OPEN ACCESS
ORIGINAL ARTICLE

CAUSES OF REMOVAL OF IMPACTED MANDIBULAR THIRD MOLAR IN PATIENTS VISITING PESHAWAR DENTAL COLLEGE AND HOSPITAL, PESHAWAR

[1]MUHAMMAD ISHFAQ, [2]NADIA ASHRAF, [3]BEENA KANWAL KHAN, [4]TEHREEN ZAMAN, [5]WAJIHA AHMAD, [6]MARYAM JEHAN

ABSTRACT

Objective: *To determine the primary reasons for the removal of impacted mandibular third molars*

Materials and Methods: *The study was conducted at the department of Oral & Maxillofacial Surgery, Peshawar Dental College, Peshawar using Non-probability consecutive sampling technique on 131 participants. Patients aged 15 and above, Pakistani nationals of both genders, with impacted mandibular third molars, and who consented to participate were included. Data were collected through a structured questionnaire and clinical records, with informed consent obtained from each participant. Statistical analysis was performed using chi-square test.*

Results: *The study included 131 participants, with a mean age of 31.90±10.67 years. Pericoronitis was the most common reason for extraction, accounting for 35.11% of cases, followed by caries (25.95%) and chronic periodontitis (10.69%). Gender-based analysis revealed no significant differences in the frequency of caries, chronic periodontitis, cysts, tooth fracture, periapical pathology, or tumors between males and females. However, a higher proportion of males exhibited external resorption of the adjacent tooth compared to females (15.49% vs. 3.33%).*

Conclusion: *Pericoronitis was the primary reason for extracting impacted mandibular third molars, followed by caries and chronic periodontitis. Other reasons included external resorption, periapical pathology, cysts, tumors, and tooth fracture.*

Keywords: *Third Molar Extraction, Mandible, Pericoronitis, Caries, External resorption*

This article may be cited as: Ishfaq M, Ashraf N, Khan BK, Zaman T, Ahmad W, Jehan M. Causes of removal of impacted mandibular third molar in patients visiting Peshawar Dental College and Hospital, Peshawar. Pak Oral Dent J, 2024; 44(3):15-19.

INTRODUCTION

The third molar is the last tooth to erupt in the oral cavity, usually after the jaws have finished their growth, leading to its impaction. However, the etiology of impaction is multifactorial, involving genetic, environmental, and anatomical factors that impede the proper eruption of these teeth. As a result, it can lead to a range of clinical issues, including pain, infection, cysts, neoplasm, and caries to adjacent teeth. Lower third molar impaction is quite common and is often associated with various complications necessitating their removal.

Removal of impacted third molars is among the most common surgeries performed by oral surgeons. However, making decision for removing third molar is often not simple and straightforward. Surgeons must carefully weigh the risks and benefits of the surgical extraction of these teeth, taking into account potential complications and patient-specific factors. This decision-making process necessitates a thorough understanding of the specific indications that justify the removal of impacted mandibular third molars. Despite extensive research, the indications for the prophylactic removal of asymp-

[1] Muhammad Ishfaq, BDS, FCPS, Associate Professor, Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan Cell: 03349231859 Email: drishfaqwz1981@gmail.com
[2] Nadia Ashraf , BDS, FCPS, Assistant Professor, Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan. Cell: 03339791677 Email: dr.nadiaashraf7@gmail.com
[3] Beena Kanwal Khan, BDS, FCPS II Resident, Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan. Cell: 03355818847 Email: shafqatperveen25@gmail.com
[4] Tehreen Zaman , BDS, FCPS II Resident trinee, Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan. Cell: 03000258256 Email: tahreenzaman1@gmail.com
[5] Wajiha Ahmad, BDS, MPhil Dental Materials, Khyber Medical University, Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan. Cell: 03339642486 Email: wajihaahmad97@gmail.com
[6] Maryam Jehan, BDS, House Officer Peshawar Dental College and Hospital, Warsak road Peshawar, Pakistan. Cell: 0348075342 Email: maryamjehan636@gmail.com
Received for Publication: Mar 28, 2024
Revised: Jun 28, 2024
Approved: July 25, 2024

tomatic impacted third molars remain a topic of debate among dental professionals.[9] Understanding the specific reasons for the removal of these teeth can provide valuable information for clinical decision-making.

A study conducted at Libya investigated the indications for the removal of impacted lower third molars in 439 patients. The most common reasons for removal were recurrent pericoronitis (54%) and pulpitis/caries of the adjacent second molar (31%). Other indications included orthodontic reasons (2%) and cysts/tumors (5%). Pain and tenderness were the most frequently recorded symptoms. The lack of prophylactic removal was attributed to socioeconomic and logistical reasons.

This cross-sectional study aims to identify the various causes leading to the removal of impacted mandibular third molars in patients seen at the Oral and Maxillofacial Surgery department at Peshawar Dental College. There was no local study done in Peshawar before.

METHODOLOGY

This cross-sectional study was conducted at department of Oral & Maxillofacial Surgery, Peshawar Dental College, Peshawar. A non-probability consecutive sampling technique was used, enrolling all eligible patients who presented to the clinic and met the inclusion criteria until the desired sample size was achieved. The sample size was 131 at 95% confident level and 5% margins errors using 9.4%11 frequency of indication of third molar due to external root resorption.

Inclusion criteria were patients aged 15 and above, Pakistani nationals of both genders, patients presenting with impacted mandibular third molars, and patients who consented to participate in the study. Exclusion criteria included patients with incomplete clinical records, such as missing radiographs, pregnant females, and patients with systemic conditions that contraindicated the surgical removal of teeth.

Each patient provided written informed consent before being included in the study. The consent process entailed explaining the study's purpose, the procedures involved, potential risks and benefits, and the voluntary nature of participation. Patients were assured that their data would remain confidential and that they could withdraw from the study at any time without affecting their treatment.

Data were collected from participants using a structured questionnaire and from the patients' clinical records. A detailed clinical examination and radiographic evaluation (using orthopantomograms or intraoral periapical radiographs) were conducted to confirm the diagnosis of impaction. The questionnaire captured demographic information (age, gender), clinical presentation, and specific reasons for the removal of impacted mandibular third molars (e.g., pain, infection, orthodontic reasons, cysts or tumors, caries in the third molar or adjacent teeth, pericoronitis, pulpitis/caries in the third molar, caries in the second molar, periodontitis, orthodontic reasons, cysts/tumors, prosthetic reasons, root resorption, unexplained facial pain, or no reason).

Data were analyzed using statistical R software 4.3.3. Descriptive statistics were used to summarize the data. Frequencies and percentages were calculated for categorical variables (e.g., reasons for tooth removal, type of impaction, and gender). Mean and standard deviation were calculated for continuous variables (e.g., age). Chi-square tests were used to assess the association between genders. A P value of ≤ 0.05 was considered significant.

RESULTS

The mean age was 31.90±10.67 years. Males (54.20%) were more than females. (Table 1) Age distribution is shown in Fig 1.

Among the reasons for the extraction of mandibular impacted third molars in this study, the most common was pericoronitis, accounting for 46 cases (35.11%) followed by caries, noted in 34 cases (25.95%). Rest of details is given in Table 2.

In the analysis of reasons for the extraction of mandibular impacted third molars by gender, no statistically significant differences ($p = 0.4$) were observed in the frequency of caries between females (26.67%) and males (25.35%), Similarly, there were no significant gender differences in the frequency of chronic periodontitis, cyst, fracture of tooth, periapical pathology, or tumor. However, a little high difference was noted in the frequency of external resorption of the adjacent tooth, with a higher proportion observed in males (15.49%) compared to females (3.33%). Additionally, while pericoronitis was the most common reason for extraction in both genders, there were no significant gender differences in its frequency. (Table 3)

DISCUSSION

The present cross-sectional study provides information about various causes necessitating the extraction of impacted mandibular third molars. These findings can help in understanding the underlying reasons for such extractions, which can inform clinical decision-making and preventive strategies.

An impacted tooth occurs when it cannot erupt properly due to various reasons like misalignment or lack of space. Guidelines by the National Institute for Clinical Excellence (NICE) help determine when extraction is necessary. Reasons for lower third molar extraction include untreatable pathology, caries affecting adjacent teeth, periodontal disease, resorption, cyst formation,

TABLE 1: DISTRIBUTION OF AGE AND GENDER OF THE PARTICIPANTS

Characteristic	N = 131
Age (years), Mean ± SD	31.90 ± 10.67
Gender, n (%)	
female	60 (45.80)
male	71 (54.20)

TABLE 2: REASONS FOR EXTRACTION OF MANDIBULAR IMPACTED THIRD MOLAR

Reasons for extraction	N = 131
Caries	34 (25.95)
Chronic Periodontitis	14 (10.69)
Cyst	8 (6.11)
External resorption of the adjacent tooth	13 (9.92)
Fracture of tooth	3 (2.29)
Periapical pathology	7 (5.34)
Pericoronitis	46 (35.11)
Tumor	6 (4.58)

1n (%)

TABLE 3: REASONS FOR EXTRACTION OF MANDIBULAR IMPACTED THIRD MOLAR BY GENDER

Reasons for extraction	female, N = 60	male, N = 71	p-value*
Caries	16 (26.67)	18 (25.35)	0.4
Chronic periodontitis	8 (13.33)	6 (8.45)	
Cyst	3 (5.00)	5 (7.04)	
External resorption of the adjacent tooth	2 (3.33)	11 (15.49)	
Fracture of tooth	1 (1.67)	2 (2.82)	
Periapical pathology	3 (5.00)	4 (5.63)	
Pericoronitis	23 (38.33)	23 (32.39)	
Tumor	4 (6.67)	2 (2.82)	

n (%), *Fisher's exact test

impaction obstructing surgery, and infections like osteomyelitis or pericoronitis. Extraction decisions are based on thorough assessment of dental health, considering pathology, risks, and benefits.

This study population consisted of 131 participants, with a mean age of 31.90±10.67 years. Notably, a considerable proportion of participants fell within the 15-30 years age group, comprising 45.8% of the total sample. This observation aligns with existing literature suggesting that third molar impaction often becomes clinically evident during early adulthood. Third molars typically emerge during late adolescence or early adulthood. Studies by Kautto et al. and Eklund and Pittman indicate that the peak age for extraction is typically between 23 to 25 years, with a significant number of extractions occurring within this age range. However,

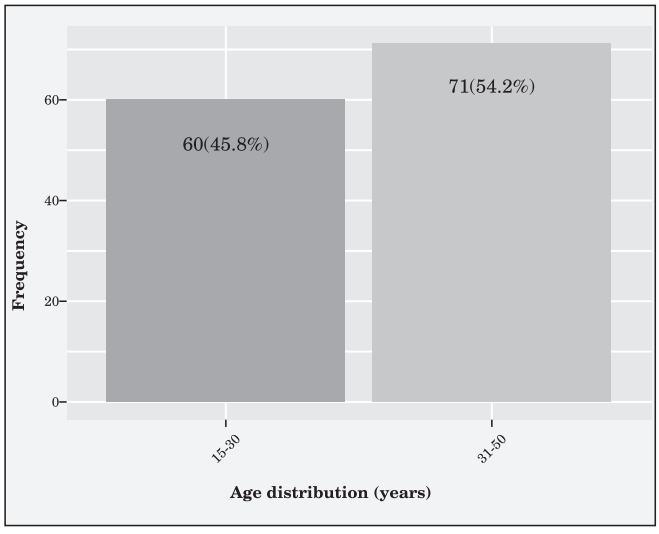

Fig 1: Age categories of the participants

some individuals may retain their third molars well into their forties or beyond, especially if they are asymptomatic and well-aligned.

Pericoronitis emerged as the predominant indication for extraction, accounting for 35.11% of cases in our cohort. This shows the clinical significance of managing partially erupted third molars, which are susceptible to inflammation and infection due to inadequate oral hygiene practices and anatomical factors. The Indian study analyzed a substantial sample size of 1344 surgically removed impacted mandibular third molars. Among the various reasons identified for extraction, pericoronitis emerged as the most prevalent, accounting for a significant majority at 62.9%. Similar findings were reported by another study in Libya.

Caries and chronic periodontitis were also common reasons for extraction, affecting 25.95% and 10.69% of participants, respectively. These findings emphasize the importance of regular dental examinations and preventive measures to mitigate the risk of caries and periodontal disease in impacted third molars. Similar results were found in previous studies. A descriptive study conducted at the Lahore, Pakistan included 271 patients with 382 impacted mandibular third molars. Among these patients, a total of 324 pathologies were identified, with dental caries of the third molar being the most common, accounting for 38.89% of cases. Pericoronitis was the second most prevalent pathology at 29.01%, followed by periodontal disease at 14.19%. Additionally, cysts and tumors were observed at a lower frequency of 3.39%.

Furthermore, our analysis revealed gender-specific differences in the frequency of certain extraction indications. While no significant disparities were observed in the prevalence of caries, chronic periodontitis, cysts, fractures, periapical pathology, or tumors between males and females, a notable discrepancy was noted in the incidence of external resorption of adjacent teeth. Males exhibited a higher prevalence of external resorption compared to females, suggesting potential anatomical or biological factors contributing to this disparity. Similarly no association was found in previous study regarding pericoornitis associated with third molar impaction and gender. However, further research is warranted to elucidate the underlying mechanisms driving such differences.

CONCLUSION

Pericoronitis emerged as the most common reason for the extraction of impacted mandibular third molars in this study, followed by caries and chronic periodontitis. External resorption of the adjacent tooth, periapical pathology, cysts, tumors, and tooth fracture were also identified as reasons for extraction, albeit at lower frequencies. These findings show diverse range of factors contributing to the need for surgical intervention in impacted third molar cases.

REFERENCES

1 Tai S, Zhou Y, Pathak JL, Piao Z, Zhou L. The association of mandibular third molar impaction with the dental and periodontal lesions in the adjacent second molars. J Periodontol. 2021 Oct;92(10):1392-401.

2 Siotou K, Kouskouki MP, Christopoulou I, Tsolakis AI, Tsolakis IA. Frequency and local etiological factors of impaction of permanent teeth among 1400 patients in a Greek population. Dent J (Basel). 2022 Aug 11;10(8):150.

3 Singh S. Comprehensive assessment of etiology, complications and quality of life as related following impacted third molar surgery: a questionnaire based original study. J AdvancE Med Dent Sci Res. 2019;7(11):74-8.

4 Negreiros RM, Biazevic MG, Jorge WA, Michel-Crosato E. Relationship between oral health-related quality of life and the position of the lower third molar: postoperative follow-up. J Oral Maxillofac Surg. 2012 Apr 1;70(4):779-86.

5 Eshghpour M, Shaban B, Sarfarzi S, Samieirad S. Frequency and difficulty score of lower third molar impaction in the patients referring to the oral and maxillofacial surgery department of Mashhad Dental School (2017-2018). J Mashhad Dent School. 2018;42(4):340-7.

6 Sologova D, Diachkova E, Gor I, Sologova S, Grigorevskikh E, Arazashvili L, Petruk P, Tarasenko S. Antibiotics efficiency in the infection complications prevention after third molar extraction: a systematic review. Dent J (Basel). 2022 Apr 18;10(4):72.

7 Bhargava PG, Sobh VI, Bhargava D. Indications and contraindications for surgical extraction of the mandibular third molars. In: Transalveolar Extraction of the Mandibular Third Molars. CRC Press; 2022. p. 17-22.

8 Costa MG, Pazzini CA, Pantuzo MC, Jorge ML, Marques LS. Is there justification for prophylactic extraction of third molars? A systematic review. Braz Oral Res. 2013 Mar;27:183-8.

9 Hounsome J, Pilkington G, Mahon J, Boland A, Beale S, Kotas E, Renton T, Dickson R. Prophylactic removal of impacted mandibular third molars: a systematic review and economic evaluation. Health Technol Assess. 2020 Jun;24(30):1.

10 Low SH, Lu SL, Lu HK. Evidence-based clinical decision making for the management of patients with periodontal osseous defect after impacted third molar extraction: A systematic review and meta-analysis. J Dent Sci. 2021 Jan 1;16(1):71-84.

11 Krishnan B, Sheikh MH, Rafa EG, Orafi H. Indications for removal of impacted mandibular third molars: a single institutional experience in Libya. J Maxillofac Oral Surg. 2009 Sep;8:246-8.

12 National Institute for Clinical Excellence (NICE). Guidelines for wisdom tooth removal (updated November 2003). Available from: http://www.nice.org.uk.

13 Kautto A, Vehkalahti MM, Ventä I. Age of patient at the extraction of the third molar. Int J Oral Maxillofac Surg. 2018 Jul 1;47(7):947-51.

14 Eklund SA, Pittman JL. Third-molar removal patterns in an insured population. J Am Dent Assoc. 2001 Apr 1;132(4):469-75.

15 Kim JY. Third molar extraction in middle-aged and elderly patient. J Korean Assoc Oral Maxillofac Surg. 2021 Oct 10;47(5):407.

16 Nguyen BN, Nguyen-Le CT, Nguyen BL, Le SH. Risk factors associated with the severity of pericoronitis of mandibular third molar. Clin Oral Investig. 2024 May 11;28(6):307.

17 Subedi S, Koirala U, Shrestha B. Indications for removal of impacted mandibular third molars and associated pathologies. JGMC Nepal. 2020 Dec 25;13(2):134-9.

18 Shahzad MA, Marath MA, Chatha MR, Sohail A. Evaluation of patterns of mandibular third molar impactions and associated pathologies. Pak Oral Dent J. 2016 Jun 1;36(2).

19 Rezvi FB, Balasubramaniam A, Chaudhary M. Prevalence of pericoronitis in impacted mandibular third molar: A retrospective analysis of 86,000 patient records over nine months. J Contemp Issues Bus Gov. 2020 Aug 30;26(2):286-93.

CONTRIBUTIONS BY AUTHORS

1 Muhammad Ishfaq:	Design conceived, wrote original draft, and formal analysis.
2 Nadia Ashraf:	Reviewed final draft.
3 Beena Kanwal Khan:	Data analysis
4 Tehreen Zaman:	Review for important intellectual concept.
5 Wajiha Ahmad:	Data analysis
6 Maryam Jehan:	Literature search, data collection