated with certain diseases or conditions and the results of the surgery.[8,11,13] Impaction patterns vary from population to population. As a result, the impaction patterns of mandibular third molars in Zawia, West Libya, were examined in this study.

In young adults, impacted mandibular third molars are common. As the patients' ages increase, so does the number of impacted third molars, as demonstrated by the current study. The study also demonstrated that patients between the ages of 21 and 30 presented with impacted mandibular third molars more frequently. This finding was concurred with study which found that patients between the ages of 21 and 30 had the most impactions, and teeth that appeared impacted at 18 may have as much as 30 to 50 percent of erupting fully, with the exception of horizontally impacted molars[18]. The age range that is most likely to exhibit significant lower third molar movement is represented by the selected group of ages (18 to 26).[19]

Additionally, the study showed that the mesio-angular position and kind of impaction are the most common (37.6% each). There is no discernible difference in the impaction angulation distributions on the right and left sides. Impaction angulation distributions between males and females do not differ considerably. This is analogous to those who reported

that between 18 and 32 percent of patients experienced third molar impaction.[16] The most common type of impaction in the mandibular third molars of African Americans, Singaporeans, Americans, Arabians, and Iranians was mesioangular impaction.[20-22] In this study, distal-angular alignment was the second most common impaction (27.6%). Goyal et al[23] reported the same pattern of individual impactor prevalence. In addition, 700 people participated in the study, with 40.7% having affecting mandibular third molars, 53.89 percent of the teeth in the mesial-angular position, and 20.56 percent in the distal-angular position. Al-Anqudi et al[13] presented the same pattern of individual impactor prevalence. The vertical position is the second most prevalent impaction in the literature. The tiny inclination that the crown of the impacted tooth deviates from the long axis of the second molar is misinterpreted by the publications' authors as vertical alignment, which may account for the inconsistent findings on the incidence of vertical and distal-angular impaction.[24-25]

According to studies conducted in Nigeria, the most prevalent type of impaction was the mesioangular variety.[26] In addition, it was the most common type in the Chinese (80%) and Korean (46.5%) populations. Out of 680 impacted molar extractions performed in Thailand, 402 had mesioangular impacted teeth.[27] Similar results were found in a Spanish study that mesioangular was the most common type of impaction (71.5 percent).[28] However, another study in Barcelona found that vertical angulation was the most common type of impaction (47.9 percent) and mesioangular was about 20.5 percent. Likewise presumed that mesioangular impaction was the most often seen (52.3%), trailed by even (26.4%), vertical (12.2%), and distoangular impaction (9.1%).[29] The study disagreed with findings that mandibular third molars were vertical (46%), horizontal (34%), mesial (19.5%), and distal (0.5%) in their studies.[30]

In this study, 17.4% of mandibular third molars were impacted. This is comparable to that third molar impaction occurred in 18% to 32% of patients.[16] According to this distribution of impaction by gender and age, impactions tend to increase gradually between the ages of 21 and 30, and their frequency decreases with age, with the exception of females between the ages of 31 and 40, who experience an increase in impactions.

The first attempt to estimate the Saudi population's prevalence of impacted third molars. They estimated the prevalence at the time to be 32.3% using a sample of 1000 patients from the central region of Saudi Arabia. Hassan[20] then attempted the same thing again with a sample of 1039 patients from the western region of Saudi Arabia and found a prevalence of 40.6%.[31]

Syed KB et al[15] published another prevalence report using a sample of 3800 patients from the Asir region of Saudi Arabia and estimated the prevalence at 18.76%. The retrospective nature of this study was one of its limitations. Patients' complaints about their third molars being impacted could not be evaluated because only radiographs of the patients were examined. Second, despite the detailed sample analysis, there was no sample calculation.

To ensure that the population is accurately represented, we recommend that additional research be carried out on the entire city of Zawia in West Libya. Before recommending an extraction to a patient, all dentists should also refer back to evidence-based guidelines.

CONCLUSION

The study was carried out over the course of three years; A longer time frame probably would provide a clearer picture of the issue with impacted molar teeth. The predominance of affected third molar teeth in a populace of patients from Zawia city is 17.40%. The most common type of impaction was a meso-angular one, followed by horizontal, vertical, distal, transverse, and inverted angulations.

In this study, older adults (those older than 20 years) were more likely to experience vertical impaction of lower third molars. When compared to younger patients, many radiographic readings in patients older than 20 years are in favor of eruption, such as the angulations of the lower third molar teeth and the increase in retromolar space.

By correlating the type and depth of the impaction with age and sex, the results can also be used to determine whether the patient has a predisposition for third molar impaction, which typically occurs between the ages of 18 and 24.

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