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Morphogenic and Demographic Analysis of Impacted Mandibular Third Molar -A Retrospective Study

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ABSTRACT:
The mandibular third molar is the most commonly impacted tooth followed by the maxillary canine and first permanent molars. The removal of impacted mandibular third molars is one of the most common procedures in dental surgery. The aim of the study is to retrospectively analyse the morphology and demographic data of the impacted mandibular third molar.Five hundred and twenty-three patients were included in the present study. The Mean age ranged from 14 to 65 years, with a mean age of 35.0 years. The median age of the male patients was 25.5 years and for females 22 years.

KEYWORDS : INCIDENCE, IMPACTED THIRD MOLAR, DEMOGRAPHIC

I. INTRODUCTION

An impacted tooth follows an abortive path of eruption and fails to reach a proper functional location in the mouth. The mandibular third molar is the most commonly impacted tooth followed by the maxillary canine and first permanent molars. The removal of impacted mandibular third molars is one of the most common procedures in dental surgery (Hattab et al; 1999, Knutsson et al; 1996, Venta et al; 1993).[38,33,50]

They are the most frequently impacted teeth because of their particular topography, phylogeny, and ontogeny.[44] The frequency distribution of impacted mandibular third molar differs for different parts of the world. In the developed countries, varying incidence range of 9.5-25%. Up to 50% of modern humans experience problems with their M3s, whether it is the failure of proper eruption (impaction) or absence of calcification (agenesis; Ricketts 1972; Kruger et al. 2001)[5,22,42] Thus Knowledge of the epidemiology of impaction of mandibular third molars in a society is important as it helps in identifying its prevalence and in the provision of the necessary human and material resources.[52,43,47]

Many theories have been proposed to explain the incidence of impacted mandibular third molars. The prominent among these are mendelian theory, phylogenic theory, and orthodontic theory. Most of these theories stress the discrepancy of jaw size to tooth size which further has been related to the dietary habits which vary from one region to the other. [11,28,37,51, 52]

Impacted teeth were seldom a problem for Neolithic men. Their highly abrasive diet caused attrition of teeth resulting in a reduction of the mesiodistal distance of the dentition. This allows the mesial migration of teeth and adequate space was available for the eruption of the third molars. But with the arrival of refined food and consequential reduction in the masticatory functional load, today, the rate of impaction of third molars shows a significant increase (John Hunter theory of nature and nurture)[13,21,31,32]. Mead believed that delay in eruption causes the impaction of teeth.

The third molars are the last teeth to erupt in all races despite racial variations in the eruption sequence. Racial variation in facial growth, jaw and teeth size, nature of the diet, the extent of generalized tooth attrition, degree of use of masticatory apparatus, and genetic inheritance are the crucial factors thatdetermine the eruption pattern, impaction status, and the incidence of agenesis of third molars.[Agenesis of the third molar has long been shown to have a genetic component (Garn and Lewis 1962; Vastardis 2000)[6,35,44], but it can also develop as the result of developmental pathology (Shapira et al. 2000)[16,34,49], delayed growth (Bermudez de Castro 1989), and, arguably, the amount of space available in the jaw (e.g., Kajii et al. 2004).(10)

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Few other factors that affect the prevalence and distribution of impacted teeth in different regions of the jaw include the age, timing of dental eruption, and the radiographic criteria for dental development and eruption. [33,27,46,48] The object of impaction may be soft tissue, dental hard tissue, or bone.[23]They are directly or indirectly associated with numerous disorders in the mouth, jaw, and facial regions. [14, 30]

As Mandibular third molars show the highest incidence of impaction and have been held responsible for pathoses such as pericoronitis, periodontal defects posterior to the second molars, caries in the second and third molar, neurogenic and myofascial pain, odontogenic cyst and tumors, ameloblastoma and primary or secondary crowding of dentition **[30, 39, 43]**. Early removal of these teeth prevents such problems and therefore, the extraction of third molars is one of the most common surgical procedures for Oral and Maxillofacial surgeons which is widely acknowledged.

AIM AND OBJECTIVES

The Aim of the study is to retrospectively analyze the morphology and demographic data of impacted mandibular third molar.

OBJECTIVE

1. To determine the prevalence of impacted mandibular third molars in a sub -continent population.
2. To evaluate the prevalence, incidence of agenesis of third molar impaction
3. To analyze the correlation between age group, gender as factors.
4. Indication for removal of associated impacted of third molar.
5. Site of impacted third molar: 38 or 48
6. Evaluate type of impaction based on winters classification: mesioangular, Distoangular, vertical, or horizontal
7. Radiographic assessment of impacted mandibular third molar to the inferior alveolar canal by evaluating following factors Darkening of root apex, Deflection of root, narrowing of root apex, Bifid root apex, Narrowing of the canal, Deviation of mandibular canal, Interruption of white line and No relations.
8. To find various complications associated with impacted lower third molar extraction.

II. MATERIALS AND METHOD

THE STUDY DESIGN

A retrospective study was carried out on 523 patients in the period of 1 year October 2015 to October 2016, who reported to the Department of Oral and Maxillofacial Surgery, Meenakshi Ammal Dental College & Hospital, Chennai, for the surgical removal of impacted mandibular third molars.

INCLUSION CRITERIA

The inclusion criteria for this study were the records of patients with

1. Availability of OPG or IOPA
2. Patients above the age of 14years.

EXCLUSION CRITERIA

The exclusion criteria were files for patients

1. Incomplete data
2. Below 17 years.

DATA ANALYSIS METHOD:

The records from the maxillofacial department were retrieved from the archives and were used as the source of data. From each patient file, the demographics such as gender and age, indication for removal of mandibular impacted third molar like pain, periapical infection, periodontal disease or caries in second molars, and for orthodontic or therapeutic reasons were recorded.

Standard radiographs IOPA & OPG were assessed for the presence of impacted teeth. Evaluation of the type of impactions and presence of impacted mandibular third molars in the right and left sides of the lower jaw were documented.

The difficulty index and the angulation of impacted third molar were recorded based on WINTER`s and PELL & GREGORY classification with reference to the angle formed between the longitudinal axes of the second molar and third molars.The patient's records that met the definite inclusion criteria were recorded in a data collecting sheet.

STATISTICAL ANALYSIS

A biostatistician was consulted from the beginning of the study for statistical analysis. Categorical variables (e.g. age, gender, type of impaction, associated tooth, and complications) were summarized by frequency counts and percentages. The Student t-test was used for comparisons of mean values. The comparison of the types of impaction between subgroups was performed by the Fisher Exact test. Incidence rates were expressed as percentages with 95% confidence intervals. All statistical procedures were performed on SAS software. In all statistical tests p values ≤ 0.05 were considered significant.

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III. RESULTS

Five hundred and twenty-three patients were included in the present study. Mean age ranged from 14 to 65 years, with a mean age of 35.0 years. The median age of the male patients was 25.5 years and for females 22 years. The standard deviation was 10.2.

Panoramic and intraoral radiographs of patients with impacted mandibular third molars that attended the extraction in one-year duration from September 2015 to September 2016 were assessed. In conjunction with relevant clinical data, a total of 523 impacted mandibular third molars were recorded.

DEMOGRAPHIC RESULTS

1. GENDER PREVALENCE

This study revealed that females more commonly presented with symptoms; there were 280 (53.5%) female patients and 243 (46.5%) male patients (See Table1., Fig 1).

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	243	46.5	46.5	46.5
	Female	280	53.5	53.5	100.0
	Total	523	100.0	100.0	

TABLE 1: DISTRIBUTION OF CASES AMONG THE GENDER

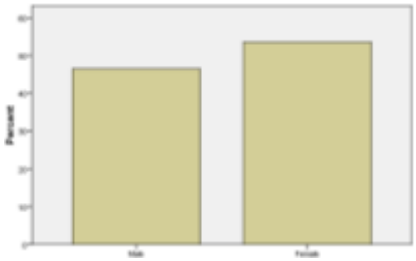

FIG 1: DISTRIBUTION OF CASES AMONG THE GENDER

2. IMPACTION AND AGE

The patient's age group range was from 14 to 66 years. Each age group has10 years. In this sample, it was found that between the age group 21 to 30 years, female patients (102 cases) were most likely to present with impactions when compared to that of males (73 cases). (Table 2, Fig 2)

Sex * Age Groups Crosstabulation

			Age Groups						
			14-20 Years	21 - 30 Years	31- 40 years	41- 50 Years	51 - 60 Years	61 - 66 Years	Total
Sex	Male	Count	8	73	85	54	19	4	243
		% within Sex	3.3%	30.0%	35.0%	22.2%	7.8%	1.6%	100.0%
		% within Age Groups	32.0%	41.7%	46.2%	55.7%	55.9%	50.0%	46.5%
	Female	Count	17	102	99	43	15	4	280
		% within Sex	6.1%	36.4%	35.4%	15.4%	5.4%	1.4%	100.0%
		% within Age Groups	68.0%	58.3%	53.8%	44.3%	44.1%	50.0%	53.5%
Total		Count	25	175	184	97	34	8	523
		% within Sex	4.8%	33.5%	35.2%	18.5%	6.5%	1.5%	100.0%
		% within Age Groups	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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TABLE 2: DISTRIBUTION OF THE CASES IN THE 6 AGE GROUPS TO THE GENDER.

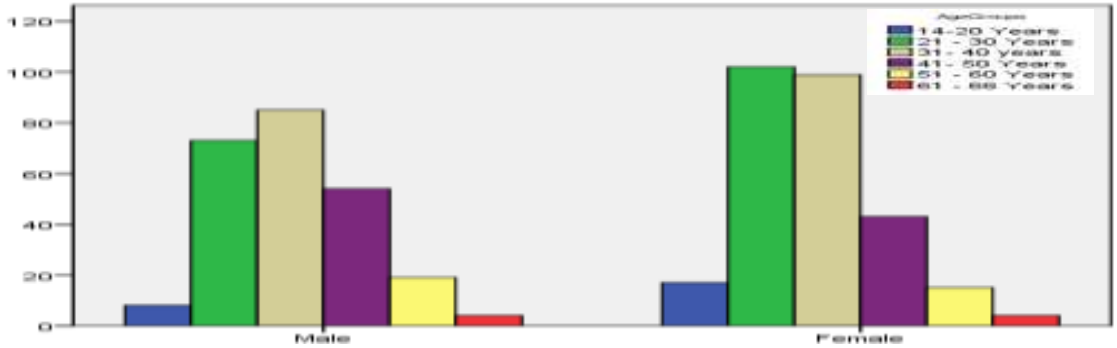

FIG 2: DISTRIBUTION OF THE CASES IN THE 6 AGE GROUPS TO THE GENDER.

3. PREVALENCE OF LOWER IMPACTED THIRD MOLAR

The prevalence of symptoms related to impaction in lower third molars on the right (48) and left (38) sides was recorded. It was found to have 255 patients (48.8%) had impaction on the right side (48) while the rest 268 (51.2 %) had on the left side (38).(Table 3, Fig 3)

Tooth Impacted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	48	255	48.8	48.8	48.8
	38	268	51.2	51.2	100.0
	Total	523	100.0	100.0	

TABLE 3: DISTRIBUTION OF LOWER IMPACTED THIRD MOLAR

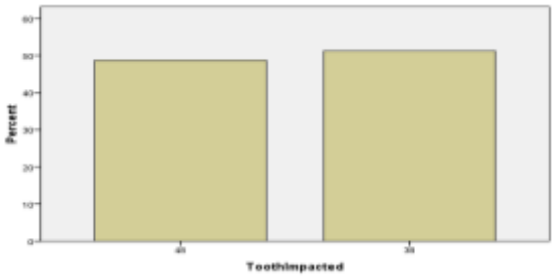

FIG 3: DISTRIBUTION OF LOWER IMPACTED THIRD MOLAR

4. INDICATION FOR THE SURGICAL REMOVAL OF LOWER IMPACTED THIRD MOLAR

Among 523 patients that reported for removal of third molars were categorized on basis of their chief complaint as pain and without pain. Patients complaining of no pain were recorded under therapeutic extraction and extraction of the third molar required for treatment in the second molar tooth. Patients complaining of pain were recorded under dental caries, pericoronitis, periapical infection, cheek bite, and cystic lesion.

Therapeutic extraction of impacted third molar was required in 113 patients (21.6 %) undergoing orthodontic treatment. For 31 (5.9 %) patients that were undergoing treatment in second mandibular molar e.g.: crown fixation, root canal procedure also required removal of the mandibular impacted third molar. 42 Patients (8.0%) have reported for extraction of lower molars with a chief complaint of chronic cheek bite that was associated with pain and inflammation in the buccal mucosa. Pericoronitis developed in 114 patients i.e. (21.8%) of reported lower third molar impactions.

Cysts or enlarged follicles as a single pathological entity developed around impacted mandibular third molars in 8 (1.5%) of the cases. Caries or resorption of impacted third molars was

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evident in 145 (27.7%) of the cases with some involving caries in the distal surface of the second molars. 70 patients (13.4%) reported periapical infections that were associated with dental caries about the impacted lower third molars. (Table 4, Fig 4)

INDICATIONNEW

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Treatment in 2nd Molar	31	5.9	5.9	5.9
	Therapeutic	113	21.6	21.6	27.5
	Dental Caries	145	27.7	27.7	55.3
	Pericoronitis	114	21.8	21.8	77.1
	Periapical Infection	70	13.4	13.4	90.4
	Cheek Bite	42	8.0	8.0	98.5
	Cyst	8	1.5	1.5	100.0
	Total	523	100.0	100.0	

TABLE 4: INDICATION FOR SURGICAL REMOVAL OF IMPACTED THIRD MOLAR

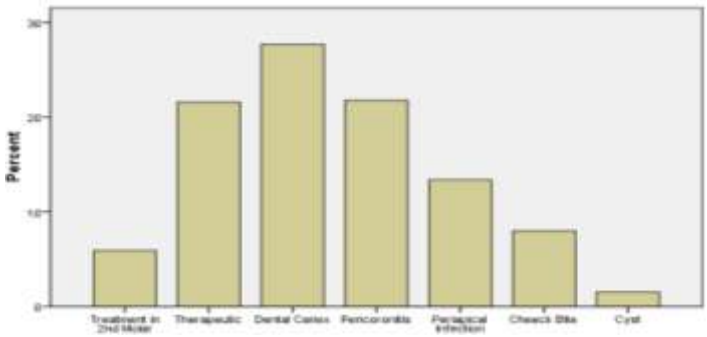

FIG 4: INDICATION FOR SURGICAL REMOVAL OF IMPACTED THIRD MOLAR

5. TYPE OF RADIOGRAPH

The radiographic evaluation of 523 patients reported for extraction of impacted third molar was done using 426 (81.5%) IOPA and 97 (18.5%) orthopantomography(Table 5, Fig 5)

TYPE OF RADIOGRAPH

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	IOPA	426	81.5	81.5	81.5
	OPG	97	18.5	18.5	100.0
	Total	523	100.0	100.0	

TABLE 5: TYPE OF RADIOGRAPH

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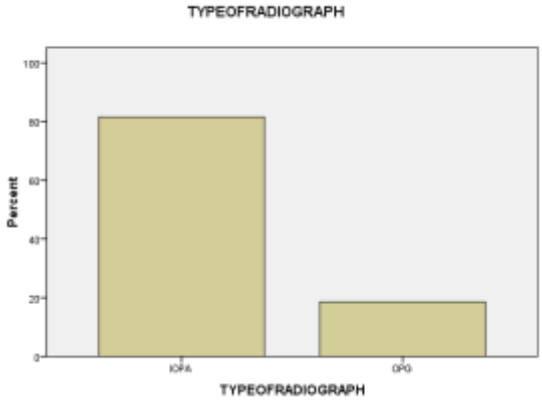

FIG 5: TYPE OF RADIOGRAPH

6. PREVALENCE OF IMPACTED MANDIBULAR THIRD MOLAR TEETH AND THEIR ANGULATION

The prevalence of symptoms related to the angle of impaction in this sample was recorded and it was found that the mesioangular inclination predominated (53.5 %), followed by the disto-angular position (21.6%), and the horizontal impaction (14.0%). The was the least common type of impaction encountered vertical inclination (10.9%).(Table 6, Fig 6)

Type of impaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mesioangular	280	53.5	53.5	53.5
	Distoangular	113	21.6	21.6	75.1
	Vertical	57	10.9	10.9	86.0
	Horizontal	73	14.0	14.0	100.0
	Total	523	100.0	100.0	

TABLE 6: TYPE OF IMPACTION

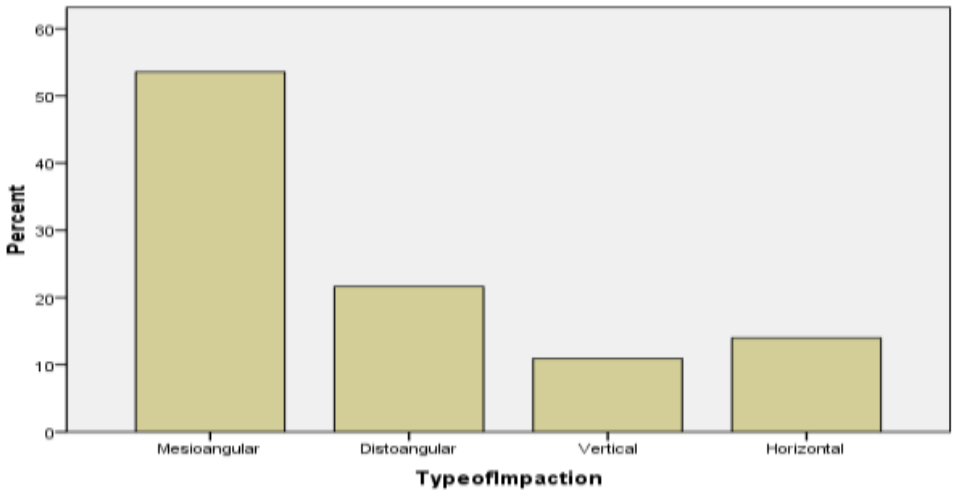

FIG 6: TYPE OF IMPACTION

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7. INVOLVEMENT OF INFERIOR ALVEOLAR NERVE TO IMPACTED MANDIBULAR THIRD MOLAR

The radiographic evaluation indicated a close relationship between the mandibular third molar tooth and the inferior alveolar canal. 64.1% showed no involvement of nerve whereas 14% depicted darkening of the root. Narrowing of the root was seen in 9.6 % and deviation of the canal in 4.0 %. 2.3% showed a deflection of the root from the canal.(Table 7, Fig 7)

INVOLVEMENT OF IAN

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No involvement	335	64.1	64.1	64.1
	Darkening of root	73	14.0	14.0	78.0
	Interruptions of the white line	32	6.1	6.1	84.1
	Deflected	12	2.3	2.3	86.4
	Narrowing of root	50	9.6	9.6	96.0
	Deviation of canal	21	4.0	4.0	100.0
	Total	523	100.0	100.0	

TABLE 7: INVOLVEMENT OF INFERIOR ALVEOLAR NERVE TO IMPACTED MANDIBULAR THIRD MOLAR

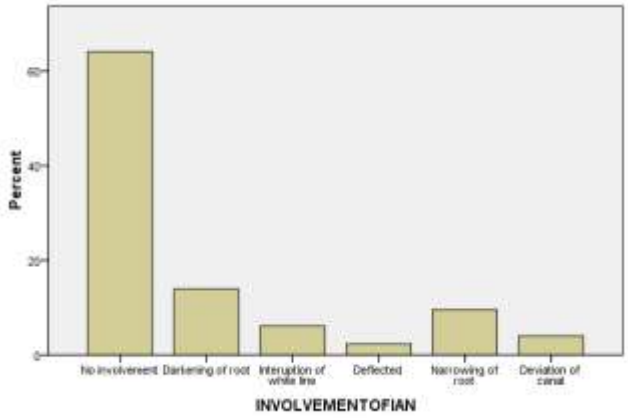

FIG 7: INVOLVEMENT OF INFERIOR ALVEOLAR NERVE TO IMPACTED MANDIBULAR THIRD MOLAR

COMPLICATION ASSOCIATED WITH IMPACTED THIRD MOLAR

462 (88.3%) patients reported no complications. Trismus was a major complication seen in 35 (6.7%) patients followed by nerve injury in 10 (1.9%) and swelling in 8 (1.5%). Bleeding and infection were seen as common in 4 (0.8%) patients.(Table 8, Fig 8)

Complication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	462	88.3	88.3	88.3
	Bleeding	4	.8	.8	89.1
	Trismus	35	6.7	6.7	95.8

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	Nerve Injury	10	1.9	1.9	97.7
	Swelling	8	1.5	1.5	99.2
	Infection	4	.8	.8	100.0
	Total	523	100.0	100.0	

TABLE 8: COMPLICATIONS ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLAR

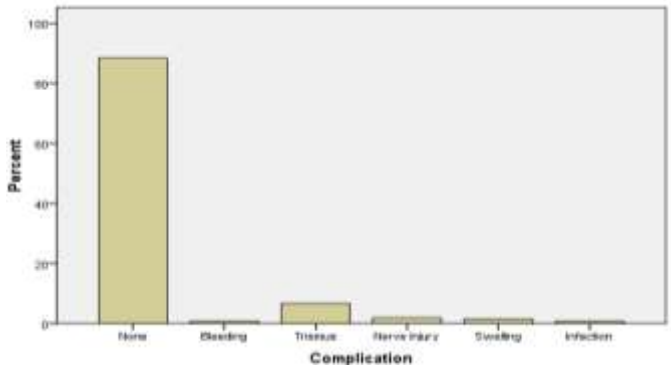

FIG 8: COMPLICATIONS ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLAR

PREVALENCE OF IMPACTED THIRD MANDIBULAR MOLAR TEETH AND THEIR ORIENTATION BY GENDER

Crosstab

			Sex		
			Male	Female	Total
Type of Impaction	Mesioangular	Count	129	151	280
		% within Type of Impaction	46.1%	53.9%	100.0%
		% within Sex	53.1%	53.9%	53.5%
	Distoangular	Count	62	51	113
		% within Type of Impaction	54.9%	45.1%	100.0%
		% within Sex	25.5%	18.2%	21.6%
	Vertical	Count	24	33	57
		% within Type of Impaction	42.1%	57.9%	100.0%
		% within Sex	9.9%	11.8%	10.9%
	Horizontal	Count	28	45	73
		% within Type of Impaction	38.4%	61.6%	100.0%
		% within Sex	11.5%	16.1%	14.0%

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Total	Count	243	280	523
	% within Type of Impaction	46.5%	53.5%	100.0%
	% within Sex	100.0%	100.0%	100.0%

TABLE 9: IMPACTED MANDIBULAR THIRD MOLAR AND GENDER

The distributions of the angulations of impaction for males and females do not differ significantly (Pearson Chi-Square, p = 0.133)(Table 9, Fig 9)

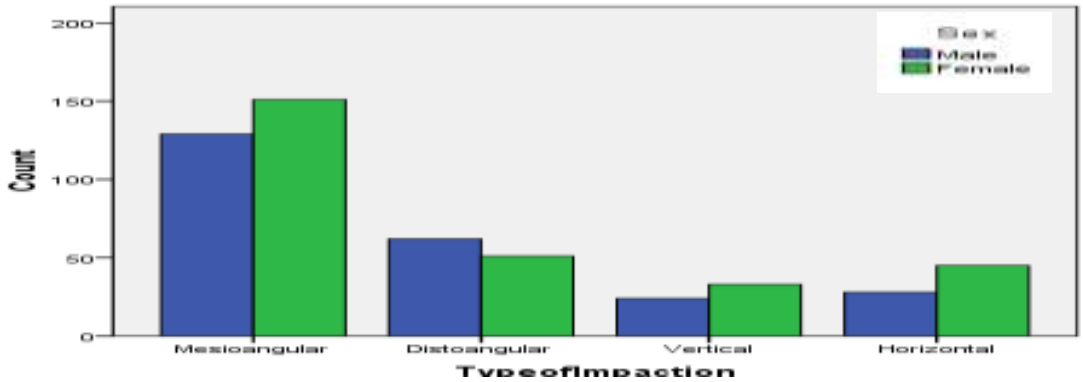

Fig 9: Impacted mandibular third molar and gender

10. PREVALENCE OF TYPE OF IMPACTION TO THE TOOTH IMPACTED

Crosstab

			Tooth Impacted		
			48	38	Total
Type of impaction	Mesioangular	Count	145	135	280
		% within Type of Impaction	51.8%	48.2%	100.0%
		% within Tooth Impacted	56.9%	50.4%	53.5%
	Distoangular	Count	59	54	113
		% within Type of Impaction	52.2%	47.8%	100.0%
		% within Tooth Impacted	23.1%	20.1%	21.6%
	Vertical	Count	25	32	57
		% within Type of Impaction	43.9%	56.1%	100.0%
		% within Tooth Impacted	9.8%	11.9%	10.9%
	Horizontal	Count	26	47	73
		% within Type of Impaction	35.6%	64.4%	100.0%
		% within Tooth Impacted	10.2%	17.5%	14.0%
Total		Count	255	268	523
		% within Type of Impaction	48.8%	51.2%	100.0%

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10. PREVALENCE OF TYPE OF IMPACTION TO THE TOOTH IMPACTED

Crosstab

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Type of impaction	Mesioangular	Count	145	135	280
		% within Type of Impaction	51.8%	48.2%	100.0%
		% within Tooth Impacted	56.9%	50.4%	53.5%
	Distoangular	Count	59	54	113
		% within Type of Impaction	52.2%	47.8%	100.0%
		% within Tooth Impacted	23.1%	20.1%	21.6%
	Vertical	Count	25	32	57
		% within Type of Impaction	43.9%	56.1%	100.0%
		% within Tooth Impacted	9.8%	11.9%	10.9%
	Horizontal	Count	26	47	73
		% within Type of Impaction	35.6%	64.4%	100.0%
		% within Tooth Impacted	10.2%	17.5%	14.0%
	Total	Count	255	268	523
		% within Type of Impaction	48.8%	51.2%	100.0%
		% within Tooth Impacted	100.0%	100.0%	100.0%

TABLE 10: IMPACTED MANDIBULAR THIRD MOLAR AND TOOTH IMPACTED

The distributions of the angulations of impaction for the tooth impacted do not differ significantly (Pearson Chi-Square, p = 0.68)(Table 10, Fig 10)

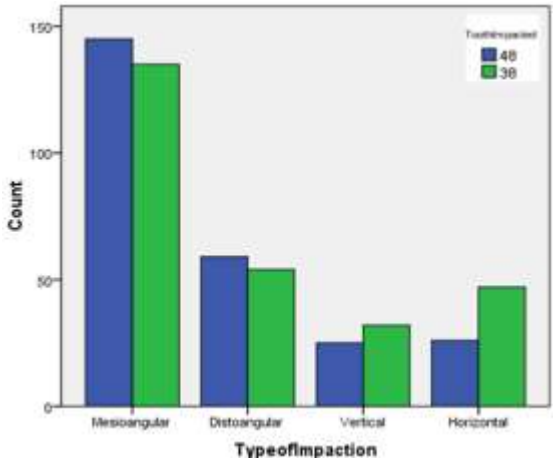

FIG 10: IMPACTED MANDIBULAR THIRD MOLAR AND TOOTH IMPACTED

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11. PREVALENCE OF TYPE OF IMPACTION TO THE INDICATION FOR EXTRACTION

Type of Impaction * Indication Cross Tabulation

			Indication New							Total
			Treatment in 2nd Molar	Therapeutic	Dental Caries	Pericoronitis	Periapical Infection	Cheek Bite	Cyst	
TypeofImpaction	Mesioangular	Count	12	62	64	70	38	31	3	280
		% within Type of Impaction	4.3%	22.1%	22.9%	25.0%	13.6%	11.1%	1.1%	100.0%
		% within Indication	38.7%	54.9%	44.1%	61.4%	54.3%	73.8%	37.5%	53.5%
	Distoangular	Count	8	23	48	17	13	3	1	113
		% within Type of Impaction	7.1%	20.4%	42.5%	15.0%	11.5%	2.7%	.9%	100.0%
		% within Indication	25.8%	20.4%	33.1%	14.9%	18.6%	7.1%	12.5%	21.6%
	Vertical	Count	6	10	11	13	10	6	1	57
		% within Type of Impaction	10.5%	17.5%	19.3%	22.8%	17.5%	10.5%	1.8%	100.0%
		% within Indication	19.4%	8.8%	7.6%	11.4%	14.3%	14.3%	12.5%	10.9%
	Horizontal	Count	5	18	22	14	9	2	3	73
		% within Type of Impaction	6.8%	24.7%	30.1%	19.2%	12.3%	2.7%	4.1%	100.0%
		% within Indication	16.1%	15.9%	15.2%	12.3%	12.9%	4.8%	37.5%	14.0%
Total		Count	31	113	145	114	70	42	8	523
		% within Type of Impaction	5.9%	21.6%	27.7%	21.8%	13.4%	8.0%	1.5%	100.0%
		% within Indication	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 11: IMPACTED MANDIBULAR THIRD MOLAR AND TOOTH ANGULATION

The distributions of the angulations of impaction for the indications for extraction is significant (Pearson Chi-Square, p = 0.68)

The mesioangular impaction being the most common type of impaction (280cases) 53.5% was significantly correlated and was associated with more pericoronitis 61.4% (70) as their indication for extraction. This was followed by dental caries

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(64 cases) 44.1% and therapeutic extraction (62 cases) 54.9%.(Table 11, Fig 11)

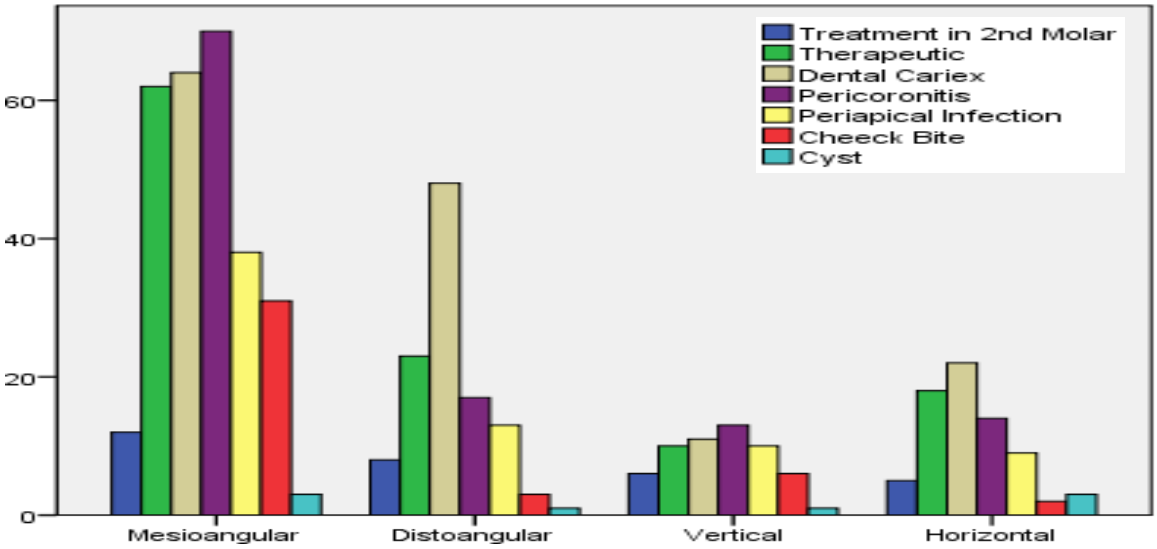

FIG 11: IMPACTED MANDIBULAR THIRD MOLAR AND TOOTH ANGULATION

12. PREVALENCE OF TYPE OF IMPACTION TO THE INVOLVEMENT OF IAN

Crosstab

			Involvement of IAN						
			No Involvement	Darkening of Root	Interruptions of the white line	Deflected	Narrowing of Root	Deviation of canal	Total
TypeofImpaction	Mesioangular	Count	171	42	19	10	26	12	280
		% within Type of Impaction	61.1%	15.0%	6.8%	3.6%	9.3%	4.3%	100.0%
		% within Involvement of IAN	51.0%	57.5%	59.4%	83.3%	52.0%	57.1%	53.5%
	Distoangular	Count	71	13	8	0	17	4	113
		% within Type of Impaction	62.8%	11.5%	7.1%	.0%	15.0%	3.5%	100.0%
		% within Involvement of IAN	21.2%	17.8%	25.0%	.0%	34.0%	19.0%	21.6%
	Vertical	Count	42	5	4	0	4	2	57
		% within Type of Impaction	73.7%	8.8%	7.0%	.0%	7.0%	3.5%	100.0%
		% within Involvement of IAN	12.5%	6.8%	12.5%	.0%	8.0%	9.5%	10.9%
	Horizontal	Count	51	13	1	2	3	3	73
		% within Type of Impaction	69.9%	17.8%	1.4%	2.7%	4.1%	4.1%	100.0%

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	% within Involvement of IAN	15.2%	17.8%	3.1%	16.7%	6.0%	14.3%	14.0%
Total	Count	335	73	32	12	50	21	523
	% within Type of Impaction	64.1%	14.0%	6.1%	2.3%	9.6%	4.0%	100.0%
	% within Involvement of IAN	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 12: IMPACTED MANDIBULAR THIRD MOLAR AND RELATIONSHIP WITH IAN

The distributions of the angulations of impaction for the tooth impacted do not differ significantly (Pearson Chi-Square, p = 0.185)(Table 12, Fig 12)

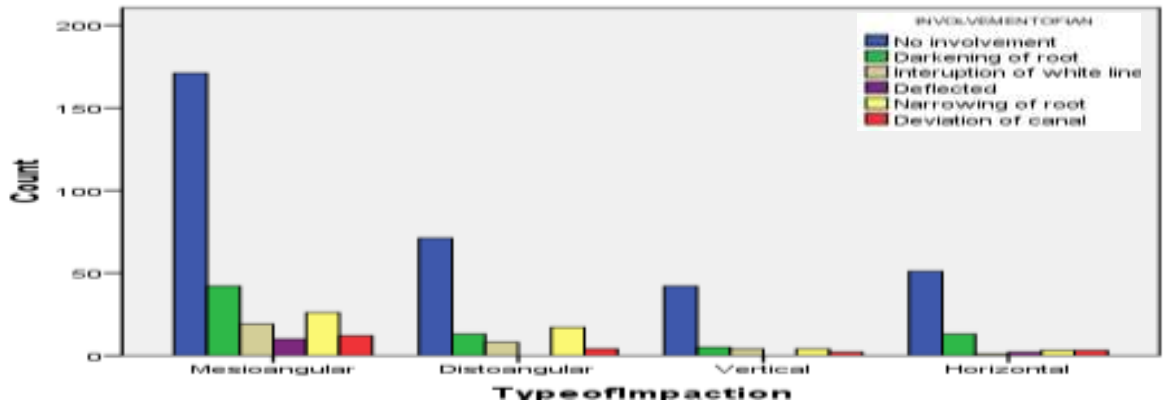

FIG 12: IMPACTED MANDIBULAR THIRD MOLAR AND RELATIONSHIP WITH IAN

13. PREVALENCE OF TYPE OF IMPACTION TO THE COMPLICATIONS OF IMPACTION OF LOWER THIRD MOLARS

Crosstab

			Complication						
			None	Bleeding	Trismus	Nerve Injury	Swelling	Infection	Total
TypeofImpaction	Mesioangular	Count	246	4	16	6	4	4	280
		% within TypeofImpaction	87.9%	1.4%	5.7%	2.1%	1.4%	1.4%	100.0%
		% within Complication	53.2%	100.0%	45.7%	60.0%	50.0%	100.0%	53.5%
	Distoangular	Count	97	0	11	2	3	0	113
		% within TypeofImpaction	85.8%	.0%	9.7%	1.8%	2.7%	.0%	100.0%
		% within Complication	21.0%	.0%	31.4%	20.0%	37.5%	.0%	21.6%
	Vertical	Count	52	0	3	1	1	0	57
		% within TypeofImpaction	91.2%	.0%	5.3%	1.8%	1.8%	.0%	100.0%
		% within Complication	11.3%	.0%	8.6%	10.0%	12.5%	.0%	10.9%

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Horizontal	Count	67	0	5	1	0	0	73
	% within TypeofImpaction	91.8%	.0%	6.8%	1.4%	.0%	.0%	100.0%
	% within Complication	14.5%	.0%	14.3%	10.0%	.0%	.0%	14.0%
Total	Count	462	4	35	10	8	4	523
	% within TypeofImpaction	88.3%	.8%	6.7%	1.9%	1.5%	.8%	100.0%
	% within Complication	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 13: IMPACTED MANDIBULAR THIRD MOLAR AND ASSOCIATED COMPLICATION

The distributions of the angulations of impaction for the tooth impacted do not differ significantly (Pearson Chi-Square, p = 0.707)(Table 13, Fig 13)

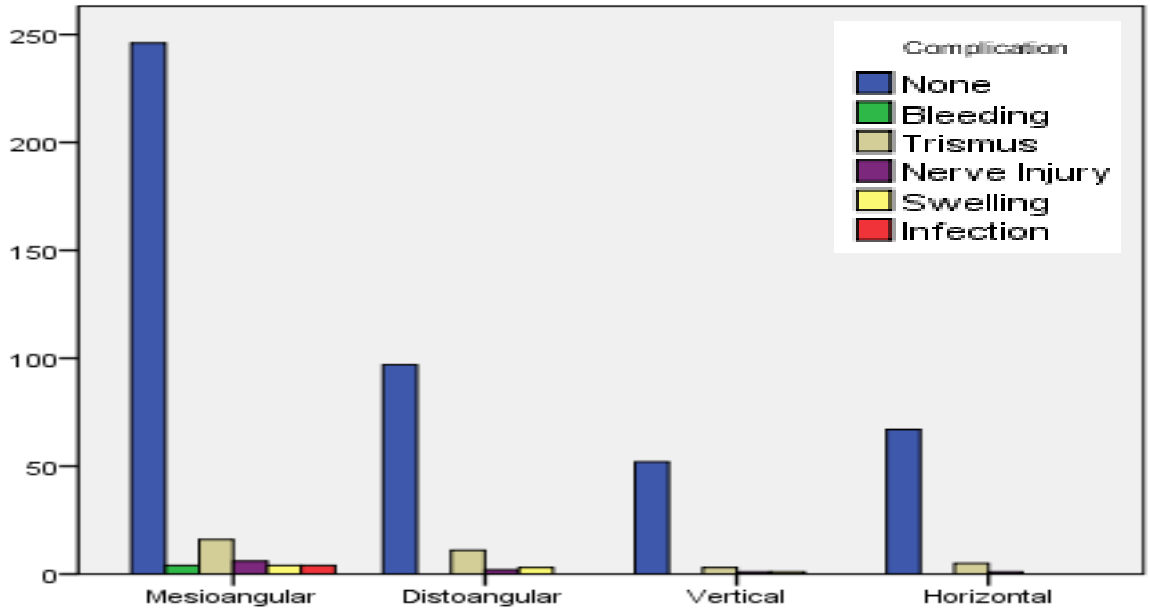

FIG 13: IMPACTED MANDIBULAR THIRD MOLAR AND ASSOCIATED COMPLICATION

IV. DISCUSSION

The surgical removal of impacted mandibular third molar teeth is one of the most common surgical procedures performed in oral and maxillofacial surgery and predicting the possible difficulties in the removal is a constant challenge for surgeons.[2,4,7,12,15]

A total number of 523 cases were selected and their records were retrieved. A panoramic radiograph or intraoral periapical radiographs with relevant clinical data, such as gender, age, and chief complaint/indications for removal of impacted lower third molar were collected for assessment.

Five hundred and twenty three patients were included in the present study. The age ranged from 14 to 65 years, with a mean age of 35.0 years. The median age of the male patients was 25.5 years and for females 22 years. This result was almost the same as that of a similar study. The mean age of this studydid not corroborate with the study of vents et al; (1993)[9,19,26,38]in which they measured a mean age of 24.4 years.

Radiographs of 523 patients withimpacted mandibular third molars that reportedfor the extraction of impacted mandibular third molars were assessed for 1 year, In which (81.5%) IOPA and (18.5%) wereorthopantomograph.

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This study revealed that females more commonly presented with symptoms. There were 280 (53.5%) female patients compared to (46.5%) male patients. This finding is in agreement with that of Venta et al; (1993)[39], where it was noted that females were more commonly affected than males with symptomatic impactions. The study did not collaborate with that of Ali Hasssan;(2010)[17]which had 536 male and 503 female patients. This study also showed that females between 21 and 30 years were more frequently affected by symptomatic impactions than males. Males between 31 and 40 years were more prone to develop symptomatic impactions than females.

On assessment regarding the prevalence of symptoms related to impaction in lower third molars on the right (48)and left (38) side, It was found to have 255 patients (48.8%) had impaction on the right side while rest 268 (51.2%) had on the left side (38). This result was similar to that of Ali Hasssan;(2010)[17] which showed no significant difference in the frequency of impaction between the right and left sides in both jaws.

On the assessment of angle of impaction, it was found that the mesioangular inclination predominated (53.5%), followed by the disto-angular position (21.6%), and the horizontal impaction (14.0%). The was the least common type of impaction encountered vertical inclination (10.9%). This was similar to the study done by Hatem et al (2016)[18] where the most prevalent angular position was mesioangular (34.6%) followed by vertical (31.3%) and distoangular (27.7). the results of our study were different from Venta et al; (1993)[45] results where the vertical inclination was the most common (62%), followed by the distoangular (20%) and mesioangular inclination (18%).

On basis of their chief complaint 523 patients that reported for removal of third molars were categorized as pain and without pain.Therapeutic extraction of impacted third molar was required in 113 patients (21.6%) undergoing orthodontic treatment. 31 (5.9%) patients that were undergoing treatment in second mandibular molar e.g.: crown fixation, root canal procedure also required removal of the mandibular impacted third molar. 42 Patients (8.0%) have reported chronic cheek bite and Pericoronitis developed in 114 patients i.e. (21.8%) Cysts developed in 8 (1.5%) of the cases. Caries or resorption of impacted third molars was evident in 145 (27.7%) of the cases with some involving caries in the distal surface of the second molars. 70 patients (13.4%) reported periapical infections that were associated with dental caries about the impacted lower third molars. Pursafar, F et al (2010), Sherifa Mostafa Sabra, and Mahitab Mahmoud Soliman (2013)[8,20,24] also had similar indications for removal of mandibular impacted third molar in three study.

The prevalence of symptoms related to the angle of impaction in this sample was recorded and it was found that the mesioangular inclination predominated (53.5%), followed by the disto-angular position (21.6%), and the horizontal impaction (14.0%). The was the least common type of impaction encountered vertical inclination (10.9%). This study is in agreement with the findings of Nzima (2005), who found that mesioangular impactions were the most predominant type of impaction which was followed by vertical and horizontal impactions. Studies in Nigeria showed that mesioangular type of impaction was the most frequently seen (Gbotolorun, et al. 2007; Obiechina, et al. 2001)[17,12,]. Likewise, (Quek, et al.2003)[29,36,40] stated that it was also the most common type among Chinese (80%) and Korean populations (46.5%). The radiographic evaluation indicated a close relationship between the mandibular third molar tooth and the inferior alveolar canal. 64.1% showed no involvement of nerve whereas 14% depicted darkening of the root. Narrowing of the root was seen in 9.6 % and deviation of the canal in 4.0 %. 2.3% showed a deflection of the root from the canal.These results were similar to that done by Nicolas A (2005)[25]where significant statistical and clinical co-relation was observed between radiographic signs like darkening of the

root, interruption of the white line, and nerve injury.

On the assessment of complications post-operatively it was found that 462 (88.3%) patients reported no complications. Trismus was a major complication seen in 35 (6.7%) patients followed by nerve injury in 10 (1.9%) and swelling in 8 (1.5%). Bleeding and infection were seen common in 4 (0.8%) patients. Mansuri et al (2013)[3] had similar results that showed a higher complication rate for mandibular third molar extractions. The findings were different from that ofPitekova L 2010[3,11,41] where alveolar osteitis was seen in most cases followed byinfection and post-operative bleeding. Paresthesia due to nerve injury was less in our study.

The study revealed that there was no significant relationship of the type of impaction of the third molar to the gender of the patient, tooth impacted (48 or 38),its involvement to the inferior alveolar canal, or any complications associated with the impacted third molar. This study showed a significant correlation between the angulation of the tooth to the indications for the removal of the third molar. the mesioangular impaction was seen as a most common form of impaction 53.5 % that showed dental caries in 21.4% patients as the major complaint about extraction of the molars.This was followed by therapeutic removal 18.6% and pericoronitis 12.9%. the results were similar to Knutsson et al; (1996)[50] which showed a high caries frequency of 31% with impactions. He also noted that caries mostly occurred in association with mesioangular impactions. Partially exposed impactions were the most prone to develop caries.

V. CONCLUSION

This study demonstrated that females were twice more likely to present with symptomatic impactions than males. It was also clear that female patients were more prone to develop symptoms associated with impacted mandibular third molars at an earlier age than males, as the mean age of the genders was 25.5 and 22 years respectively.

This study revealed that mesioangular impacted teeth were the most common type associated with dental caries were the most frequent type to present with symptoms. The study sample also showed that pericoronitis was the most common complaint that necessitated the removal of impacted teeth. Pericoronitis and periapical infection were more frequently seen with partially impacted third molars than completely impacted teeth.

The variation in the findings as reported here and in the literature indicates that there are various factors at play that may be related to demographical, and/or environmental conditions.The presence of impacted third molars means there is a need to have more specialized personnel and improvement in the necessary equipment.

The results of this study can be used as baseline data for future studies involving impacted third molars. Such studies should include various other classifications and complications associated with impactions. The study can also include the impactions of maxillary third molars and canines in the future.

DECLARATIONS

On behalf of all Co-Authors, I shall bear full responsibility for the submission. I confirm that all authors listed on the title page have contributed significantly to the work, have read the manuscript, attest to the validity and legitimacy of the data and its interpretation, and agree to its submission.

Ethics Approval and consent to participate- NOT APPLICABLE

Consent for publication – not applicable

Competing interest – none

Author contribution- declared above

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Availability of data and material – with consent from departmental OPD logbook

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