



ORIGINAL ARTICLE

Frequency and causes of extraction of first permanent molar tooth in patients presented to a teaching hospital, Multan.

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ABSTRACT... Objective: To know the frequency and causes of extraction of first permanent molar tooth in patients presented to a teaching hospital, Multan. **Study Design:** Retrospective Cross Sectional Descriptive study. **Setting:** Dental Outdoor Department of Ibn-e-siena Hospital. **Period:** July 2019 to September 2021. **Material & Methods:** Patients between the age of 5 years to 15 years, Age, gender, fate of the first permanent molar and the cause of decay of first permanent molar were recorded. **Results:** Out of 4200 patients 490 patients have decayed first permanent molar. Majority of the children were below 10 years with mean age was 8.6 ± 0.5 . Caries was the most frequent cause of decay. **Conclusion:** It can be concluded from the study that rate of extraction of first permanent molar is quite high and it is mostly due to caries and periodontal disease. It is mostly in children below ten years of age and has almost equal gender distribution.

Key words: Caries, Extraction, First Permanent Molar, Periodontal Disease.

INTRODUCTION

Teeth are very important in one person's life as these have many functions like mastication, role in speech and digestion and occlusion. At the age of 6 years, eruption of the permanent dentition starts and is completed at the age of 21 years of age.¹ Permanent teeth should be preserved as these are not replaceable and only way to replace them is with artificial means.¹ Tooth loss has many effects on individual's life which include masticatory dysfunction, temporomandibular pain dysfunction syndrome and psychological issues. Though it is said that teeth loss is declined but it is still very common especially in developing countries.²

Teeth loss may due to many reasons, these include caries which is the most common, Molar Incisor Hypo mineralization, periodontal diseases, trauma, root canal failure, mal occluded teeth and impacted teeth.¹ Tooth extraction is declining due to increased awareness of dental issues and

improved oral hygiene in the developed world like America and United Kingdom. But in Pakistan, it is still very common.^{2,3}

The most caries prone tooth is first permanent molar tooth. One study showed that in 43% of children in United Kingdom experienced caries and 10-19% had molar incisor hypomineralisation.⁴ Those teeth which are in bad condition and cannot be restored with conservative treatment are better to be extracted. But the time for extraction is important, as it has many effects, like if teeth are extracted before the age of 8 years, it may result in distal drifting of second premolar and mal rotation of second permanent molar even before eruption as well as poor occlusal relationship with upper molars. In contrast, if extraction is delayed, it will result in problems in space closure, which in turn lead to complain of food impaction, localized periodontitis, caries and other issues.⁴

So the aim of the study was to know the frequency

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and causes for extraction of first permanent molar. As teeth are very important in human life, so it is important to keep a close eye on the eruption pattern and timing in children and parents should be given awareness about the eruption timing of first permanent molar tooth as it is most caries prone tooth. Extraction of the tooth is a painful procedure and has potential complications which can be avoided by timely treatment of carious tooth and with the help of various treatment measures (restoration or root canal therapy) teeth can be preserved. Even the extraction of first permanent molars might be considered as the therapy of choice in teeth with poor prognosis (extensive caries or restorations, apical pathosis, failed endodontic treatment, patient compliance issue, financial restraints or molar incisor hypo mineralization).

MATERIAL & METHODS

This was a retrospective cross sectional descriptive study conducted in dental outdoor department of Ibn-e-siena hospital after taking ethical approval from the hospital ethical committee; reference number Publi/9/21. The data of the patients presented to the dental outdoor of Pedodontics department, between July 2019 to September 2021 was evaluated. Data was entered in the predesigned proforma. Inclusion criteria was Patients between the age of 5 years to 15 years, patents referred for extraction of 1st permanent molars due to caries, hypominerlization and other causes, all other teeth present (confirmed on OPG) and patients with class 1 occlusal relationship. While the Patients with incomplete record, extraction of teeth other than first permanent molar or extraction of first permanent molar as part of orthodontic treatment were excluded from the study. Age, gender, fate of the first permanent molar and the cause of decay of first permanent molar were recorded.

Data was entered and analyzed by using the SPSS 22. Numerical values were measured by mean and standard deviation. Qualitative variables by using frequency and percentage. Chi square test was used to know the significance and p value of ≤ 0.05 was considered as significant.

RESULTS

A total of 4200 patients presented to pediatric dental out door department between July 2019 to September 2021. Out of these 490 patients have decayed first permanent molar. The fate of first permanent molar is shown in the figure below.

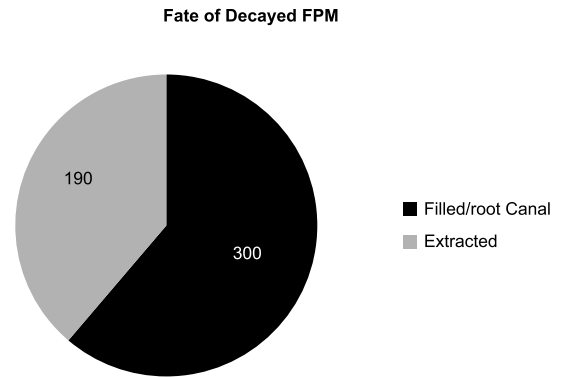


Figure-1. Treatment done for decayed first permanent molar.

Age distribution of patients with decayed first permanent molar is shown in the table below. Majority of the children were below 10 years with mean age was 8.6±05 as it can be seen from table.

Age Group (yrs)	Decayed	Filled/RCT	Extracted
5-10	301 (61.42%)	210 (42.85%)	101 (20.61%)
11-15	189 (38.58%)	90 (18.36%)	89 (18.16%)
Total	490 (100%)	300 (61.22%)	190 (38.78%)

Table-I. Age Group distribution in decayed FPM patients. (P 0.06)

When patient who underwent extraction were seen with respect to gender, following results were obtained.

Gender	Extracted
Male	98(51.58%)
Female	92(48.42%)

Table-II. Gender distribution of patients with extraction of FPM (P 0.081)

Various causes that lead to extraction of first permanent teeth was also noted and found to be

as follow. When compared these causes caries was significantly more common with p value of 0.04.

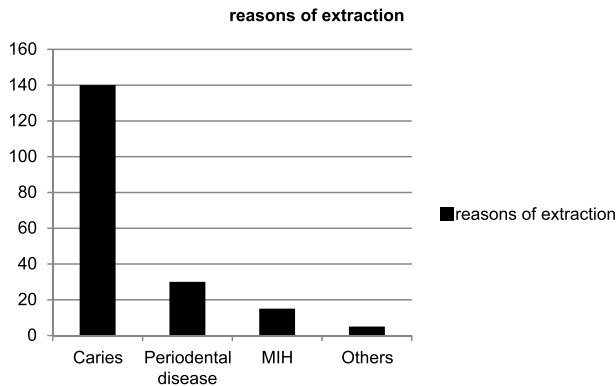


Figure-2. Different causes that lead to extraction of FPM

DISCUSSION

Dental extraction is a process in which tooth is extracted along with its root from its socket, also called exodontia. It may be due to many causes, which include pain, caries, periodontal disease, molar incisor hypo mineralization, trauma, failed endodontic therapy, apical pathosis, cyst or tumor of jaw and retained teeth.^{5,6}

In current study 8.57% patients have compromised first permanent molar. Out of these 490, 38.78% (190) extraction of the first permanent molar. Rukh et al showed that 86.25% patents with compromised first permanent molar got extraction of first permanent molar which is very high compared to current study.² Another study from Singapore showed 21.31% rate of extraction of permanent molar which is lower compared to present study.⁷

In the present study the majority of patients underwent extraction of first permanent molar due to caries followed by periodontal disease. The findings are in agreement with the results of previous studies in which it is reported that caries is the major cause for extraction of permanent teeth. As shown by Angelillo et al from Italy that caries and periodontal disease is the cause of extraction of nearly two third of cases of extraction of permanent teeth.⁸ Similar results were reported by Mhahjan et al.⁹ Other causes for extraction in the

present study was periodontal disease followed by molar incisor hypomineralization which is also in agreement with previous studies.^{1,3,4}

The most of the extractions were done in children below 10 years of age. A study by Eichenberger et al from Switzerland showed that extraction at the age of 8-10.5 years have better clinical response and spontaneous resolution compared to other age group age groups.¹⁰ In current study there was almost equal number of male and female patients who underwent extraction of the first permanent molar and there was no significant difference between two groups with p value of 0.08. Almugla also reported that there is no gender difference in the extraction of first permanent molar.¹¹

Much effort is put in to know the exact and appropriate time for extraction of first permanent molar, so that good clinical outcome can be achieved and complications can be avoided. Findings from the previous studies are as follow: Afnan et al showed that best time to extract first permanent molar is when second permanent molar is at bifurcation stage (age limit 8 to 10 years), so that it can fill the space of extracted first permanent molar.¹² One study from Switzerland showed that 8.5-10 years of age is the ideal time for extraction of first permanent molar.¹⁰ In contrast to these studies one study showed that there is no significant evidence of ideal or optimal time for extraction of first permanent molar.¹³

It can be concluded from the study that rate of extraction of first permanent molar is quite high and it is mostly due to caries and periodontal disease. It is mostly in children below ten years of age and has almost equal gender distribution. Parents should be given awareness about the eruption timing of first permanent molar tooth as it is most caries prone tooth so that early identification of caries and appropriate treatment (Pit and fissure sealants, Preventive resin restoration, Endodontics in compromised teeth) can be undertaken. Even the extraction of first permanent molar can be considered as the therapy of choice in grossly carious teeth, teeth with extensive restorations and the emphasis is

on ideal timing of extraction (8 to 10 years when second permanent molar bifurcation is forming and all teeth present on Orthopantomogram and in class 1 occlusion.) Single center retrospective study with small, sample size were the limitation of study, so results cannot be generalized.

CONCLUSION

The extraction of first permanent molars should be planned (if required) in collaboration with Pedodontics, Orthodontist and Maxillofacial surgeon. Different inter maxillary as well as intra maxillary variables must be taken in account as well as the concept of balancing and compensating extraction (in class 1 relationship) when planning extraction of first permanent molar. It is recommended to extract first permanent molar before the eruption of second permanent molar to reduce unwanted side effects and to achieve best functionally accepted occlusion.

LIMITATIONS

Single center retrospective study with small sample size, so results cannot be generalized.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Rabia Zafar	Study design, data collection, writing the manuscript, formulation of tables statistical analysis reviewed and approval.	<i>Rabia zafar</i>
2	Jaffar Hussain Bukhari	Study design, Statistical analysis, result interpretation, mansucrypt writing and revising it critically for important intellectual content.	<i>Jaffar Hussain</i>
3	Zoya Maryam	Data collection, formulation of tables reviewed and approved the manuscript, Statistical analysis interperataion of results, Reviewed and approved the manuscript.	<i>Zoya Maryam</i>
4	Muhammad Athar Khan	Study design, data collection, writing the manuscript, formulation of tables reviewed and approved.	<i>M Athar Khan</i>
5	Sabba Rehman	Study design, Statistical analysis, result interpretation, mansucrypt writing and revising it critically for important intellectual content.	<i>sabba Khalid</i>
6	Basil Khalid	Study design, data collection, writing the manuscript, formulation of tables reviewed and approved.	<i>Basil Khalid</i>