

Most Frequently Extracted Primary Tooth in Mandibular Arch of Children - A Retrospective Study

Priyadharshini Suresh Babu¹, Geo Mani²

¹Research Associate, Reader, Department of Pedodontics and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai

Abstract

The goal of Pediatric dentistry is to preserve the primary teeth. Extraction of primary teeth is one of the most frequent procedures which has to be performed in pediatric clinics. The common cause of extraction includes dental caries followed by dental trauma. Other causes include the diseases involving the periapical tissues. Knowing the prevalence or most commonly extracted tooth can help in establishing essential preventive strategies. Hence, the aim of the present study was to analyse the frequently extracted primary tooth in the mandibular arch of children. The study was a retrospective study done under a University setting. The data collected by reviewing and analysing 7415 patients records who visited the university hospital during the time period of June 2019 to March 2020. Inclusion criteria was children who underwent single and multiple extractions of mandibular primary teeth. A total of 1169 case records were collected, tabulated and entered in excel. Using SPSS software the data was subjected to descriptive statistics and Chi-square tests. Prevalence of boys who underwent extraction was 54%. Extraction was more prevalent in the age group of 7-12 years. The most frequently extracted primary tooth in the mandibular arch of children based on the study was the mandibular left first primary molar which accounts for 19.9%. From the data obtained, the study concludes that the most frequently extracted primary tooth in children is the left first molar and found to be predominantly in boys.

Keywords: Extraction - Primary Tooth - Mandibular Arch - Children- Dental Caries.

Introduction

Pediatric dentistry is better termed as age defined speciality that includes all the dental procedures. Pediatric dentistry deals with children from birth till adolescence period includes treatment for differently abled children and focuses on providing preventive and preservational care.¹

The primary teeth play an important role in the dentition of the child. Deciduous teeth are unsuitably referred to as “Temporary Teeth”. Primary tooth acts as a guide to permanent dentition in their optimal position, occlusion and is responsible for esthetics, functions of mastication, phonetics.² Primary teeth play an imperative role in the self-esteem of the preschool children.³ Children’s lives are greatly influenced by their parents. Parent’s knowledge and belief play an important role in the child’s oral health and maintenance. Teaching and guiding the child about the oral habits in their early childhood will prevent complications in future.

The oral health of the primary dentition should be taken care of with utmost attention by the parents and children. Dental neglect is defined as parents’ persistent failure to take precautions and provide necessary dental treatment to maintain the child’s oral health and to

Corresponding Author:

Geo Mani

Reader, Department of Pedodontics and Preventive Dentistry, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical sciences, Saveetha University, 162, Poonamallee High Road, Chennai-600 077, Tamil Nadu, India.

Email Id: geomani.sdc@saveetha.com

Contact Number: +91-7358433246

ensure their freedom from pain and infection.⁴ As the children are more suspected of dental problems, if left untreated and will affect the future permanent dentition. For example premature loss of the teeth affects the child's nutrition, self-confidence, growth, sleep and leads to malocclusion of permanent dentition. Can be due to reduced arch length required for succeeding teeth which predisposes to crowding, rotation, midline shift, impaction of permanent teeth.⁵

Conservative and endodontic treatments are advised when the pulp has the ability to recover when the cause for irritation is removed.⁶⁻¹⁰ When endodontic procedures are no longer applicable for treatment, extraction of teeth is done to avoid further complications. And space maintainers are given to prevent malocclusion problems further in permanent dentition. So the extraction is one of the frequently done procedures in dental Pediatric clinics.

There are various causes that lead to the extraction of the primary tooth. Out of which the extraction done due to dental caries accounts for the predominant cause.¹¹ As dental caries is considered a complex process of demineralization and dissolution of the substance of the teeth leading to cavitation. The etiology is multifactorial and involves initiation and progression of caries. Increased risk of caries can occur due to decreased fluoridation.¹²

Early childhood caries is a common problem encountered in children. One of the chronic diseases which is prevalent and affects life in different aspects.¹³ The caries are virulent and are seen to begin in early life soon after dental eruption. The caries develop on smooth surfaces and progresses rapidly. There is high probability of subsequent caries to occur in permanent dentition.^{14 15} Thick labial frenum contributes to plaque accumulation which turns to caries this occurs due to difficulty in cleansing the area.¹⁶

Premature eruption of the permanent tooth without the shedding of the primary tooth is also a major cause. That signifies the reason that extraction is mainly carried out in the mixed dentition period for most of the children. Extraction is also done as an interceptive treatment in children to prevent malocclusion as part of orthodontic treatment.¹⁷ Other causes for extraction include trauma, failure of the pulp, Periapical problems,

Congenital disorders, ectopic eruption of permanent tooth specifically the permanent first molars.^{18 19}

The aim of the study was to analyse the frequently extracted primary tooth in the Mandibular arch of children.

Material and Methods

Study Setting:

The present study is a retrospective cross sectional study which includes patients who visited an University hospital in Chennai, Tamil nadu. The present study was ethically approved by the Institutional Ethical Committee. (SDC/SIHEC/2020/DIASDATA/0619-0320). The study was carried out on children who visited the Department of Pediatric and Preventive Dentistry during the time period of June 2019 and March 2020 and had undergone the treatment of extraction in the lower arch. The pros of the study accounts for a large sample size and availability of reliable data which can be cross verified from patient radiographs and clinical pictures.

Sampling:

The study is a retrospective study with adequate internal and external validity. The data was acquired by reviewing and analysing 7415 patient records who underwent treatment in the Department of Pediatric and Preventive Dentistry during the time period of June 2019 to March 2020. The sample included patients under the age group of 0 to 15 years. Sample size was 6344 children. Inclusion criteria was children who underwent single and multiple extractions of primary teeth in the mandibular arch and also case sheets which were completely filled. Differently abled children and children with other systemic conditions were excluded from the study. Also case sheets which were incomplete and partially filled were excluded. Sampling bias was avoided by including all cases with a history of extraction meeting the inclusion criteria. The final sample size of 1169 patients. Any gross data which had the possibility of bias and could affect the studies was not included. All the data collected was cross verified by photographic and radiographic examination

Analysis :

The data was entered and tabulated in excel. The

data tabulation in excel was according to S.no, PID, Age, Gender, Extracted tooth. The data was then transferred to Statistical Package for Social Sciences (SPSS version 20) software and analysed. The data obtained was subjected to descriptive statistics and chi square tests. Frequency tables, cross tabulation tables were derived. The data was represented by the means of bar graphs. Results were correlated and associated. p value of <0.05 was considered to be significant.

Results and Discussion

The study evaluated the patients who had undergone treatment for extraction of primary teeth in mandibular arch. The total number of patients included in the study were 1169 patients. All the patients had visited the Department of Pediatric and Preventive Dentistry. The patients underwent extraction treatment for various causes like pain, caries, trauma, orthodontic treatment, periapical problems.

Among the study sample, the number of boy children were 629 out of the total 1169 patients and girl children were 540 out of 1169 patients. Boys (53.8%) underwent more extraction procedures compared to girls (46.2%) (table 1) (figure 1).

The age range of the study was patients under 15 years. Based on the data collected the age group was categorised as age group 0-3 which includes 11 patients, age group 4-6 which includes 193 patients, age group 7-12 which includes 906 patients, age group 13-15 years which includes 59 patients. The common age group for extraction was found to be 7-12 years. The mean age group was found to be 8 years. The prevalence of extraction in the 0-3 age group was 0.94%, 4-6 years was 16.5%, 7-12 years was 77.5% and 13-15 years was 5.05%. (table 2).

The primary teeth in the lower arch was notated in FDI system. The frequently extracted tooth in the lower arch is the primary molars (77.5%) out of which (19.93%) are the left first molars which are 233 in number followed by 230 right first molar (19.6%), 225 left second molar (19.2%) and 218 right second molar (18.6%) (table 4) (figure 2).

The study reveals that extraction carried among the boys was higher compared to that of girl children.

Increased tendencies of dental trauma are seen among males in the society²⁰. Occurrence of trauma in the primary dentition is common in the age group of 2-4 years. Preschool going children are indulged in various physical activities which induce traumatic injury because in that particular age there is lack of motor coordination.²¹ Development of ranula occurs due to trauma or obstruction of salivary gland.²²

In comparison with previous literature, (Mohammed A et al) states a similar evidence that extraction is more common in male who were presented with poor oral hygiene which denotes their carelessness and ignorance in maintaining good oral hygiene.²³ Whereas

(Chukwunke F et al) states a different evidence that extraction is more common in females as they are more conscious about their health related issues than males.²⁴

Parent's observance and care of dental health of children is very essential. Proper periodic tooth brushing and supervision of a child's healthy diet and nutrition plays an important role in maintaining oral hygiene.²⁵ The prevalence of extraction in the 0-3 age group was 0.94%, 4-6 years was 16.5%, 7-12 years was 77.5% and 13-15 years was 5.05%. Children belonging to age group 7-12 years were more in a number a total of 906 patients (77.5%) compared to other age groups. The study reveals that extraction is common among the age group of 7-12 years. That is due to the fact the mixed dentition period occurs during this age group.^{26 27}

In comparison with previous literature, (Mohammed A et al) states a similar evidence as the percentage of extraction was greater in the age group between 6-8 years and 9-11 years as the shedding time of primary teeth is between 7-12 years.²³ (Demiriz et al) provides similar evidence that extraction is common in 10 years of age as the children are in the mixed dentition period which makes it difficult to provide good oral hygiene.²⁸

In the left arch of the mandible 36 central incisors (3.08%), 36 lateral incisors (3.08%), 56 canine (4.79%), 233 first molars (19.93%), 225 second molars (19.2%) were extracted. In the right arch of the mandible, 40 central incisors (3.42%), 40 lateral incisors (3.42%), 55 canine (4.7%), 230 first molars (19.67%), 218 second molars (18.65%) were extracted. The study reveals that lower primary molars are the frequently extracted tooth

which is followed by secondary molars.(table 3)

Poor dexterity and difficulty in accessing the tooth brush in the posterior region accounts for food accumulation and plaque accumulation in this region. This paves way for the streptococcus mutans and colonizes the occlusal fissure areas and develops to caries. When the caries are left untreated the pulp of the tooth becomes necrotic. In case of pulpectomy failure, extraction procedure is carried out.^{29 30}

In comparison with previous literature, (Samuel S et al) (Azodo CC et al) states a similar evidence that primary molars are the frequently extracted tooth due to the fact that the last primary teeth to be shed is second deciduous molar and earliest permanent teeth to erupt is the first

permanent molar hence subjected to dental caries.^{31 32} . (Mukhopadhyay et al) states a similar evidence that primary first molars are the frequently extracted tooth as the success rate pulp therapy treatment done in first primary molars is low.³³

Extraction is a common procedure performed in the Pediatric Dentistry. Early diagnosis and treatment helps to prevent extraction procedures and improve the quality of life of the patient. The study helped in identifying that the posterior teeth were frequently extracted and a healthy diet ,nutrition and proper brushing techniques is to be followed to maintain a good oral hygiene which prevents complications. The limitation of the study includes that it is a single centered study that does not represent ethnic groups.

Table 1: Depicts the frequency distribution of the gender predilection of the children who underwent extraction procedure. Boys (53.8%) underwent more extraction procedures compared to girls (46.2%).

Gender	Frequency	Percent
Boys	629	53.8
Girls	540	46.2
Total	1169	100

Table 2: Depicts the frequency distribution of the age of the patients who have undergone extraction. Higher incidence of extraction was noticed in age group of 7 to 12 (77.5%)

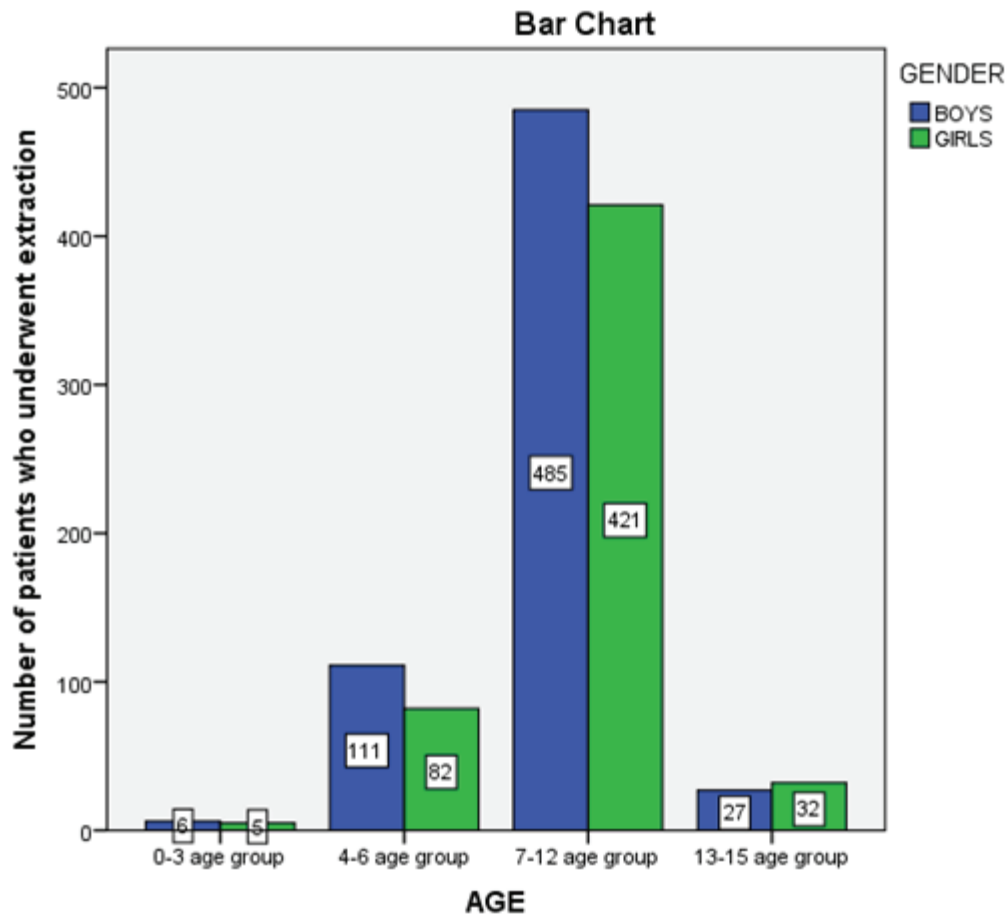
Age Group	Frequency	Percent
0-3 age group	11	0.9
4-6 age group	193	16.5
7-12 age group	906	77.5
13-15 age group	59	5
Total	1169	100

Table 3: Depicts the frequency distribution of the frequently extracted primary tooth in the mandibular arch of children. Higher incidence of extraction was found in Mandibular left primary first molar with 19.9%.

Extracted lower primary tooth	Frequency	Percentage
Extraction of 71	36	3.1
Extraction of 72	36	3.1
Extraction of 73	56	4.8
Extraction of 74	233	19.9
Extraction of 75	225	19.2
Extraction of 81	40	3.4
Extraction of 82	40	3.4
Extraction of 83	55	4.7
Extraction of 84	230	19.7
Extraction of 85	218	18.6
Total	1169	100

Table 4: Shows the association between the type of primary teeth extracted in mandibular arch (shown in FDI system of notation) and different age groups. Higher number of extractions was seen in the age group of 7-12 years. Chi square test was done and p value was found to be 0.00 (p value < 0.05, statistically significant).

AGE	EXTRACTION OF PRIMARY TOOTH										TOTAL	P VALUE
	71	72	73	74	75	81	82	83	84	85		
0-3 age group	3	1	0	2	0	3	2	0	0	0	11	0.000
4-6 age group	8	9	3	43	29	11	7	1	48	34	193	
7-12 age group	24	25	49	184	179	26	30	50	177	162	906	
13-15 age group	1	1	4	4	17	0	1	4	5	22	59	
TOTAL	36	36	56	233	225	40	40	55	230	218	1169	



Figure

1:Depicts the association between age group and gender in children undergoing extraction. X-axis represents the age group of patients based on gender as boys (blue), girls (green). Y-axis represents the number of patients who underwent extraction. There was no difference between the number of teeth extracted between boys and girls at different age groups. Chi-square test was done and the p value was found to be 0.452 (p value > 0.05, statistically not significant).

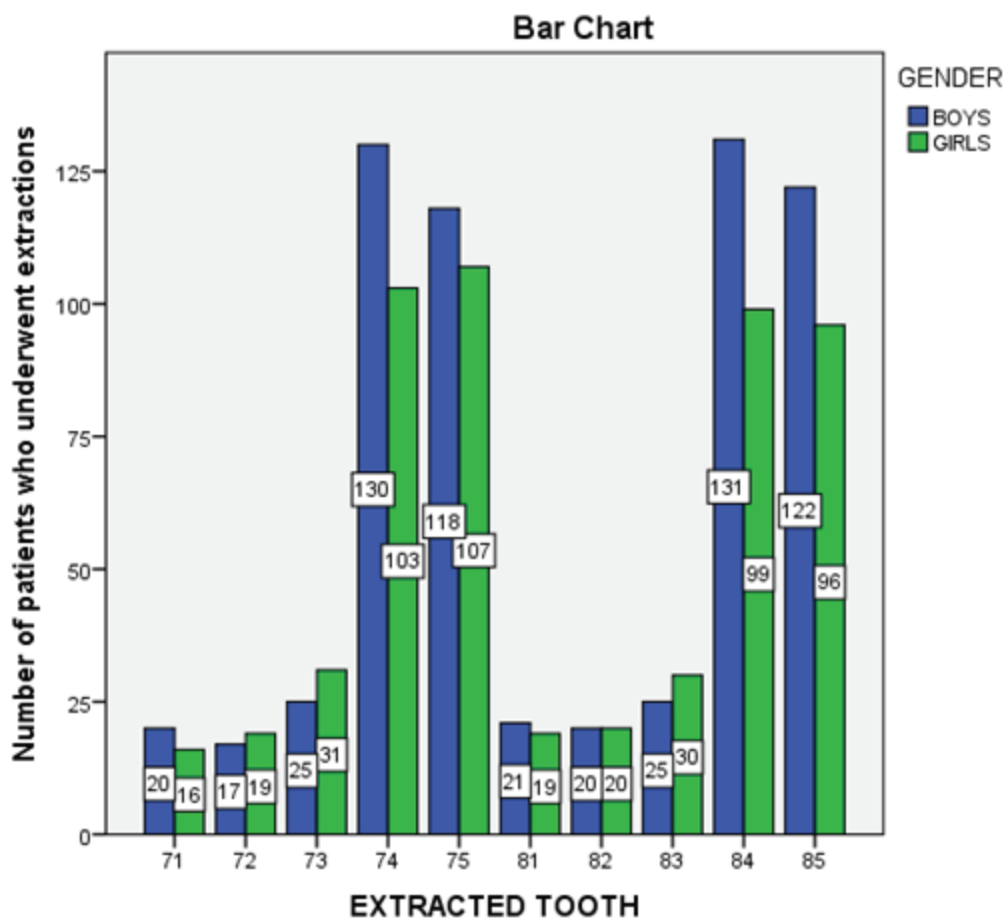


Figure 2: Depicts the association between type of tooth extracted and gender. X-axis represents the frequently extracted tooth in the FDI system of tooth notation) based on gender as boys (blue), girls (green). Y-axis represents the number of patients who underwent extraction. There was no difference between boys and girls and the type of teeth extracted. Chi-square test was done and the p value was found to be 0.716 (p value > 0.05, statistically not significant).

Conclusion

Within the limits of the study we conclude that the most frequently extracted primary tooth in the mandibular arch of children is the primary left first molar and is carried out predominantly in boys under the age group of 7-12 years.

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Conflict of Interest: There is no conflict of interest.

Ethical Clearance: It is taken from “Saveetha Institute Human Ethical Committee” (Ethical Approval

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