

FREQUENCY OF MESIOANGULAR IMPACTED MANDIBULAR THIRD MOLAR AND COMMON PATHOLOGIES ASSOCIATED WITH IT

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ABSTRACT

Mandibular third molars being the last tooth to erupt frequently become impacted due to lack of space, hard and soft tissue obstruction and aberrant path of eruption. Mesial angulation of impacted mandibular molars is more common than other angulations. Impacted teeth can be associated with various pathologies like pericoronitis, caries, periodontal problems, root resorption and cyst and tumors. The study aims to determine the frequency of mesioangular impaction in the local population and common pathologies associated with it. This descriptive study was conducted in the department of Oral and Maxillofacial Surgery at Khyber Medical University-Institute of Dental Sciences, Kohat, from November 2017 to August 2018. A total of 410 patients, aged 18 years and above, presenting with impacted mandibular third molars were included in this study. The angulations and associated pathologies were evaluated by history, clinical and radiographic examination. Impacted teeth were more common in males (60.2%) aged 25 years and below (58.8%). The most frequent angulation was mesioangular (51%) and the common pathology associated with these mesioangular impactions was pericoronitis followed by carries. Frequency of cyst and tumors accounted for only 1 percent which does not support the prophylactic extraction of asymptomatic impacted teeth to prevent these pathologies.

Key Words: *Mesioangular, impacted mandibular third molar, associated pathologies, dental carries, pericoronitis*

INTRODUCTION

Impacted tooth is one which fails to erupt into its functioning position in the jaw within its expected time.^{1,2} Mandibular third molars more frequently become impacted due to the limited space in the mandibular arch, dense overlying hard and soft tissues, abnormal path of eruption or pathological lesions.³ The extraction of the impacted mandibular third molars (IMTM) is a common minor oral surgical procedure carried out by Oral Surgeons and the decision whether to remove or retain a mandibular third molars is perhaps the most frequent and contentious treatment decisions in dentistry because these teeth can remain

symptom free for long time. However they may give rise to various symptoms and pathologies such as pain, pericoronitis, distal caries of 2nd molar, swelling, periodontal problems, resorption of adjacent teeth and their roots, odontogenic cysts and tumors.^{4,5} Eruption status of these impacted teeth, their position, depth and angulations have an impact on these symptoms.⁴

Mandibular third molars may present with different patterns and positions that can be associated with diverse pathologies.⁵ Clinical examination and radiographs not only help to classify these teeth but also aid in the diagnosis and differentiation of various pathologies associated with them. The classification of IMTM is based on the angulation of the third molars, depth of impaction, and the relationship of these teeth to the anterior border of the ramus.⁶ Winter classified these teeth on the basis of the inclination of impacted tooth to the long axis of the adjacent second molar and hence the impacted teeth are classified into distoangular, mesioangular, horizontal and vertical. The most common one is the mesioangular impacted mandibular third molar (MIMTM).^{5,6}

In this study we will evaluate the frequency of MIMTM and the common pathologies associated with it in local population. Although a lot of studies have

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been done, locally and worldwide, on the patterns and pathologies associated with IMTMs but mesioangular impaction being the most common is ignored. No studies are previously done on MIMTM in this part of the country.

This study will highlight the common pathologies associated with MIMTMs and help the oral surgeons to evaluate and plan for the management of these pathologies when encountering mesioangular impactions.

METHODOLOGY

This descriptive cross-sectional study was done in patients presenting to the outpatient department of Oral and Maxillofacial Surgery, at KMU Institute of Dental Sciences, Kohat. It was conducted from November 2017 to September 2018 and a total of 410 patients, aged 18 years and above with IMTMs were included in this study. After obtaining approval of the ethical committee of the institution, written informed consent from the patient was taken. Detailed history and clinical examination was carried out. All the patients were advised an orthopantomogram (OPG).

Inclusion criteria include all patients aged 18 years and above, irrespective of gender, who came for the management of IMTMs associated with pathologies. Any craniofacial anomaly or syndrome such as Down syndrome, and cleidocranial dysostosis were excluded from this study.

The parameters recorded included the name, age, gender, address, the angulations of the impacted tooth (mesioangular and other angulations) and the pathology associated with mandibular impacted tooth (pericoronitis, caries of the second and third molar, periodontal problem, root resorption of second molar and cyst and tumor).

The angulation of IMTM was based on Winter's classification with reference to the angle formed between the intersected longitudinal axes of the second molar with impacted third molars and were grouped as mesioangular and other angulations (vertical, horizontal, distoangular).

The angulation and associated pathology was identified on the basis of clinical examination and radiograph (OPG). Periodontal problems were those with a probing depth of 5mm or more using a WHO periodontal probe with ball tip. A radiolucent lesion of more than 5mm around the impacted tooth was classified as cyst/tumor.

Data was analyzed in SPSS version 20. The qualitative variables in the demographic data like gender, angulations and associated pathologies were presented as proportions and percentages and quantitative variable like age was presented as means and standard deviation.

RESULTS

Among the 410 patients included in this study 247 were male (60.2%) and 163 females (39.8%) with a male to female ratio of 1.5:1.

The age of the patients ranged from 18 years to 60 years with mean age of 26 ± 6 years. The most common age group was 25 years and below ($n=241$, 58.8%) followed by 26-30 years ($n=95$, 23.2%), 31-35 years ($n=44$, 10.7%), 36-40 years ($n=14$, 3.4%), 41-45 years ($n=10$, 2.4%) and 46 years and above ($n=6$, 1.5%) age group.

Mesioangular impaction accounted for 51% ($n=209$) of all impacted mandibular molars and the remaining 49% ($n=201$) were other angulations. Out of these 209 MIMTMs, 124 (59.3%) were males and 85 (40.7%) were females. The other angulations of IMTMs were also more common in male ($n=123$, 61.2%) patients than females ($n=78$, 38.8%).

Most of the 209 MIMTMs belong to age group 25 years and below ($n=161$, 77%) followed by age group 26-30 years ($n=29$, 13.9%). The detail of distribution of angulations into age groups is given in table 1.

The most common pathology associated with mesioangular impaction was pericoronitis ($n=100$, 47.8%) while least common was cystic lesion ($n=2$, 1%). Details of the pathologies associated with different angulations are given in table 2.

All the pathologies associated with IMTM were more commonly observed in male patients and in the 25 years and below age group except carries of the 3rd molar which was common in 26-30 years age group. The distribution of associated pathologies with different age groups is shown in table 3.

DISCUSSION

The third molar teeth are the last to erupt and thus have high chance of becoming impacted. Although impacted third molars may remain symptomless for an indefinite period, they could be associated with various symptoms and pathologies. There is a general consensus on the removal of impacted tooth associated with pathologies or with clinical manifestations; however the decision regarding prophylactic removal or retention of asymptomatic impacted third molar has been a challenging and controversial one. The association between the angulation of impacted mandibular third molars and their associated pathologies has been reported by many authors.^{7,8} mesioangular impacted mandibular third molars have been found to be associated with complications more frequently.^{7,9,10}

In this study the male to female ratio was 1.5:1. Variable ratios of male to female had been reported in Pakistan and in other parts of the world. Some

TABLE 1: DISTRIBUTION OF ANGULATIONS INTO DIFFERENT AGE GROUPS

Age groups	Angulation		Total n (%)
	Mesioangular n (%)	Other angulations n (%)	
≤ 25	77.0%	39.8%	58.8%
26-30	13.9%	32.8%	23.2%
31-35	6.2%	15.4%	10.7%
36-40	1.4%	5.5%	3.4%
41-45	1.4%	3.5%	2.4%
≥ 46		3.0%	1.5%
Total	100.0%	100.0%	100.0%

TABLE 2: DISTRIBUTION OF ASSOCIATED PATHOLOGIES AMONG DIFFERENT ANGULATIONS

Associated pathologies	Angulation		Total n (%)
	Mesioangular n (%)	Other angulations n (%)	
pericoronitis	100 (47.8)	119 (59.2)	219 (53.4)
2nd molar caries	49 (23.4)	13 (6.5)	62 (15.1)
3rd molar caries	23 (11.0)	41 (20.4)	64 (15.6)
periodontal problems	29 (13.9)	9 (4.5)	38 (9.3)
root resorption (2nd molar)	6 (2.9)	18 (9.0)	24 (5.9)
cyst/tumor	2 (1.0)	1 (0.5)	3 (0.7)
Total	209	201	410

TABLE 3: DISTRIBUTION OF ASSOCIATED PATHOLOGIES INTO DIFFERENT AGE GROUPS

Agegroups	Associated pathologies						Total n=410
	Pericoro-niti n=219	2nd molar carries n=62	3rd molar carries n=64	periodon-tal prob-lems n=38	root re-sorption (2nd mo-lar) n=24	cyst/tu-morn=3	
≤ 25	74.0%	59.7%	21.9%	47.4%	33.3%	66.7%	58.8%
26-30	18.3%	22.6%	31.2%	36.8%	29.2%		23.2%
31-35	6.4%	12.9%	18.8%	7.9%	29.2%		10.7%
36-40	0.5%	3.2%	9.4%	5.3%	8.3%	33.3%	3.4%
41-45	0.5%	1.6%	12.5%				2.4%
≥ 46	0.5%		6.2%	2.6%			1.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

studies^{5,7,10-12} reported female preponderances while other studies done in Pakistan reported similar male predominance.^{13,14}

The most common age group in this study was 25 years and below while the least common was 46 years and above. All the angulations with their associated pathologies were seen more commonly in 25 years and below age group except 3rd molar caries which was common in 26 to 30 years age group. Similar results were reported in other studies done locally^{12,13} and

worldwide^{8,15}. Third molars are the final teeth to erupt into the oral cavity, typically between the ages of 18 and 24 years of age and these teeth usually become symptomatic during this time. This may also show increased dental awareness among patients in this age group. Similarly the low incidence of impacted teeth in the older age groups can be explained by the fact that with increasing age the chance of developing pathology decreases and the fact that most people have already removed or treated impacted teeth at an earlier age.

Mesioangular impaction was the most common type accounting for 51 percent of the patients included in this study which could be attributed to the fact that the mandibular third molar develops in the ramus with its occlusal surface facing upwards and forwards and as a space becomes available due to growth of the mandible, it rotates into a more upright position. This normal developmental process and eruption path of mandibular third molars may be responsible for high percentages of mesioangular impaction. Similar high incidence of mesioangular impactions were reported in other studies^{14,16}. However Hazza'a et al⁸ and Punjabi et al¹¹ reported a high frequency of vertical impaction followed by mesioangular impacted tooth. This difference can be attributed to genetics and racial and ethnic differences as well as other factors such as the degree of mastication and dietary habits of the study population.

Pericoronitis was the most common associated pathology found in relation with MIMTMs (47.8%) and other angulations (59.2%). Similar results were reported in other studies as well.^{11,17} However this is in disagreement with the studies done by Nazir et al¹⁴ and Shahzad et al⁵ who reported a high incidence of caries associated with MIMTM. Similarly Mokhtar et al¹⁶ reported 2nd molar bone loss as the most common pathology associated with MIMTM followed by carries of the 3rd molar. Hazza'a et al⁸ found increase incidence of pericoronitis associated with vertical impaction while Venta et al¹⁸ found distoangular impaction more commonly associated with pericoronitis.

The second most common pathology found in association with MIMTM was distal caries of the second molar (23.4%) while caries of the third molar itself was found in 11% cases while for other angulations the 3rd molar caries were seen in 20.4% and 2nd molar caries in 6.5% of all associated pathologies. Similar results were reported by Movahhedian et al⁷ in his study. Mokhtar et al¹⁶ found caries of the MIMTM as the second most common pathology (14%) in his study after 2nd molar bone loss (36.7%). Srivastava et al¹⁹ found that 37.5% of mandibular second molar has distal caries associated with impacted MTMs and 55% were due to MIMTM. Similarly Shahzad et al⁵ found caries of MIMTM as the most common pathology (43%) and reported 8.9% distal caries of 2nd molar associated with MIMTM. Syed et al²⁰ in his study found that 60.2% of the distal caries of the second molar is due to MIMTM. The mesial angulation of 3rd molar allows space between 2nd and 3rd molar for accumulation of plaque and calculus with sequelae of distal caries in 2nd molars. Additionally the pressure from MIMTM results in the resorption of distal crown. The high incidence of distal caries of 2nd molar may also be due to lack of oral health awareness and regular dental checkups among the local population which

results in delayed diagnosis and sequel of impacted teeth.

In this study periodontal problem accounted for 13.9% of the pathologies associated with MIMTM and 4.5% of pathologies associated with other angulations. Similar results of periodontal problems associated with MIMTM were reported by Ishfaq et al²¹ (13.4%), Nazir et al¹⁴ (14.3%) and Shahzad et al⁵ (13.37%). Punjabi et al¹¹ reported a much lower percentage (6.3%) of periodontal problems associated with MIMTM. The triangular space formed by mesioangular impaction and second molar allows for food entrapment and inaccessibility of the area to oral hygiene measures which results in bone loss and periodontal pocket formation.

The external root resorption of the second molar due to MIMTM in this study accounted for 2.9% of the patients while other angulations had root resorption in 18 (9%) cases. Ishfaq et al²¹ in his study found that 3.1% of the MIMTM cause root resorption of the second molar. Nazir et al¹⁴ (10.3%) and Shahzad et al⁵ (9.5%) reported higher percentages (10.3%) of 2nd molar root resorption due to mesioangular impaction. Oenning et al²² in their study found that both mesioangular and horizontal impacted molars resulted in significant potential for resorption of second molar. Since there is lack of space for eruption of 3rd molar, now the path of eruption is towards the distal surface of the roots and crown of the 2nd molar resulting in pressure resorption of the root.

Only 2 (1%) patients reported with cystic lesion associated with mesial angulation and 1 (0.5%) patient had cystic lesion with other angulations of IMTMs in this study. Other studies showed similar low percentage of cyst and tumors associated with IMTMs.^{14,21} The percentage of cyst and tumor associated with MIMTM found in our study is lower than that reported by Patil et al²³ (3.3%), Osborn et al²⁴ (3%), and Guven et al²⁵ (2.31%). These findings do not support the prophylactic extraction of MIMTM to prevent cyst and tumor formation.

CONCLUSION

Mandibular impacted third molars most commonly present with problems in men below the age of 25 years. Mesioangular impaction is the most common one which frequently presents with pericoronitis and dental carries of the 2nd and 3rd molars. The incidence of cyst and tumors associated with mesioangular impaction is very low and therefore their prophylactic removal to prevent these pathologies should not be carried out.

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CONTRIBUTIONS BY AUTHORS

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| 2 Atta Ur Rehman: | Discussion, Referencing, Review of the article and final approval. |
| 3 Saddique Aslam: | Study design, facilitated the data collection process. |
| 4 Numan M. Khan: | Data Collection, Referencing. |
| 5 Gulrukh Sheikh: | Results and Tabulation, Literature search, Conclusions. |