

# Impact of Mesioangular Mandibular Impacted 3<sup>rd</sup> Molar on Peridental Health of Adjacent Tooth

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## ABSTRACT

**Objective:** The aim of this study is to determine the impact of mesioangular mandibular 3rd molar impaction on periodontal health of adjacent tooth in patients.

**Study Design:** Retrospective/observational study

**Place and Duration:** Department of Oral & Maxillofacial Surgery, MMDC Multan, during from Oct 2020 to September 2021. **Methods:** Total of seventy patients of both genders was presented in this study. Detailed demographic data of enrolled cases age, sex, body mass index, symptoms and complications were recorded after taking informed written consent. All the patients had mesioangular impactions of mandibular third molars. The impaction depth, relationship with ramus, and angulation of 70 IMTMs and their association with 2nd molar distal caries and root resorption, pathological states, and closeness to the mandibular canal were assessed on panoramic radiographs. Pell and Gregory classification was used to determine position of impacted third molar. The odds ratio (OR) and 95% confidence interval (CI) of IMTM's position on the related complications (credible interval for Bayesian models). Statistical significance was defined as a two-tailed p-value 0.05. SPSS 24.0 version was used to analyze complete data.

**Results:** There were 42 (60%) males and 28 (40%) females with mean BMI 23.13±6.46 kg/m<sup>2</sup>. Most of patients 31 (44.3%) were aged between 20-35 years. Mean attachment level was 3.03±2.34 and probing depth was 3.34±3.35. Caries, pain and swelling were the most common symptoms found among cases. Distal second molar root caries 21 (30%) and pocket formation 17(24.3%) were the most common pathologies. As per histological findings periapical inflammation was majority found in 37 (52.9%) cases followed by dental follicle in 19 (27.1%) and cyst in 11 (15.7%).

**Conclusion:** In this study, we found that the impacted mandibular third molar was most linked with distal second molar root caries and the creation of a pocket between the impacted tooth and the second molar tooth. The most common pathology associated with the impacted molar was distal second molar root caries and the creation of a pocket between the affected tooth and the second molar.

**Keywords:** Mesioangular, Impacted mandibular third molar, Pathology, Complication

## INTRODUCTION

90 percent of the general population has at least one impacted third molar, while 33 percent have at least one impacted third molar. [1] Oral surgeons perform a lot of surgery on the mandibular third molar since it is so common. Various reasons for M3 surgery include cavities and their results, germination abnormalities, orthodontic issues, infection and trauma. [2,3]

Because of malposition, interference, or lack of space in the arch, it might be classified as a "impacted" tooth. The likelihood of an impacted mandibular third molar is increased because it is the final tooth in the arch to erupt. For example, pericoronitis and an increased risk of caries and periodontal disease in the neighbouring teeth may be related with the impacted mandibular third molar or may remain asymptomatic. Debate about whether or not to remove an unaffected mandibular third molar is a constant one. Third molars are routinely removed because they are viewed as a nuisance and a non-functional necessity. If the molars are impacted, the option to keep or remove them might be a difficult one. [5] Third-molar surgical extraction can put patients at risk for complications such as nerve injury, dry socket infection, neighbouring tooth damage and fracture of the jaw as well as death in rare cases. 3

Additionally, a patient's age and systemic problems may necessitate more invasive surgery in the future if the impacted third molar is not removed as soon as possible. In order to make an informed decision, a surgeon must consider the risks and benefits of various treatment options. [6,7]

It's not uncommon for patients to have issues including nerve damage and damage to neighbouring teeth after having their third molars surgically removed.[8] As an important consideration, how likely is it that a patient's mandibular second teeth will be affected by periodontitis following the excision of their third molars? [9]

This condition is uncommon, but when it does occur, the aetiology is usually due to a retained deciduous tooth or an anomaly such as an odontoma.[10] Cleidocranial dysostosis, Gardner's syndrome, Gorlin-Sedano syndrome, and Yunis-Varon syndrome are all associated with multiple impactions [11]. It has been reported that a monozygous twin had a case of impactions of main teeth, which is uncommon [12]. Acute pain can come from infections in the tissues surrounding impacted teeth, which are typically painless. Another possible cause of pain may be the pressure on the inferior alveolar nerve in particularly deep lower third molar implants. Periodontal disease and dental

caries might be exacerbated by the presence of impacted teeth. Researchers in Turkey observed that third molar mesial-distal angles were much bigger in the impacted group, whereas retromolar space was significantly smaller in the impacted group. In a study of a Hong Kong Chinese population, Chu et al. (2003) revealed that 8 percent of teeth adjacent to impacted mandibular third molars had periodontal loss greater than 5 millimetres, while 7 percent of neighbouring second molars had caries on the same surfaces.[13]30 percent of patients in Nigeria were diagnosed with impacted mandibular third molars, according to the study. Some individuals with pulpitis, pericoronitis, and periodontitis had infections that ranged in severity from mild to severe (Oginini, 2002). [14]

## MATERIAL AND METHODS

This retrospective/observational study was conducted at Department of Oral & Maxillofacial Surgery, MMDC Multan, during from Oct 2020 to September 2021 and comprised of 70 patients. Detailed demographics of enrolled cases age, sex, body mass index, symptoms and complications were recorded after taking informed written consent. Patients less than <20 years of age, previous history of trauma to the jaw involving the dentition, craniofacial anomalies and those did not give any written consent were excluded from this study.

Enrolled cases were aged between 20- 65 years of age. Based on the Pell and Gregory classification and the angulation of IMTMs according to the Winter's classification, the independent variables investigated in this study were depth of impaction, ramus angulation, and Pell and Gregory ramus angulation. The midpoint of the occlusal surface and the bifurcation of the tooth were used to calculate the longitudinal axis of mandibular molars. An orthodontic protractor was used to measure the angle formed by the longitudinal axis of the second and third molars.

As a part of this study, we looked at factors such as existence of caries, root decay, closeness to the mandibular canal, and presence of intra-bony pathological lesions associated with the IMTM. A distal radiolucency in relation to the oral environment as well as a gap between the third and second molars that caused food impaction were used to distinguish between distal caries and distal root resorption, respectively, in order to identify which was the more serious condition. Caries, pericoronitis, fracture of the tooth, disease of the follicle, including cyst/tumor, resorption and periodontitis, were among the reasons for removing the impacted mandibular 3rd molar. Angular location and related pathologies were determined using orthopantomograms of the patients considered. It was determined using Winter's categorization that the angular position of the second and third molars' intersected longitudinal axis in this study corresponds to the angle produced between those axes. As a result of this study, a variety of radiographic abnormalities were documented, including caries, radiolucent areas around the mandibular third molar, radiolucent areas around the partially-erupted and partially-impacted mandibular third teeth, and external desorption of the neighbouring tooth. SPSS 24.0 version was used to analyze complete data.

## RESULTS

There were 42 (60%) males and 28 (40%) females with mean BMI  $23.13 \pm 6.46$  kg/m<sup>2</sup>. Most of patients 31 (44.3%) were aged between 20-35 years. Mean attachment level was  $3.03 \pm 2.34$  and probing depth was  $3.34 \pm 3.35$ .(table 1)

Table 1: Characteristics of enrolled cases

Variables	Frequency	Percentage
Gender		
Male	42	60
Female	28	40
Age group (years)		
20-35	31	44.3
25-50	23	32.9
>50	16	22.9
Mean BMI (kg/m <sup>2</sup> )	$23.13 \pm 6.46$	
Mean Attachment Level	$3.03 \pm 2.34$	
Mean Probing depth	$3.34 \pm 3.35$	

We found caries 29 (41.4%), pain 24 (34.3%) and swelling 17 (24.3%) were the most common symptoms found among cases.(table 2)

Table 2: Association of symptoms among impacted mandibular 3<sup>rd</sup> molar

Variables	Frequency (70)	Percentage
Symptoms		
Caries	29	41.4
Pain	24	34.3
Swelling	17	2.3

Distal second molar root caries 21 (30%) and pocket formation 17(24.3%) were the most common pathologies.(table 3)

Table 3: Association of pathologies among cases

Variables	Frequency	Percentage
Pathologies		
Distal second molar root caries	21	30
pocket formation	17	24.3
Distal 7 root resorption	13	18.6
Distal 7 caries+Pocket	10	14.3
Distal 7 root resorption+Pocket	9	12.9

Table 4: Histological results among cases

Variables	Frequency	Percentage
Histological findings		
periapical inflammation	37	52.9
dental follicle	19	27.1
cyst	11	15.7
tumors	3	4.3

Table 5: Classification of the third molar according to Pell and grey method

Pell and Gregory classification	Frequency	Percentage
Occlusal surface		
A	29	41.4
B	35	50
C	6	8.6
Ramus		
A	32	45.7
B	36	51.4
C	2	2.9

As per histological findings periapical inflammation was majority found in 37 (52.9%) cases followed by dental follicle in 19 (27.1%) and cyst in 11 (15.7%).(table 4)

Pell and Gregory classification was used to determine position of impacted third molar.(table 5)

## DISCUSSION

When addressing impacted mandibular third molar in the adult population, the risk for developing or having chronic periodontal abnormalities on the distal aspect of the mandibular second molar should be recognised. Third molars are the last teeth to erupt in the oral cavity and this normally happens between the age of 18 to 24 years. Impaction may be associated with pathological changes including pericoronitis, a higher risk of caries and periodontal disease in adjacent teeth, and orthodontic issues in later life or remain asymptomatic. The incidence of impacted mandibular third molar ranges from 16.7 percent to 96.5 percent . [15] Despite the significant amount of material dedicated to the discussion on whether or not to prophylactically remove third molars, there is still dispute and contention among general dentistry practitioners and oral surgeons as to what constitutes best practise. [16]

In this retrospective/observational study 70 patients of both genders were presented. There were 42 (60%) males and 28 (40%) females with mean BMI 23.13±6.46 kg/m<sup>2</sup>. Most of patients 31 (44.3%) were aged between 20-35 years. Mean attachment level was 3.03±2.34 and probing depth was 3.34±3.35. Current study was comparable to the studies conducted in past.[17,18] In countries where dental checkups begin at an earlier age, impactions are more likely to be identified. [19] However, in resource-poor nations like Tanzania, most patients seek medical attention only when they are experiencing symptoms that cause them to become temporarily unable to do their daily activities, such as mild to severe pain, swellings, trismus, or fever. We found caries 29 (41.4%), pain 24 (34.3%) and swelling 17 (24.3%) were the most common symptoms found among cases.

Distal second molar root caries 21 (30%) and pocket formation 17(24.3%) were the most common pathologies. Five teeth a week exhibited decay in the distal portion of the corresponding second molar in the mesioangular teeth, according to the study. According to our estimates, a substantial number of lower second molars require root canal treatment, extraction, or restoration because of the existence of a mesioangular third molar in the lower jaw. This can have a negative impact on the patient's dental health, as well as the health service's finances. According to other studies, persons over the age of 65 are more likely to develop distal molar caries. [21] The median age of patients with distal cervical caries in the second molar is 30 and their DMFT score is approximately half the mean score for the overall population in various age groups. [22] Third molars with an angulation of 40 to 80 degrees were shown to be the most common cause for distal cervical caries. As a group, patients with a mesioangular third and distal caries in the second molar were of the same age as those without these conditions.

Increased plaque accumulation and pericoronitis have been linked to the presence of a third molar that is partially

or completely impacted by soft or hard tissue. In the current study, recurrent pericoronitis was the most common reason for surgical removal of an impacted mandibular third tooth. In the literature, researchers found similar results. [23,24] In our hospital, the initial bout of pericoronitis is not treated surgically unless it is quite severe. Third molar ectomy may be necessary if the patient experiences a second or subsequent bout of pericoronitis. In the current study, impacted third molar removal was most common in the age range of 25 to 34 years. When it comes to impacted third molar removal, males had a somewhat greater rate than females. Previous research found the same thing. [25,26]

The impaction depth (Pell and Gregory classification) and second molar distal caries were found to have a substantial connection in this study. As per histological findings periapical inflammation was majority found in 37 (52.9%) cases followed by dental follicle in 19 (27.1%) and cyst in 11 (15.7%). It was difficult to interpret early studies since the prevalence of cyst formation related with mandibular third molars was variable. Different diagnostic criteria may be to blame. There is a higher occurrence of follicular cysts in women with pericoronal radiolucency more than 2.5 mm according to Stephens et al.[27]. Cysts were defined using both radiographic and histological data. Study participants were more likely to have a mandibular third-molar cyst or tumour than previously reported [28, 29] and less likely to have an EI-Khateebet al [29] radiographic examination of impacted teeth and associated pathology (3.9 percent).

## CONCLUSION

In this study, we found that the impacted mandibular third molar was most linked with distal second molar root caries and the creation of a pocket between the impacted tooth and the second molar tooth. The most common pathology associated with the impacted molar was distal second molar root caries and the creation of a pocket between the affected tooth and the second molar.

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