

Examining The Reasons behind Third Molar Extraction; A Look Back in Time

Tooba Saeed, Nabeela Riaz, Samreen Younus, Saba Hanif, Hammad Latif, Rana Zeerak

ABSTRACT

Objective: Extraction of third molar tooth is a frequently performed procedure in department of oral and Maxillofacial surgery, for various justified reasons. The objective of our study is to identify the reasons for extraction of third molar tooth in patients presenting at the University Dental Hospital, Lahore.

Methodology: In May 2022, a retrospective study was carried out at The University of Lahore's University Dental Hospital. Records from the oral and maxillofacial surgery department were searched for relevant data between January 1, 2021, and December 31, 2021. There were 200 people in the sample. SPSS version 25 was used to compile and analyze the data. Standard descriptive analysis was initially performed, followed by chi-square analysis.

Results: Records of 200 patients were gathered, with 56 percent being females and 44 percent males. Wisdom teeth extractions were more prevalent in patients aged between 31 to 40 years. Mandibular molar extractions were more common. Surgical methods were employed in 55 percent of cases, while non-surgical methods were used in 45 percent.

Caries was the most prevalent reason for extraction, accounting for 64 percent, followed by mobility at 13 percent. Other reasons for extraction included broken root fragments and impaction, each contributing 9.5 percent. Pericoronitis was observed in 3.5 percent of cases, and orthodontic reasons were also noted.

Conclusion Individuals aged 18-40 predominantly underwent third molar extraction, with dental caries being the primary reason for extraction. Pericoronitis was major cause in the younger age group, whereas mobility was more common in the older age group. Prophylactic extraction was not widely practiced in our clinical setting.

KEYWORDS: Extraction, Third molar, Caries, Pericoronitis, Reasons

INTRODUCTION

Wisdom teeth, also known as third molars, pose significant challenges for the younger population.

Tooba Saeed,¹ BDS, FCPS

Assistant Professor

Nabeela Riaz,² BDS, FCPS, MCPS

Professor

Samreen Younus,³ BDS, FCPS

Demonstrator

Saba Hanif,⁴ BDS, MSc

Demonstrator

Hammad Latif,⁵ BDS

House Officer

Rana Zeerak,⁶ BDS

House Officer

^{1,5,6}University College of Medicine and Dentistry, The University of Lahore, LHR, PAK.

²⁻⁴King Edward Medical University, LHR, PAK.

Correspondence:

Tooba Saeed

tooba.saeed@ucd.uol.edu.pk

The reduction in jaw size over time, as a result of evolution, has led to a trade-off where an increase in brain size comes at the cost of a smaller jaw. This has caused third molars to move towards a vestigial state, and in many instances, there is not adequate space for them to properly erupt or align in the mouth, thus called impacted or malaligned respectively.¹ In this scenario, they serve no purpose in chewing and do not contribute to mastication. However, they play a significant role in causing numerous issues, which is why they are extensively discussed in dental literature.^{2,3}

Wisdom tooth buds typically emerge around the age of 8 and usually erupt between 18 to 21 years old, although variations in the normal eruption process exist.^{4,5} An impacted tooth is one that cannot erupt properly in occlusion due to interference, malposition, or a lack of room in the

arch. Third molars are the last teeth to erupt, thus there's a higher chance of them getting impacted.^{6,7} In oral and maxillofacial surgery extraction of third molar is a common procedure for a number of valid reasons, such as treating unexplained pain, preventing jaw fractures, treating dental caries, periodontal disease, pericoronitis, root resorption of neighboring teeth, impacted teeth under dental prosthesis, odontogenic cysts and tumors, and facilitating orthodontic treatment.^{8,9}

Deciding whether to keep or remove impacted mandibular third molars can be a complicated process. Surgical removal poses potential risks, including nerve damage, dry socket, infection, harm to nearby teeth, bleeding and mandible fracture. However, keeping impacted third molars might lead to diseases that need more complex surgery, particularly when the patient is older and the surgery is more difficult because of underlying medical issues. Because of this, surgeons must carefully consider the risk-benefit ratio before deciding on the best course of action.^{10,11} In the United States, around ten million third molars are extracted annually, incurring a cost exceeding \$3 billion. Despite the majority of individuals in the United States having health insurance, patients in our country may possess limited resources. This costly procedure, combined with potential complications, presents a challenge for both patients and maxillofacial surgeons.^{12,13} This prompted our study to explore why third molars are being extracted in our population and to identify any preventable causes.

METHODOLOGY

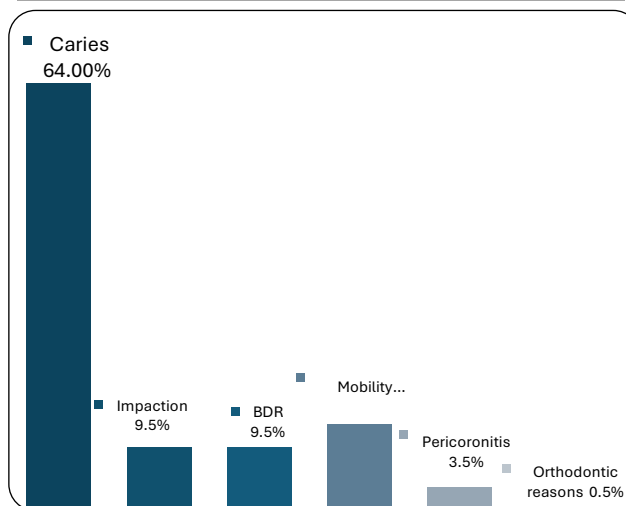
A retrospective cross-sectional study was carried out at the Department of Oral and Maxillofacial Surgery, University College of Dentistry, The University of Lahore. The clinical case records from January 1, 2021, to December 31, 2021, were examined. The study received approval from the Ethical Committee of the university college of dentistry (vide letter No. UCD/ERCA/12305), and a sample size of 200 was determined with a 95%

confidence level. Data, including patient age, gender, extracted tooth number, extraction techniques (surgical and non-surgical), reasons for extraction, and angulation of impaction in case of impacted mandibular molars, was collected from records of oral and maxillofacial surgery department. Orthopantomograms (OPG) were also examined to assess the angular position-ing of mandibular third molars. The data collected, was compiled and analyzed using SPSS version 25. Initial analysis involved standard descriptive methods, followed by a chi-square analysis.

RESULT

Data from 200 individuals were included in our study; 44% of the patients were male and 56% were female. With a mean age of 37, the age range covered the years 17 to 74. We separated the patients into five groups based on age. The age range with the highest prevalence, from 31 to 40 years old, was followed by 11 to 20 years old, with the lowest patient population.

Figure 1 Reasons for Extraction



Mandibular molars (58%) were more frequently extracted than maxillary molars (42%). Tooth number 48, right mandibular third molar, had the highest extraction rate at 29.5%, followed by tooth number 38, left mandibular third molar, at 28.5%, and tooth number 28, left maxillary third molar, was the least extracted, accounting for 17% of the

total extractions. Surgical methods were employed in 55% of the extractions, while non-surgical methods were used in 45% of cases.

The primary cause for extractions was dental caries, accounting for 64% of cases. Mobility was the next most common reason at 13%, while other factors, such as broken-down root (BDR) and impaction, each contributed 9.5%. The prevalence of pericoronitis was 3.5%. Additionally, orthodontic reasons were also observed as 0.5% (see Figure 1). We managed to retrieve 124 orthopantomograms (OPGs). The OPG analysis revealed that vertically angulated molars were the most common, constituting 55.6%. Mesioangular type followed at 37%, while horizontal angulation accounted for 5.6%. The least observed angulation type was distoangular, representing 1.9%.

The chi-square analysis examining the reasons for extracting wisdom teeth across different age groups yielded a significant p-value of < 0.05 . Notably, p

individuals in the 11-20 years age group exclusively exhibited impactions, while caries and BDR were observed in all other age groups. Pericoronitis and impaction were more frequent in younger patients, with their incidences decreasing as age advanced. Mobility was more prevalent in older patients (refer to Table 1).

Conversely, the chi-square analysis assessing the reasons for extracting third molars with respect to gender yielded an insignificant p-value of 0.25. Caries, BDR, impaction, and pericoronitis were observed more frequently in females than in males, while mobility was more prevalent in males. This suggests that periodontal problems are more common in males, possibly indicating a higher likelihood of neglecting oral hygiene compared to females (see Table 1).

The p-value for the cross-tabulation of reasons for extraction with tooth number was 0.108. Caries was slightly more prevalent in lower third molars, but BDR was equally common in both arches. The incidence of pericoronitis and impactions was higher in mandibular third molars, while mobility was almost equal in both arches (refer to Table 1).

Table 1: Chi square analysis of reasons for third molar extraction (n=200)

	Caries	BDR	Impacted	Mobile	Perico- ronitis	Ortho- dontic	p-values
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
Age							
11-20 Years	0 (0%)	0 (0%)	5 (2.5%)	0 (0%)	0 (0%)	0 (0%)	P=0.000
21-30 Years	40 (20%)	3 (1.5%)	7 (3.5%)	1 (0.5%)	4 (2%)	1 (0.5%)	
31-40 Years	43 (21.5%)	9 (4.5%)	6 (3%)	6 (3%)	3 (1.5%)	0 (0%)	
41-50 Years	23 (11.5%)	5 (2.5%)	0 (0%)	8 (4%)	0 (0%)	0 (0%)	
>50 Years	22 (11%)	2 (1%)	1 (0.5%)	11 (5.5%)	0 (0%)	0 (0%)	
Gender							
Male	51 (25.5%)	8 (4%)	9 (4.5%)	17 (8.5%)	3 (1.5%)	0 (0%)	P=0.25
Female	77 (38.5%)	11 (5.5%)	10 (5%)	9 (4.5%)	4 (2%)	1 (0.5%)	
Tooth number							
Tooth no 18	33 (16.5%)	8 (4%)	1 (0.5%)	8 (4%)	0 (0%)	0 (0%)	P=0.108
Tooth no 28	24 (12%)	3 (1.5%)	1 (0.5%)	4 (2%)	2 (1%)	0 (0%)	
Tooth no 38	31 (15.5%)	6 (3%)	11 (5.5%)	6 (3%)	3 (1.5%)	0 (0%)	
Tooth no 48	40 (20%)	2 (1%)	6 (3%)	8 (4%)	2 (1%)	1 (0.5%)	

value ≤ 0.05 taking significant

DISCUSSION

The extraction of most third molars is not primarily due to evolutionary changes but is instead linked to other factors related to poor oral hygiene. Caries, BDR, and periodontal disease account for 86% of total cases. These causes are preventable, and the promotion of fluoride use and oral hygiene instructions in the community can yield promising results, as seen in developed countries.¹⁴

Of the 200 patients, 44% were men and 56% were women. The age range was 17 to 74 years with mean age of 37 years. Patients aged 31-40 years had the highest prevalence of third molar extractions compared to other age groups, while the 11-20 years age group had the fewest extractions. The average patient age in another study, which included age groups from the second to the seventh decade, was reported to be 27 years old, with 40% of the patients being female and 60% male.¹⁵

There were 28.5% left mandibular molars and 29.5% right mandibular molars in our study. In contrast, 21% of the third molars in the left mandible and 17% of the right were found in the study by Gupta P et al.¹⁵ Our findings also align with those of a Nigerian study, in which a higher percentage of female patients and a majority of patients aged 20 to 29 made up the patient population. Contrary to our findings, the majority of patients in the Nigerian community had impaction of left-sided mandibular third molar.¹⁶ The majority of mandibular molars were extracted as opposed to maxillary ones, which is consistent with a study's findings that impaction is more often observed in the mandible (58.5%) than in the maxilla (41.5%).¹⁷

The analysis of orthopantomograms (OPGs) in our study showed that vertically angulated molars were common, accounting for 55.6%. Mesioangular molars followed at 37%, horizontal angulation at 5.6%, and distoangular angulation, the least observed type, at 1.9%. In a Nigerian study, mesioangular impaction was the most common type at 36.5%, followed by vertical impaction at 31.4%, and distoangular impaction was the least frequent at 15.8%.¹⁶ While according to Lina Alfadil in Saudi Arabia, mesioangular mandibular molars were 40.5%, vertical angulated were 32%, and horizontal were 23%.⁷

In our study, caries emerged as the most prominent reason for the extraction of third molars accounting for 64% of cases, followed by mobility, indicative of underlying periodontal disease, constituting the second most prevalent cause at 13%. Recurrent pericoronitis was the most common indication in Nepal, according to a study by Subedi S.; it was followed by caries at 11.7%, with 64.5% of patients exhibiting symptoms at the time of extraction.⁶

Moreover, studies conducted in developed countries like South Korea revealed a higher prevalence of pericoronitis being the major reason for extraction compared to our study. In South Korea, the prevalence of pericoronitis was 54%, while caries (10%) and periodontal disease (2%)

showed minimal incidence. Caries prevention is better observed in developed countries.¹⁷ A study conducted in Morocco, a developing country, showed a higher percentage of pericoronitis (21%) compared to our study. Half of the incidence of cases of caries (34.6%) and periodontal disease (4.9%) were reported there.¹⁸

In a study conducted in Belgium, periodontitis, periapical pathology, pericoronitis and caries, showed an increasing trend with age. This trend is similar to our study where prevalence of caries increases with age.^{13,19} The prophylactic removal of pathology-free impacted third molar teeth is not associated with any significant health benefits, as per the National Institute for Health and Care Excellence's (NICE) guidelines on third molar extraction. The NHS was instructed by NICE to stop extracting impacted third molars without any pathology as a preventive measure.²⁰

A growing body of research indicates that conservative treatment guidelines may ultimately have the opposite effect, increasing the extraction of third molars under adverse circumstances and at an older average age. This is consistent with our findings, which showed that the prevalence of caries rose with age. There is not much data comparing the preservation and routine management of impacted lower wisdom teeth with their preventative extraction.

However, prophylactic removal may be a more economical course of action, according to an exploratory assessment group model that examined the data on management of symptoms developed due to impacted third molars and extraction rates of impacted lower wisdom teeth.¹¹

In our population, prophylactic third molar extraction is not common. Most teeth (91%) extracted have underlying pathologies like caries, pericoronitis, or periodontal problems. In our country, patients usually present to the hospital when they are experiencing some kind of discomfort like pain, swelling, or difficulty in eating. A study done in Karachi by Iqbal et al. also showed that prophylactic extraction of wisdom

teeth is not common in Pakistan. They found out that 98% of third molars that underwent extractions were symptomatic, that is similar to our study.²¹ However, prophylactic extractions are common in Saudi Arabia. According to Lina Alfadil et al. 67% of extracted wisdom teeth were asymptomatic, while 33% were symptomatic.⁷

The majority of the research that were analyzed showed that 50% or more of cases had untreated caries. This incidence varied between continents, with Asia and Africa having the greatest rates and Australia exhibiting the lowest prevalence. Dental caries is a preventable disorder for which there are a number of available preventive methods. Therefore, it is imperative to expand oral health promotion and educational programs to include everyone throughout life.^{22,23}

CONCLUSION

People of age 18-40 mostly underwent third molar extraction. Foremost reason for extraction was dental caries. In the younger age group, pericoronitis was more common, whereas in the older age group, mobility was more common. Prophylactic extraction is not common in our practice.

Limitations: The primary limitation of this study is its retrospective nature, leading to the unavailability of certain essential information. Additionally, it is a single-institutional study.

Recommendations: Further prospective research, encompassing multiple tertiary hospitals across the country, should be conducted. The identification of preventable causes for third molar extraction underscores the importance of promoting fluoride use and oral hygiene measures within the community.

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Author Contributions:

Tooba Saeed: conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

Nabeela Riaz: Participated in its design and coordination. drafted, read and approved the final manuscript.

Samreen Younus: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

All authors are equally accountable for research work

Saba Hanif: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

Hammad Latif: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

Rana Zeerak: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

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