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Indications for Extraction of Impacted Mandibular Third Molars and Related Pathologies

Misbah Ashfaq[1], Ali Farooq[2], Rafay Mannnan Mian[3], Ehsan Haider[4], Aftab Ahmed Kumbhar[5], Afsheen Riaz[6]

1 *Registrar, Operative Dentistry & Endodontics, FMH College of Medicine and Dentistry, Lahore Pakistan*
Data collection, Perform experimental work, Paper writing

2 *Associate Professor, Department of Oral & Maxillofacial Surgery, Sharif Medical & Dental College, Lahore Pakistan*
Data collection, Result analysis

3 *Assistant Professor, Department of Oral & Maxillofacial Surgery, de'Montmorency College of Dentistry, Lahore Pakistan*
Compiled the paper

4 *Assistant Professor & Head of Department of Orthodontics, Multan Medical & Dental College, Multan Pakistan*
Data analysis, Review the paper

5 *Assistant Professor, Department of Oral & Maxillofacial Surgery, Bhitai Dental & Medical College, Mirpurkhhas Pakistan*
Data analysis, Sample collection

6 *Senior Registrar, Operative Dentistry & Endodontics Shahida Islam Dental College, Lodhran Pakistan*
References write up

CORRESPONDING AUTHOR
Dr. Ali Farooq
Associate professor Oral & Maxillofacial Surgery Department of Sharif Medical and Dental College Lahore
Email: ali_farooq_82@yahoo.com

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ABSTRACT

Background: The extraction of impacted mandibular third molars is a common dental procedure, often necessitated by various pathologies and symptomatic presentations. **Objective:** To determine the indications for extraction of impacted mandibular third molars and related pathologies. **Study Design:** Descriptive cross-sectional study. **Settings:** Department of Oral and Maxillofacial Surgery Department in Sharif Medical and Dental College Lahore. **Duration:** From October 2021 March 2022. **Methods:** Selection criteria for patient inclusion were patients who were 18 years and above 50 years, who had third molars impacted in the mandibular region and had undergone extraction. Simple radiographic examination was made using panoramic radiographs and cone-beam computed tomography (CBCT) for evaluate position and conditions of the impacted third molars. The collected data analysed using statistical package (SPSS version 26. 0). **Results:** Of the 360 patients included in the study, 212 (58.9%) were male and 148 (41.1%) were female, with a mean age of 25.45 ± 7.95 years. The primary indication for extraction was pericoronitis (48.3%), followed by pulpitis or caries of the third molar (15.0%), caries affecting the second molar (12.8%), and periodontitis (7.8%). Radiographic examination revealed that 137 (38%) cases had lesions, of which 50 (36.5%) were asymptomatic at the time of extraction. Histologically, the most common findings were chronic inflammatory lesions (55.8%) and dental follicles (25.3%), with radicular cysts and dentigerous cysts being the most common cystic lesions. **Conclusion:** Our study highlights that the primary indication for the extraction of impacted mandibular third molars was pericoronitis, accounting for nearly half of the cases.

Keywords: *Caries, Impacted mandibular third molars, Pericoronitis, Pulpitis, Radiographic lesions.*

INTRODUCTION

The surgical removal of impacted mandibular third molars also known as the acclaimed 'wisdom teeth' is probably the most common surgical procedure carried out in the dental practice today.[1] These are the last teeth to develop in the oral cavity and are prime candidates for impaction due to crowding in the dental arches and problems ensuing there from.[2,3] Mandibular third molars can be in mesioangular, distoangular, horizontal, and vertical impactions based on the orientation of the mesial or distal surface of the third molar and the second molar alveolus and the jaw. Different positions can affect complications or extraction, and nuclear, missle and gatekeeper positions can vary based on these factors.[4] Pericoronitis is an inflammation that involves pain and infection and may extend to affect the surrounding elements, causing severe primary problems if cases go untreated.[5]

A target tooth is tough to clean because the bristles of the toothbrush cannot reach the interior part of it; thus, it is a breeding ground for plaque and bacteria.[6] Other significant factors that must be taken surrounded by extracting impacted mandibular third molars include cysts and tumours. In extreme occasions the moderative malignant tumors like ameloblastomas may occur and hence early detection is required to avoid massive

destruction of tissue mass and the complicated surgeries which might be required.[7]

Patient needs and orthodontic objectives may be considered a factor in extraction of impacted mandibular third molar teeth. For patients who develop these teeth, an orthodontist must bother as their presence can complicate the alignment of teeth and the intended goals of the orthodontic treatment.[8] Discomfort and pain are two key indicators that can encourage health care seeking among patients suffering from impacted mandibular third molars.[9] Prophylactic extraction as a concept is often debated, although some patients and surgeons support this decision, others prioritize any conservation of a 'normal' anatomy as the key goal.[10]

Preserving treatment of third molars in the mandibular area must be considered only on an individual basis by evaluating the patient's age, general health, and symptoms as well as the position of the teeth. These diagnostic instruments assist in a period of assessment in that they enable the formulation of a care plan that is free from flaws thus enhancing the quality of outcomes.

METHODS

Ethical permission was obtained from the hospital's ethical review board (SMDC/SMRC/273/23). A total sample of 360 patients was calculated using OpenEpi, maintaining a 95% confidence interval and a 5% margin of error taking overall prevalence of impacted third molar was found to be 26% in such patients.[11] Out of these patients 360 patients were included in the study and patients were selected from those patients who sought treatment in Oral and Maxillofacial Surgery in Sharif Medical and Dental College Lahore over 6 months from October 2021 March 2022.

Selection criteria for patient inclusion were patients who were 18 years and above 50 years, who had third molars impacted in the mandibular region and had undergone extraction. Patients with systemic illnesses that would not favour surgery, patients with incomplete clinical data, or patients who declined to be part of the study were deemed unsuitable for the study.

Data was took from the patients' on age, gender, examination findings, radiographic findings, extraction indications, as well as postoperative results. Simple radiographic examination was made using panoramic radiographs and cone-beam computed tomography (CBCT) for evaluate position and conditions of the impacted third molars. All of the extractions were done under local analgesia with or without the use of intravenous sedation as per patient's request and medical history. The techniques used during the surgeries involved routine operations of flap operation, bone reduction, teeth division, and closing. Patients were advised on the necessary measures that they should take after the surgery and scheduled follow up visits to check for incision site healing and any possible complications.

The main parameters were the frequency of each of the indications for extraction and the occurrence of the consequent pathologies. Secondary outcomes assessed included the assessment of post-operative recovery. The collected data were tabulated on structured dataset and analysed using statistical package (SPSS version 26. 0).

RESULTS

Among 360 patients who sought impacted mandibular third molar extraction, 148 (41.1%) were female and 212 (58.9%) were male. The age ranged from 15 to 60 years, with a mean of 25.45 ± 7.95 years. In Table 1, 56.9% of participants were 15-25, followed by 26-35 (35.0%) given in table 1.

Table 1: Age and gender distribution of study participants

Variables	Category	N (%)
Gender	Female	148(41.1%)
	Male	212(58.9%)
Age groups (years)	15-25	205(56.9%)
	26-35	126(35.0%)
	36-45	23(6.4%)
	46-60	6(1.7%)
	Mean ± SD	25.45 ± 7.95

Impacted mandibular third molars were primarily extracted due to pericoronitis (48.3%), followed by third molar pulpitis/caries (15.0%), second molar caries (12.8%), periodontitis (7.8%), and other pathologies (15.9%), as shown in Table 2.

Table 2: Indications of extraction of impacted mandibular 3rd molar tooth

INDICATIONS	N (%)
Pericoronitis	174(48.3%)
Pulpitis/caries 3rd molar	54(15.0%)
Caries 2nd molar	46(12.8%)
Periodontitis	28(7.8%)
Cysts/Tumors	18(5.0%)
Root resorption	9(2.5%)
Orthodontic	7(1.9%)
Prosthetic	2(0.6%)
Pain of Unknown Origin	22(6.1%)

Table 3 shows that out of 360 impacted mandibular third molar extractions, 137 (or 38%) had lesions diagnosed

radiographically, with 36.5% of those patients reporting no symptoms throughout the procedure.

Table 3: Angulation and side of impacted mandibular 3rd molar tooth

Radiographic lesions	N (%)	Clinically symptomatic	Clinically asymptomatic
Caries in impacted mandibular 3rd molar	43 (31.4%)	29 (67.4%)	14 (32.6%)
Chronic periodontitis	7 (5.1%)	4 (57.1%)	3 (2.9%)
External resorption of adjacent 2nd molar	35 (25.5%)	18 (51.4%)	17 (48.6%)
Fractured teeth	8 (5.8%)	8 (100.0%)	0
Periapical radiolucency	26 (19.0%)	17 (65.4%)	9 (34.6%)
The disease of follicle including cyst and tumor	18 (13.1%)	11 (61.1%)	7 (38.9%)

Histological diagnosis of 95 specimens from impacted third molars showed chronic inflammatory lesions as the most common finding (55.8%), followed by dental follicle (25.3%). Radicular cysts (6.3%) and dentigerous cysts (4.2%) were the most prevalent cystic lesions. Squamous cell carcinoma was found in 2.1% of cases, and ameloblastoma in 3.2%, as detailed in the table 4.

Table 4: Histology of impacted mandibular third molar lesions

Lesion	Type	N (%)
Cyst	Radicular cyst	6(6.3%)
	Dentigerous cyst	4(4.2%)
	Odontogenic keratocyst	3(3.2%)
Periapical inflammation	Chronic inflammatory lesion	53(55.8%)
Dental follicle	-	24(25.3%)
Tumors	Ameloblastoma	3(3.2%)
	Squamous cell Carcinoma	2(2.1%)

DISCUSSION

Our study included 360 patients undergoing extraction of impacted mandibular third molars, with 148 (41.1%) females and 212 (58.9%) males. Primary indications for extraction were pericoronitis (48.3%), pulpitis/caries of the third molar (15.0%), caries affecting the second molar (12.8%), and periodontitis (7.8%). Krishnan *et al*. (2009) also reported recurrent pericoronitis as the most common indication (54%), followed by pulpitis/caries (31%). In contrast, Kumar (2020) found caries as the predominant indication (66.0%), with lower rates for pericoronitis (18.5%) and periodontitis (14.1%). These discrepancies may stem from differences in population demographics and dental practices.[13]

Our study showed an even distribution of impacted molars between the left (47.2%) and right (52.8%) sides. Gender distribution showed more males (58.9%) than females (41.1%) undergoing extraction, differing from Kumar (2020), who reported a higher prevalence in females (51.2%). This variation might reflect regional differences in healthcare-seeking behavior and genetic factors. The mean age of our patients (25.45 ± 7.95 years) indicates early adulthood as the common period for third molar issues, consistent with Kumar (2020), who found the highest prevalence in the 21-30 age group. Our finding of 7.8% extractions due to periodontitis is lower than Kumar's 14.1%, possibly due to differences in periodontal disease prevalence and care standards.[14]

Among the 95 histopathologically diagnosed specimens in our study, chronic inflammatory lesions were the most common (55.8%), followed by dental follicle (25.3%), radicular cyst (6.3%), dentigerous cyst (4.2%), ameloblastoma (3.2%), and squamous cell carcinoma (2.1%). Subedi *et al*. (2020) similarly found chronic inflammatory lesions to be the most frequent histological finding (55.9%).[15]

Similarly, in a study conducted by Sardar *et al*. (2019), it was discovered that mesioangular impactions were the most prevalent, accounting for 38.7% of cases. This was followed by vertical impactions at 28.7%, distoangular impactions at 12.6%, and horizontal impactions at 10%. The most common indication for extraction in our study was pericoronitis (48.3%), which mirrors Sardar *et al*.'s finding of pericoronitis as the primary reason for extraction (48.4%).[16] Our study also identified a significant proportion of asymptomatic lesions (36.5%), which is notably higher than the proportion found by Shin *et al*. (2016), who reported a lower incidence of asymptomatic lesions but a higher prevalence of cystic lesions such as dentigerous cysts (76.4%) and keratocystic odontogenic tumors (17.6%).[17] This discrepancy could be due to differences in radiographic and histopathologic evaluation techniques or the age distribution of the study populations. Regarding the types of impactions, our findings showed a fairly even distribution between the left (47.2%) and right (52.8%) sides. This distribution aligns with Braimah *et al*. (2018), who also reported mesioangular impaction as the most frequent type (51.9%).[18]

Additionally, Sahibzada *et al*. (2022) & Ayub *et al*. (2023) reported a higher overall prevalence of radiographic lesions (43.3%), with caries being the most common

(20.5%). Their findings of chronic periapical inflammation in 34% and radicular cysts in 1.73% of cases are somewhat consistent with our findings of 6.3% radicular cysts and 55.8% chronic inflammatory lesions, indicating a similar pattern of pathology associated with impacted mandibular third molars.[19, 20]

CONCLUSION

Our study highlights that the primary indication for the extraction of impacted mandibular third molars was pericoronitis, accounting for nearly half of the cases. The findings underscore the importance of timely diagnosis and intervention to prevent associated pathologies and complications.

LIMITATIONS

A limitation of this study is the relatively small sample size of histological specimens.

SUGGESTIONS / RECOMMENDATIONS

Large-scale research should be done in future studies.

CONFLICT OF INTEREST / DISCLOSURE

None.

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