Pulpectomy In Mandibular Ist and IInd Primary Molars with Distal Caries

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ABSTRACT

Pulpectomy is a root canal procedure for pulp tissue which is irreversibly inflamed or necrotic. The root canals are debried, cleaned and shaped and obturated with resorbable materials. It prevents the premature loss of primary teeth. The aim of this study is to evaluate the pulpectomy procedure done in mandibular primary molars with distal caries who visited Department of Pedodontics. A retrospective study was carried out in patients who visited Saveetha Dental College. The data were collected from patients records between July 2019-March 2020. The collected data were entered in an Excel sheet and subjected to statistical analysis using SPSS software. The results has shown that 4&6 years old children (35% and 40%) have highly undergone pulpectomy procedures. About 55% mandibular second primary molars are mostly affected with distal caries and underwent pulpectomy. The study concludes that mandibular 2nd primary molars are highly affected with distal caries. Early detection of caries can prevent premature loss of teeth and provide excellent prognosis

KEY WORDS: DENTAL CARIES; MANDIBULAR PRIMARY MOLAR; NECROTIC PULP; ORAL HEALTH; PULPECTOMY.

INTRODUCTION

Oral health plays an important role in the general wellbeing of individuals and parents behaviour and attitude influences the oral health of their children. Dental caries is a complex process of demineralisation and dissolution of the substance of the teeth leading to cavitation. It is a multifactorial disease with *Streptococcus mutans* is the major contributor in the development of dental caries. Use of fluoride toothpaste reduces dental caries in school aged children and also associated with dental fluorosis (Wright et al., 2014; Somasundaram et al., 2015; Gurunathan and Shanmugaavel, 2016; Subramanyam et al., 2018; Joshi and Dixit, 2018; Nikita et al., 2021).

Pediatric endodontics is an important part in dental practice which aims to preserve the function of primary teeth. Pulp therapy in primary dentition is complex and

challenging topic which involves numerous procedures and use of different materials. An efficient chemomechanical preparation is essential for effective canal disinfection and contributes to the success of the endodontic procedure. The goal of root canal therapy is the elimination of infected tissue and prevention of apical tissue. The Main objective of pulp therapy in the primary dentition is retain every primary tooth as fully functional component in dental arch. This helps in proper mastication, phonetion, swallowing, preserving space for permanent teeth and prevents the psychological effects due to tooth loss. Two types of pulp therapy are pulpotomy and pulpectomy. Pulpotomy means surgical removal of the entire coronal inflammation of pulp and leaving vital radicular pulp intact within the canal. In case of irreversibly inflamed and necrotic radicular canals, pulpotomy procedures cannot be done (Razi, 1999; Dummett, 2002; Ounsi et al., 2009; Govindaraju, 2017a; Govindaraju, 2017; Nagaveni et al., 2018; Panchal et al., 2019; lakshmi et al., 2021)

Pulpectomy is a conservative treatment approach to preventing the premature loss of primary teeth that can result in loss of arc length, insufficient space for erupting permanent teeth, impaction of premolars and mesial tipping of molar teeth. The retained molar can act as functional components in dental arch. An appropriate pulpectomy of primary molars rather than extraction is reasonable treatment

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option to ensure either normal shedding, eruption of the successor or long-term survival. The premature loss of each primary tooth led to an 18% increase in the orthodontic treatment need in the permanent dentition (Berk and Krakow, 1972; Ahmed, 2013; AL-Attiya et al., 2021).

Primary teeth play an imperative role in the self-esteem of the pre-school children and also plays a pivotal role in speech development, esthetics and function. Primary mandibular first molars usually have two roots and three root canals and the format of accessory roots is uncommon sometimes. It has four root canals. Primary mandibular second molars have two roots and three root canals with formation of accessory roots is uncommon. The occurrence of an extra distal root in these molars is rather considered a racial characteristic of certain native Indian and mongoloid population. Untreated carious teeth, carious pulp involvement, pulpotomy, pulpectomy lead to higher occurrence of IRR in primary teeth (Liu et al., 2010; Mokhtari et al., 2013; Ravikumar et al., 2017; Musale et al., 2021).

Previously our team has a rich experience in working on various research projects across multiple disciplines (Gheena and Ezhilarasan, 2019; Ke et al., 2019; Malli et al., 2019; Mehta et al., 2019; Samuel et al., 2019; Varghese et al., 2019; Venu et al., 2019; Vignesh et al., 2019; Jain et al., 2019; Jose et al., 2020; Krishnaswamy et al., 2020; Muthukrishnan et al., 2020; Samuel et al., 2020; Sathish and Karthick, 2020). Now the growing trend in this area motivated us to pursue this project. The aim of this study is to evaluate the pulpectomy procedure done in mandibular primary molars with distal caries. Accumulation of fat in the arterial walls also leads to atherosclerosis (Khalil et al., 2018; Al Amri et al., 2019; Alasnag et al., 2020).

MATERIAL AND METHODS

A retrospective study was carried out among young children reporting to the Department of Pedodontics. The study was conducted between July 2019-March 2020. The study population consists of young children who had distal caries in mandibular primary molars and underwent pulpectomy. Inclusion criteria includes patients underwent pulpectomy procedures in mandibular primary molars and distal caries. Exclusion criteria includes patients underwent pulpectomy procedures other than mandibular primary molars and class 1 caries, mesial caries and mesiodistal caries.

Ethical approval was obtained from the Institutional Ethical Committee and Scientific Review Board of Saveetha University SDC/SIHEC/2020/DIASDATA/0619-0320. The data were collected from patients records between July 2019-March 2020. The data comprises 20 patients who were reported with distal caries in mandibular primary molars and undergone pulpectomy. The data includes patient's age, gender, tooth number. The data collected were entered in an Excel sheet and defined for statistical analysis using SPSS software. A chi square test was between age and gender, age and tooth number and gender and tooth number. Independent variables

are age and gender while dependent variables are teeth numbers. The results were formulated in graphs.

RESULTS AND DISCUSSION

Controlling patient's anxiety adequately is an integral part in the practice of dentistry. Dental students aggravate patient's distress during dental procedures. Pulpectomy is procedure to preserve the primary teeth in symptom free state until they are replaced by successor naturally during transition period. It re-establishes the masticatory function, esthetics and also prevent the harmful tongue habits and speech alterations. Our aim in this study was to find out no of patients undergone pulpectomy in mandibular primary molars with distal caries. Out of 20 patients, 13 were males (65%) and 7 were females (35%) (figure 1). About 35 % and 40% were 4- and 6-years old patients were highly affected with distal caries and underwent pulpectomy (figure 2) (Aishwarya and Gurunathan, 2017).

Figure 1: Pie chart depicts the distribution of study population based on gender. It shows that more number of male patients (purple) (65.00%) were diagnosed with distal caries and underwent pulpectomy.

Based on age and tooth number distribution, pulpectomy undergone age is 4 & 6 years (35% and 40%) followed by 7 year (10%) and 3,5,8 years (5%). Among 4&6 years old patients, mandibular second primary molars (75-25%, 85-30%) are mostly affected and least affected is mandibular first primary molars. Association between age and teeth number found be statistically insignificant (figure 3).

Based on gender and tooth number distribution, most commonly undergone gender group is male about 65%. Among male patients, mandibular 2nd primary molars (75-25%, 85-15%) are most commonly affected with distal caries which was statistically insignificant (figure 4).

There are no previous studies for specific surface and specific teeth affected by dental caries. Another reliable research is included. A study done by Nagarathna et al

concludes that both the hand held lentulosprail and modified disposable syringe technique are effective in obturation of primary molars root canals. A study done by Divya et al concludes that Kedo-S pediatric rotary file system shows considerably better quality of obturation when compared to that of K3 rotary and hand K file systems. A study done by Ahsana et al concludes that Hand files produced more apical debris extrusion than ProTaper and Kedo-S files. A study done by Lavanya et al concludes that about 50% of the practitioners used rotary instrumentation of root canals in primary teeth. ProTaper was the commonly used rotary system in primary teeth CS-B (calcium silicone based) biomaterial, can be a reliable approach for the treatment of irreversible pulpitis of vital primary molars (Subramanian, 2017b; Vishwanathan et al., 2018; Divya et al., 2019; Asif et al., 2019; Asgary et al., 2021)

Figure 2: Bar chart showing the distribution of study population based on gender. X-axis represents age and Y-axis represents number of patients. From the graph we found that 4 & 6 (green colour denotes 4 and red colour denote 6) year old patients (35.00% & 40.00%) were highly diagnosed with distal caries and underwent pulpectomy.

Figure 3: This bar graph represents the association between age and teeth number among the study population. X-axis shows the age distribution and Y-axis shows the number of patients. Association between age and teeth number was done using Chi-square test (p value=0.474) and was found to be statistically insignificant. It shows that 4- & 6-years old patients had undergone pulpectomy mostly in mandibular second primary molars 75 (red colour-25%) & 85 (orange colour-30%) and least affected is mandibular first primary molars 74 (blue colour-10.00%) and 84 (green colour-10.00%).

A study done by Mebin et al concludes that the total occurrence of three rooted primary mandibular first molars is about 1.3%, most frequently supernumerary root located histologically. A study done by Ganesh et al concludes that The Kedo-S rotary file system and Kedo-S hand file system can be used as an effective tool for root canal preparation in primary teeth. A study done by Pramila et al concludes that RC Fill, Vitapex and Pulpdent were found to be effective root filling materials for primary molars with necrotic pulps and irreversible pulpitis. A study done by Dhanalakshmi et al., concludes that the prevalence of early loss of primary teeth was present predominantly in male children (54.64%) in comparison to female children (43.35%) which was statistically significant ($P = 0.03$). The most commonly affected were the mandibular teeth (58.63%), the most common tooth being the first molar (44%) followed by second molar (33%) (Pramila et al., 2016; Mathew and Soni, 2019; Jayachandar et al., 2019; Jeevanandan et al., 2019; Nikita et al., 2021).

Figure 4: This bar graph represents the association between gender and teeth number among the study population. X-axis shows the gender distribution and Y-axis shows the number of patients. It shows that male patients had undergone pulpectomy mostly in mandibular second primary molars 75 (red colour-25%) and 85 (orange colour-15%) are mostly affected and least affected is mandibular first primary molars 74 (blue colour-10.00%) and 84 (green colour-15.00%). Association between gender and teeth number was done using Chi-square test (p value=0.319) and was found to be statistically insignificant.

A study done by Ganesh et al concludes that Kedo-S rotary files was effective during root canal preparation of primary teeth with reduction in instrumentation time and better quality of obturation. A study done by Manisha et al concludes that least post-operative pain was found in Mtwo group followed by Kedo-S group and K-file group. in her study states that the most predominant pulp therapy procedure done was found to be the pulpectomy with a percentage of 90%. Failures reasons for failures of pulp treated primary teeth include: The incomplete coronal pulp tissue removal and in particular the poor seal at the proximal step by the final restoration whether it be an amalgam, composite resin or a stainless steel crown restoration (Nair et al., 2018;

Jeevanandan and Govindaraju, 2018; Kiran et al.,2021; Nikita et al.,2021).

Our institution is passionate about high quality evidence based research and has excelled in various fields (Pc et al., 2018; Ramesh et al., 2018; Ezhilarasan et al., 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree, 2019; Mathew et al., 2020). We hope this study adds to this rich legacy. The main limitation of this study is limited geographic location and confined to limited sample size. This can be corrected by conducting the study in different states, different universities.

CONCLUSION

Within the limitations of the current study, 4 & 6-year-old patients are highly affected with distal caries which leads to pulpectomy treatment. Mandibular second molar are most commonly affected. Early detection of caries can prevent premature loss of teeth and provide excellent prognosis. Adequate knowledge on root anatomical variations, usage of instruments, obturation techniques are essential prior to doing pulpectomy procedures in exfoliating or retained primary molars.

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