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Association of Age, Gender and Tooth Related Study on Patients Undergoing Endodontic Retreatment

Research Article

Harrita. S[1], Pradeep S[2*], Senthil Murugan P[3]

[1] Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.
[2] Reader, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.
[3] Associate professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.

Abstract

A procedure to remove root canal filling material from the tooth followed by cleaning shaping and obturating again is known as endodontic retreatment. The factor responsible for such endodontic failures may be microbes, intra radicular, extra radicular infections. The method of evaluation can be clinical, radiographic and histologic. The re endodontic treatment can be due to persistent lesion or pain, failed post and core, missed canal during obturation. The aim of the study is to evaluate the association of age gender and tooth related correction on patients undergoing endodontic retreatment. A university setup study where 86000 case sheets were reviewed and out of which 117 case sheets were obtained based on the inclusion criteria of the study, the data were collected from record management system of saveetha dental college. Collected data was compiled and statistically analysed using SPSS version 23.0. In this study patients with the age group of 18-30 years have undergone more endodontic retreatment, highest in maxillary anteriors followed by mandibular molars. Thus, we can contemplate that there is a significant association between age group and tooth involved in endodontic retreatment ($p<0.05$) and also between gender and tooth involved in endodontic retreatment ($p<0.05$). Within the limitations the age group of 18 to 30 years underwent most endodontic retreatment and teeth involved were maxillary anteriors. Endodontic retreatment was more commonly seen in males. This showed that young people undergo endodontic treatment early in their life and are in need of endodontic retreatment, main reason for endodontic retreatment is improper coronal seal with advent of newer technologies like CBCT, and dental operating microscopes one can assure successful endodontic treatment.

Keywords: Endodontic Retreatment; Maxillary Anteriors; Mandibular Molars; Re-Rct; Root Canal Retreatment.

Introduction

Root filled teeth persistent periapical radiolucencies are often classified as endodontic failures [1]. Non-surgical retreatment is an endodontic treatment procedure used to remove materials from root canal space and if present address deficiencies or repair defects that are pathology or iatrogenic in origin [2].

Root canal treatment usually fails when treatment fails short of acceptable standards [3-5].The reason many teeth do not respond to root canal treatment is because of procedural errors that prevent the control and prevention of intra canal infections [6].There has been massive growth in endodontic treatment in recent years. Necessary for this unfolding story is the general public's growing selection for root canal treatment as an alternative to the extraction. Over time, patients have become more confident selecting endodontic treatment because of the changing perception that pain can be managed, techniques have improved, and success is achievable. During the last decade, significant procedural refinements have created greater promise for our profession to fulfill the public's growing expectations for long term success. Endodontic retreatment varies in many respects from primary endodontic therapy. Among the differences is the fact that filling materials have to be removed from the root canals before the routine endodontic treatment may be performed. Also, a high percentage of the teeth that are indicated for retreatment have been restored, and the restoration has to be considered before retreatment can be initiated. The coronal restoration or the post and core can be removed or retained. Each such option is related to specific conditions and has its advantages and disadvantages. The treatment

***Corresponding Author**:
Pradeep S,
Reader, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.
Tel: +91 9710404482
E-mail: pradeeps@saveetha.com

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modalities which are available for removing filling materials from root canals also have clinical significance and should be selected carefully [7].

The necessity to remove filling materials from the root canals is one of the major differences between primary endodontic therapy and retreatment. The obturating material has to be removed from the root canals before routine, endodontic therapy can be performed. The removal of the material should not result in a change in the canal morphology, so that the objectives of endodontic therapy can be maintained [8]. Nevertheless there are some cases that follow the highest level of technical standards and yet fail. Factors that are included are microbial factors extraradicular and intra radicular infections, intrinsic or extrinsic non microbial factors [9-11]. On the basis of the praxis concept theory a technique was developed to assess and numerically express the inclination of dentists to propose endodontic retreatment. It was assumed that the disposition to retreat could be summed in a "retreatment preference score" (RPS)[12]. Kvist et al generated the praxis concept theory.It consists of periapical health and disease not as either or situation but as a state on a continuous scale. On this scale a major lesion represents a more serious one. The theory states the placement of the cut off basically is dependent on individual values but also on factors such as cost and quality of root filling seal and accessibility to root canal [13].Thus the aim of the study is to evaluate the association of age, gender and teeth that undergoing endodontic retreatment. Previously our team has a rich experience in working on various research projects across multiple disciplines. [14-28]. Now the growing trend in this area motivated us to pursue this project.

Materials and Methods

Study settings: This study is a university setting study conducted in Saveetha Dental College, Chennai. Approval from ethical committee was obtained. Two examiners are involved in this study.

Sampling: In this retrospective study, a total of 86000 case sheets were reviewed, out of which 117 data were collected from June 2019 and March 2020.Cross verification of data for errors was done by presence of additional reviewers and by photographs. Simple random sampling was done to minimize sampling bias. Study was generalised to the South Indian population.

Data collection: Data of patients who underwent endodontic retreatment procedure was collected from the record management system of the college. Data was entered in excel in a methodological manner and imported to SPSS.Incomplete data was excluded from study.

Analysis: IBM SPSS 23.0 software was used for data analysis. Independent variables include age, gender, tooth. Dependent variable is endodontic retreatment. Both descriptive and inferential statistics was done. Frequency distribution was done for age and gender in which endodontic retreatment was performed. Chi square test is done to find the association.

Result And Discussion

From this study, on analysing out of 117 patients records, the number of endodontic retreatment based on the teeth as follows: Maxillary Anteriors (56), Maxillary Premolars (9), Maxillary Molars (14), Mandibular Anteriors (5), Mandibular Premolars (8), Mandibular Molars (25). (Graph 1).

When association was done between age groups and endodontic retreatment, age group of 18 to 30 years (62), age group of 31 to 40 years (18), age group of 41 to 50 years (24), age group of 51 years and above (13) underwent endodontic retreatment. The most common teeth involved in endodontic retreatment was

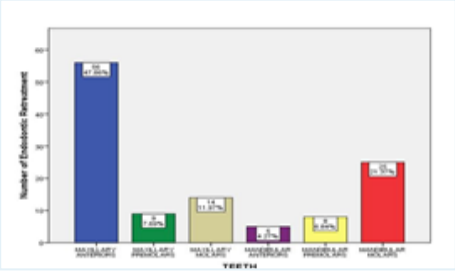
Table 1. Association between age groups and endodontic retreatment. On analysing the age groups, 18-30 years had more number of retreatments compared to other groups, where Pearson's chi-Square test shows significant difference p -value = 0.016. (p<0.05).

Age Groups	TOOTH						TOTAL	CHI SQUARE VALUE	P-VALUE
	MAXILLARY			MANDIBULAR					
	Anterior	Premolar	Molar	Anterior	Premolar	Molar			
18-30 YRS	31	4	6	4	0	17	62		
31-40 YRS	12	1	2	0	1	2	18		
41-50 YRS	10	3	3	0	6	2	24	28.94	**0.016**
>50 YRS	3	1	3	1	1	4	13		
TOTAL	56	9	14	5	8	25	117		

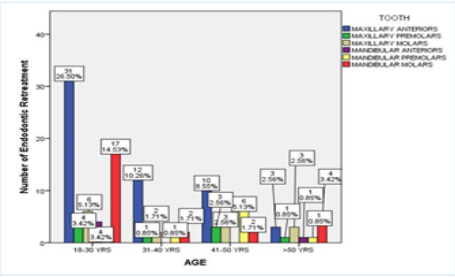
Table 2. Association between Gender and Endodontic retreatment. Male patients compared to female patients had undergone more endodontic retreatment in maxillary anterior teeth. Pearson's chi square test shows significant p-value of 0.007 (p<0.05).

Gender	TOOTH						TOTAL	CHI SQUARE VALUE	P-VALUE
	MAXILLARY			MAXILLARY					
	Anterior	Premolar	Molar	Anterior	Premolar	Molar			
MALE	31	0	10	4	2	12	59		
FEMALE	25	9	4	1	6	13	58	16.047	**0.07**
Total	56	9	14	5	8	25	117		

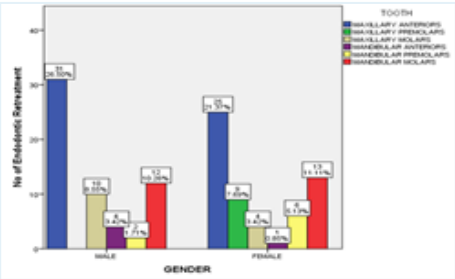
Graph 1: The above depicted graph shows frequency distribution of various teeth which have undergone endodontic retreatment. The X-axis denotes the tooth and Y-axis denotes frequency.



Graph 2: The above depicted graph shows association between age and number of patients who had undergone endodontic retreatment. The X-axis denotes the age and Y-axis denotes the number of patients who underwent endodontic retreatment. From this graph we infer that maxillary anterior teeth underwent more retreatment in the age group of 18-30 years (Blue). Pearson's Chi-Square test, p-value =0.016 (p<0.05), statistically significant.



Graph 3: The above depicted graph shows association between gender and number of patients who had undergone endodontic retreatment. The X-axis denotes the gender and Y-axis denotes the number of patients who underwent endodontic retreatment. Male patients compared to female patients had undergone more endodontic retreatment in maxillary anterior teeth (Blue), Pearson's Chi Square test, p-value was 0.07 (p <0.05); hence statistically significant.



maxillary anteriors in the age group of 18-30 years. Chi Square test showed a significant value of 0.016. (p<0.05) (Table 1) (Graph 2).

Also, 50.5% of male underwent endodontic retreatment and 49.5% of females underwent endodontic retreatment. In male patients the endodontic retreatment distribution as follows: maxillary anterior (31), maxillary molar (10), mandibular anterior (4) , mandibular premolar (2) ,mandibular molars (12) and in female patients the endodontic retreatment distribution as follows: maxillary anterior (25) ,maxillary premolar (9), maxillary molar (4) , mandibular anterior (11) ,mandibular premolar (6) , mandibular molar (13), maxillary anteriors underwent more endodontic retreatment followed by mandibular molars and other teeth in both the genders, Chi square test showed significant value of 0.007 (p<0.05) (Table 2) (Graph 3).

Endodontic failures can be attributable to inadequacies in shaping, cleaning and obturation, iatrogenic events, or re-infection of the root canal system when the coronal seal is lost after completion of root canal treatment. Regardless of the etiology, the sum of all causes is leakage and bacterial contamination Except in rare instances, lesions of endodontic origin will routinely heal following the extraction of pulpally involved teeth because the extraction not only removes the tooth, but more importantly serves to eliminate 100% of the contents of the root canal system. Endodontic treatment can approach 100% success discounting teeth that are nonrestorable, have hopeless periodontal disease or have radicular fractures [2]. Additionally, nonsurgical retreatment procedures confirm mechanical failures, previously missed canals or radicular subcrestal fractures. Importantly, disassembly and corrective procedures allow clinicians to shape canals and three-dimensionally clean and pack root canal systems. Nonsurgical endodontic retreatment procedures have enormous potential for success if the guidelines for case selection are respected and the most relevant technologies, best materials and precise techniques are utilized [29].

In the study it is observed that the males showed high dominance in the re-endodontic treatment with 50.5% this almost closer to a study conducted by kvist et al in his study for re endodontic treatment 62% were male. In the study it is observed that the age group of 18 to 30 years had undergone high number of re endodontic treatment this was in contradiction to a study by kvits et al where majority were of age group 41 to 50 years [13]. JF Siqueira et al states that non-microbial factors can also be the reason for endodontic failures and in some cases due to persistent intraradicular or sometimes extraradicular infections leading to re-endodontic treatment [30]. Stuart CH et al States that the persistent nature of

E-Faecalis can be the cause for endodontic failure; they also state that a newer approach for endodontic retreatment helps to overcome such scenarios [31]. Thus it is important to emphasize the importance of case selection, interdisciplinary treatment planning and the role of nonsurgical endodontic retreatment in preserving strategic teeth.

This study can be used as a base and the cons in the study are the small sample size limitation of population group to south Indian population this can be altered and done in large-scale. The in-*vitro* studies conducted at our university were [32-34], the in *vivo* studies include [35-37], molecular study includes [(33)]. The reviews and systematic review published are [(38),(39),(40)]. The surveys conducted were [41-42]. The clinical trials about root canal were [43-45, 31]. Currently we are analysing retrospective studies and in this study we have evaluated the frequency of endodontic retreatment amongst different age groups and gender. Our institution is passionate about high quality evidence based research and has excelled in various fields [46-56]. We hope this study adds to this rich legacy.

This study is of a shorter time frame with a limited population. So to ascertain the findings of our study, we have to do further studies in the future with larger sample size and longer duration. This can be helpful to find more information regarding the frequency of endodontic retreatment done and its efficacy based on age and gender.

Conclusion

Within the limitations the age group of 18 to 30 years underwent most endodontic retreatment and teeth involved were maxillary anteriors. Endodontic retreatment was more commonly seen in males. This showed that young people undergo endodontic treatment early in their life and are in need of endodontic retreatment, main reason for endodontic retreatment is improper coronal seal, with advent of newer technologies like CBCT, dental operating microscopes one can assure successful endodontic treatment.

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