

## The Prevalence of Mesioangular Impacted Lower Third Molar Among Patients Attending the Polyclinic, Faculty of Dentistry, IIUM

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### Abstract

Tooth impaction is failure of a tooth to erupt into its normal functioning positions within the expected time. It is a condition in which the unerupted or partially erupted tooth is positioned against another tooth, bone, or soft tissue so that complete eruption is unlikely.<sup>1</sup> To study the prevalence of mesioangular impacted mandibular third molar using Orthopantomograph (OPG) among patients attending Polyclinic, Faculty of Dentistry, IIUM Kuantan Campus. A cross sectional retrospective study on Orthopantomographic radiographs which were taken from April 2009 until April 2012. OPGs with impacted mandibular third molar were collected and classified according to Winter's classification; and the angulation measured by Padhye, M. N. et al. (2003) method using Planmeca Romexis software. Then, the position of the mesioangular impaction was further classified using Pell and Gregory classification. Among total 1177 cases of impacted mandibular third molar, 38.1% cases were mesioangular impaction, 34.3% cases were vertical impaction, 18.4% cases were horizontal impaction and 9.3% cases were distoangular impaction. Out of 448 OPGs with mesioangular impaction, 244 were female patients and 204 were male patients. Mesioangular impaction was mostly seen in 20-30 age group. Among the 448 cases of mesioangular impaction, race distribution were 91.9% Malay, 4.7% Chinese and 3.4% from other races. In term of Pell and Gregory classification, Class IA, IB, IC, IIA, IIB, IIC, IIIA, IIIB and IIIC were 28.1%, 7.4%, 2.2%, 17.4%, 29%, 6%, 3.8%, 2.5%, 3.6% respectively. There was no significant difference in gender and race ( $p > 0.05$ ). The study indicated that the proportion of mesioangular mandibular third molar impaction was the highest among other types of impaction. Among the mesioangular impaction, Class IIB was the highest followed by IA, IIA, IB, IIC, IIIA, IIIC, IIIB, and IC. Although age influence was seen significantly among different classes of mesioangular impaction, no racial and gender influence was found.

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### Introduction

The tooth is impacted when it fails to erupt into its normal functioning positions within the expected time. It is a condition in which the unerupted or partially erupted tooth is positioned against another tooth, bone, or soft tissue so that complete eruption is unlikely. The most common impacted teeth are maxillary and mandibular third

molars, followed by the maxillary canines and mandibular premolars. The maxillary & mandibular third molars are the most frequently impacted, because they are the last teeth to erupt, therefore they are most likely to have inadequate space for eruption.

The lower third molar is highly concerned as it is the most frequently impacted tooth compared to other tooth,<sup>2</sup> with a frequency of occurrence reported to be from 18 to 32%.<sup>1</sup> A surgical extraction has become one of the commonest dentoalveolar surgeries.<sup>3</sup> Third molars should be removed when they are associated with various pathological conditions such as pericoronitis, periodontitis, cystic lesions, neoplasm, pathologic root resorption.<sup>4</sup>

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The impacted lower third molar (IL3rdM) can be classified based on nature of the overlying tissue impaction, angulation, relationships between tooth and anterior ramus and relation with occlusal plane. Most studies have reported no gender predilection in Caucasian, Negro, Arab and Chinese population. Other studies however, reported a higher frequency in female Caucasians. Some studies also divided as to whether the mesioangular or vertical impaction is more common.<sup>1</sup>

Classification system for lower third molar impaction is important and helpful in predicting surgical difficulty of their removal. The first classification is based on the nature of the overlying tissue, impaction which can be classified into soft tissue impaction and hard tissue impaction. The soft tissue impaction is when the height of the tooth's contour is above the level of the surrounding alveolar bone and the superficial portion of the tooth is covered only by soft (though this can be dense and fibrous) tissue. Soft tissue impaction is usually the easiest of type of impacted tooth to remove. For hard tissue ('bony') impaction; it is where the tooth fails to erupt due to being obstructed by the overlying bone. This can be subdivided into partial and complete bony impactions. In partial bony impaction, the superficial portion of the tooth is covered only by soft tissue but the height of the tooth's contour is below the level of the surrounding alveolar bone. Apart from cutting the gingiva and possible bone removal from behind the tooth, the tooth's roots may need to be divided. Meanwhile, in complete bony impaction; the tooth is completely encased in bone so that when the gingiva is cut and reflected back, the tooth is not seen. Large amounts of bone have to be removed together with root sectioning will be needed to remove the tooth incomplete, which is the most difficult tooth to remove.

The second classification is Winter's classification (1926). This classification is based on the angulation of the long axis of the impacted tooth in relation to the long axis of the second molar. This allows the description of mesioangular, distoangular, vertical, horizontal impactions by working out the possibility of the direction and degree of obliquity of the impacted tooth.<sup>5</sup> The mesioangular, the impacted tooth is tilted toward the 2nd molar in a mesial direction. It is the most commonly seen with approximately 43% of all impacted teeth and it is generally

acknowledged as the least difficult impaction to remove. The second most impacted angulation is vertical which accounts for approximately 38% and it is third position in difficulty for removal. The angulation of the vertical impaction is when the long axis of the 3rd molar is parallel to the long axis of the 2nd molar. In the distoangular impaction, the long axis of the 3rd molar is angled distally or posteriorly away from the 2nd molar. It is occurred uncommonly which only accounts approximately 6% and it is the most difficult tooth to remove. Finally, the horizontal impaction is when the long axis of the 3rd molar is horizontal or it is severe mesial inclination. It is the less common impaction and only seen approximately 3% of all mandibular impaction.

## Materials and Methods

A retrospective cross-sectional descriptive study, of three years duration, OPGs were collected at Radiology Unit, Faculty of Dentistry IIUM Kuantan. The collected samples include a orthopantomograph for patients Dentulous, both sexes, adults, aged between 20-50 patients, and of completed root tooth. OPGs with any pathology or developmental defect were excluded from the study.

The study was conducted at the outpatient clinic X-ray unit polyclinic, Faculty of Dentistry IIUM from April 2009 until April 2012.

Using good quality OPGs with the presence of the third molar impaction, the angulations of the third molar was determined by computer with Planmeca Romexis software (Planmeca Promax 3D (SN: TPX355234) and the Planmeca Romexis 2.1.1.R version of digital x-ray).

The collected samples were classified into 4 classes by using Winter's classification. Then, the mesioangular impaction was further classified by using Pell & Gregory into Class I, II, III and Class A, B or C. SPSS package version 20.0 have been used for data entry and analysis. X<sup>2</sup> test was used to test the hypothesis.

## Results

### Demographic findings

From table1, there were 1177 cases of impacted mandibular third molar. Among them, 532 cases males and 645 cases females

population. 976 cases were 20-30 age group, 155 cases 31-40 age group and 46 cases 41-50 age group. Based on the results achieved from 1177 radiographs, 91.9% of Malay patients, 4.7% of Chinese patients and 3.4% of others patients were observed to have lower third molar tooth impaction, among total 2722 OPGs taken from April 2009 until April 2012, 1177 cases of impacted mandibular third molar.

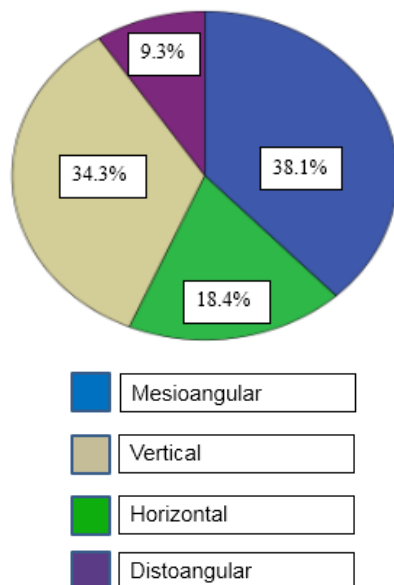
1. Gender

Gender	Number of Cases
Male	532
Female	645
Total	1177

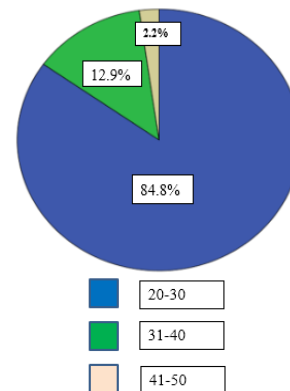
2. Age

Age	Cases Number of Cases
20-30	976
31-40	155
41-50	46
Total	1177

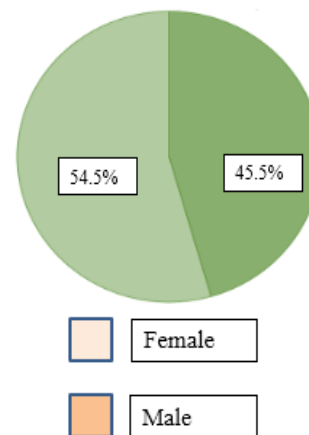
**Table 1.** Shows the Demographic Findings According to the Gender and Age.



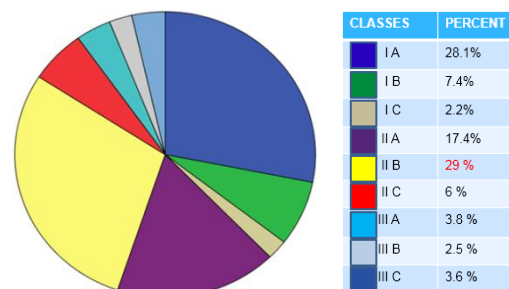
**Figure 1.** Pie chart shows the distribution of the types of impaction, 38.1% (448 cases) mesioangular, 34.3% vertical impaction, 18.4% horizontal impaction and, 9.3% distoangular impaction.



**Figure 2.** Pie chart shows the mesioangular impaction according to the age of the patients, there were 84.8% of (380 cases) age group 20-30, 12.9% of (58 cases) age group 31-40 and only 2.2% which is (10 cases) age group 41 until 50.



**Figure 3.** The pie chart above shows the mesioangular impaction in relation to the gender, we found that 54.5% which is (244 cases) are female and 45.5% which is (204 cases) are male.



**Figure 4.** The figure above shows the pie chart of the mesioangular impaction according to Pell and Gregory classification, the results showed that class II B have the highest prevalence which carried 29%, followed by class I A 28%, II A 17.4%, I B 7.4%, II C 6%, III A 3.8%, III C 3.6%, III B 2.5% and the least is class I C which is only 2.2%.

CLASSES		1A	1B	1C	2A	2B	2C	3A	3B	3C	Total	
Gender	Count	52	12	7	44	56	11	11	5	5	203	
	Male	% gender	25.6%	5.9%	3.4%	21.7%	27.6%	5.4%	5.4%	2.5%	2.5%	100.0%
		% class	41.3%	36.4%	70.0%	56.4%	43.4%	40.7%	64.7%	45.5%	31.2%	45.4%
	Female	Count	74	21	3	34	73	16	6	6	11	244
		% gender	30.3%	8.6%	1.2%	13.9%	29.9%	6.6%	2.5%	2.5%	4.5%	100.0%
		% class	58.7%	63.6%	30.0%	43.6%	56.6%	59.3%	35.3%	54.5%	68.8%	54.6%
Total	Count	126	33	10	78	129	27	17	11	16	447	
	% with regard to Gender	28.2%	7.4%	2.2%	17.4%	28.9%	6.0%	3.8%	2.5%	3.6%	100.0%	
	%with regard to Class	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

P= 0.13 Not significant  $\chi^2=12.5$

**Table 2.** Shows Classes according to the gender of the patient. The 'p' value is equal to 0.13, the classes is statically not significant to the gender of the patient.

CLASSES		1A	1B	1C	2A	2B	2C	3A	3B	3C	Total
20-30	Count	97	26	7	65	122	25	13	11	14	380
	% Age	25.5%	6.8%	1.8%	17.1%	32.1%	6.6%	3.4%	2.9%	3.7%	100.0%
31-40	Count	27	6	2	9	7	2	4	0	1	58
	% Age	46.6%	10.3%	3.4%	15.5%	12.1%	3.4%	6.9%	0.0%	1.7%	100.0%
41-50	Count	2	1	1	4	1	0	0	0	1	10
	% Age	20.0%	10%	10%	40%	10.0%	0.0%	0.0%	0.0%	10.0%	100.0%
Total	Count	126	33	10	78	130	27	17	11	16	448
	% Age	28.1%	7.4%	2.2%	17.4%	29.0%	6.0%	3.8%	2.5%	3.6%	100.0%

P= 0.014 Not significant  $\chi^2=30.8$

**Table 3.** This table shows the classes according to the age of the patient. The 'p' value is equal to 0.014, the classes are statically significant to the gender of the patient.

## Discussion

This study is done to determine the proportion of mesioangular impaction among patients attending IIUM dental clinic by assessing the panoramic radiographs. The parameters used in this work were age, gender and race in relation to the mesioangular impacted lower third molar teeth and the pattern of the mesioangular impaction.

With regard to the type of impaction the current study showed that the mesioangular impaction is the highest among other types of impaction with percentage of 38.1% which comes in agreement with previous studies which showed that mesioangular type of impaction was

the most frequently seen Omani, Iranian, Chinese, Nigerian, Korean, Thai, Eriterian, Indian, and Malaysian population.<sup>6,7</sup>

In contrast to the current findings, other researchers showed that vertical impaction was the most common in Saudi, Spanish and Jordanian population.<sup>8-10</sup>

Current study have shown that there was no sex predilection, this comes in contrast with other studies which have shown that female are more affected by impaction Ruchi 2016,<sup>11,12</sup> while some other studies showed that male are more affected in indian population.<sup>13-15</sup>

In this study We found that the highest age group is the 20-30 years old Which comes similar to previous studies done by Bayoumi AM,

et al 2016<sup>14</sup> and Ruchi Mitra 2016.<sup>16</sup> Patel S et al. 2017<sup>17</sup> showed that among Indian sample the highest number of patients were found in 15 – 30 years of age group which is similar to this study.

Assessment of width and depth of impaction with reference to the ascending ramus and occlusal plane of the second molar, among the current study showed that the greatest percentage was seen in Class IIB (29%). A study done by Jaffar et al (2009) on Malaysian sample concluded that, the predominant position was Class IIA which was 45.7%.<sup>6</sup> In a Spanish population the predominant position was Class IIB.<sup>17</sup> Among Nigerians, Obiechina et al. (2001) identified that the commonest position was Class A (31.9%) and Class II position (60.8%).<sup>18</sup> Monaco et al. (2004) reported a similar finding where the highest percentage of impacted molar position fell on Class A (56.2%) and Class II (63%) among Italians.<sup>19</sup> The findings of the present study was thus in accordance with most reports that most impacted lower third molars were at Class II position, where half of the crown was in the ramus and the position of the portion of third molar was at cervical level which is Class B.

### Conclusion

The study indicated that the proportion of mesioangular type of impaction among the patients is high compared to other types, like horizontal, vertical and distoangular. The age group that commonly has third molar impaction is between the ages of 20 – 30 years old. Although age influences were seen significantly among mesioangular impaction, no gender influence was seen. This study shows that female group experienced more third molar impaction than the male group. The Malay race is the highest group that has third molar impaction. Among the mesioangular impaction, Class IIB was the common classes of impacted mandibular third molar followed by IA, IIA, IB, IIC, IIIA, IIIC, IIIB, and IC. Results of current study give an idea on expected type of impaction of the population and the level of difficulty.

### Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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