

ASSESSMENT OF PATIENTS REPORTING FOR POST ENDODONTIC RESTORATION AFTER COMPLETION OF ROOT CANAL TREATMENT TO DENTAL HOSPITAL

KrishnaKanth Jaju¹ Iffat Nasim² J.Mahalakshmi³

¹*Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University Chennai, India.*

²*Professor and HOD Department of Conservative and Endodontics Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University Chennai, Tamil Nadu, India*

³*Senior Lecturer, Department of Conservative and Endodontics Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University Chennai, Tamil Nadu, India*

²iffatnasim@saveetha.com

ABSTRACT

Endodontically treated teeth are more prone to fracture compared to vital teeth. Clinical outcome of endodontically treated teeth is influenced by a variety of factors, tooth position in the arch, number of proximal or occlusal contacts, type of abutment, crown placement, amount of tooth structure loss due to caries, previous restorations or endodontic access, trauma, and periodontal status. The aim of the present study was to evaluate the number of patients reporting for post endodontic restoration after completion of root canal treatment to dental hospital. This is a retrospective study conducted during June 2020. Included patients who visited a dental hospital in Chennai, India from June 2019 - March 2020. Data of patients was collected from case records, tabulated into excel sheets under headings age, gender, teeth no, patients reported back for post endodontic restoration. Then data was analyzed using SPSS software (23.0 version). Statistical analysis of the data was performed using the chi square test. In the present study 66.2% of patients reported for post endodontic restoration, 33.8% of patients did not report back for post endodontic restoration. Failure to report back for post endodontic restoration was less in the present study. Being busy with other activities and long distance were some reasons given by patients who failed to report back for post endodontic restoration.

KEYWORDS:- Crown; Permanent restoration; Post endodontic restoration; Root canal treatment; Temporary restoration.

INTRODUCTION

Endodontically treated teeth are more prone to fracture compared to vital teeth. Clinical outcome of endodontically treated teeth is influenced by a variety of factors, tooth position in the arch, number of proximal or occlusal contacts, type of abutment, crown (Jose, P. and Subbaiyan, 2020), amount of tooth structure loss due to dental caries (Rajendran *et al.*, 2019), previous restorations or endodontic access, trauma (R, Rajakeerthi and Ms, 2019), and periodontal status. Root canal treatment (Ramamoorthi, Nivedhitha and Divyanand, 2015) involves the removal of necrotic and infected tissue (Ramanathan and Solete, 2015) followed by the provision of a well-condensed obturation to prevent further microbial proliferation within the root canal (Endodontology and European Society of

Endodontology, 2006). The potential ingress of microbes into the root canal compromises the outcome of endodontic treatment. The importance of an effective coronal seal in endodontics is well documented. Tooth fracture usually occurs when the endodontically treated teeth is not immediately or properly restored, which leads to unrestorable fracture or root canal retreatment due to coronal leakage (Mondelli *et al.*, 1980; Endodontology and European Society of Endodontology, 2006). Success rate of endodontically treated teeth with immediate permanent restorations is higher than those with long-term provisional restorations, especially in the posterior teeth with excessive loss of tooth structure (Trope and Ray, 1992; Hansen and Asmussen, 1993). Restoration of endodontically treated teeth is often considered as being distinct from root canal treatment. However, both are inseparable in planning, execution, and prognosis. The restoration of endodontically treated teeth is as important as the actual root canal obturation and has a profound effect in eliminating microorganisms, the primary cause of endodontic disease (Gillen *et al.*, 2011; Ng, Mann and Gulabivala, 2011). Therefore all dentists restoring endodontically treated teeth share responsibility to ensure that every phase of treatment is appropriate, well executed, and timely. Basic principles of restoring endodontically treated teeth are posterior teeth should receive crown. Bonded restorations, once thought to be needed for cuspal coverage, provide only short-term strength to teeth, according to recent studies. Anterior teeth with minimal loss of tooth structure can be restored with bonded restorations, preservation of tooth structure is desirable. According to Cohen classification for post endodontic restoration, tooth with minimal structural loss coronal restoration is sufficient, Teeth with more than 50% of remaining coronal structure are indicated to be restored with crown (Ravinthar and Jayalakshmi, 2018), Teeth with 25-50% remaining tooth structure can be restored with non rigid post and Teeth with less than 25% of remaining tooth structure to be treated with rigid post. Failure to keep dental appointments reduces patient care. While failure to keep appointments can result in poor prognosis, economic cost and patient care disruption. The aim of the present study was to evaluate the number of patients reporting for post endodontic restoration after completion of root canal treatment to dental hospital.

MATERIAL AND METHODS

This is a retrospective study conducted during June 2020. Included patients who visited a dental hospital in Chennai, India from June 2019 - March 2020. This study was approved by the Institutional Review Board, ethical approval number is SDC/SIHEC/2020/DIASDATA/0619-0320. Inclusion Criteria - Patients above 18 years of age, patients who visited during a particular time period from June 2019 - March 2020 and patients reporting for post endodontic restoration. Exclusion Criteria - Patients below 18 years of age, patients who did not visit during a particular time period from June 2019 - March 2020 and patients who reported to hospital with any other complaint. Data of the patients reporting for post endodontic restoration and root canal treatment was collected from case records. 1483 patients met the inclusion criteria out of which only 981 patients reported for post endodontic restoration. Data was tabulated into excel sheets under headings age, gender, teeth no, patients reported. Then data was analyzed using SPSS software (23.0 version). Statistical analysis was performed using the chi square test.

RESULT AND DISCUSSION

1483 patients met the inclusion criteria for the present study, Only 981 patients reported back for post endodontic restoration after root canal treatment. Statistical analysis was performed using the chi square test. In the present study 66.15% of patients reported for post endodontic restoration, 33.8% of patients did not report back for post endodontic restoration, 41.9% (621) of included cases were 18-30 years age group, 26% (385) were 31- 40 years age group, 19.6% (290) were 41-50 years age group, 8.4% (124) were 51-60 years age group and 4.2% (63) were above 60 years of age, maximum number of patients 28.25% (419) of 18- 30 age group reported back for post endodontic restoration, the results were statistically not significant ($P > 0.05$) (Fig.2). In the present study 55.8% (828) were male patients and 44.2% (655) female patients, more number of male patients 36.35% (539) reported back for further treatment and the results

were statistically not significant ($P > 0.05$) (Fig.3). Teeth which most commonly underwent root canal treatment were mandibular first molar - 17.60% (261) followed by Mandibular second molar, maxillary central incisor - 8.83% - 8.90%, (131), More number of patients 17.60% (113) with root canal treatment in relation to mandibular first molar reported back for post endodontic restoration, the results were statistically significant ($P < 0.05$) (Fig 4).

Bacteria harbored in the oral cavity can cause periapical inflammation by penetrating the root canal not only before or during the endodontic treatment but also during the prosthetic treatment or after its completion. Proper working length determination, (Janani, Palanivelu and Sandhya, 2020) cleaning and shaping and Intracanal medicaments are usually indicated to eradicate the micro organisms completely (Manohar and Sharma, 2018). The need for an immediate and proper restoration after endodontic treatment is of utmost importance (Heling *et al.*, 2002). An appropriate and prompt restoration of the tooth after completion of endodontic treatment is highly recommended (Safavi, Dowden and Langeland, 1987; Alves, Walton and Drake, 1998). Failing to place a permanent restoration may result in a higher rate of tooth loss (Aquilino and Caplan, 2002; Heydecke and Peters, 2002; Fokkinga *et al.*, 2007). If a permanent restoration cannot be completed at the end of the root canal treatment it was suggested first to place Cavit or a similar material with good sealing abilities and then IRM for its high compressive strength (Hagemeyer, Cooky and Hicks, 1990). When 2 or more walls are missing, an addition of a post is required to restore the tooth (Smidt and Venezia, 2003). The space prepared for a cast post should be regarded as an unsealed root canal. It may therefore become contaminated by bacteria originating in the saliva during post preparation or through a leaking temporary filling. Disinfection of the prepared post space with sodium hypochlorite or chlorhexidine and antibacterial dressing is suggested (Heling *et al.*, 2002). However, one should bear in mind that the combination of sodium hypochlorite (Teja and Ramesh, 2019) and chlorhexidine (Noor, S Syed Shihaab and Pradeep, 2016; Nasim and Nandakumar, 2018); (Nasim and Nandakumar, 2018) results in the formation of a para-chloroaniline precipitate (Mavec *et al.*, 2006). The para-chloroaniline precipitate could stain dentin and impair the sealing ability of root canal sealers and post and core luting agents by occluding the dentinal tubules (Basrani *et al.*, 2007), (Siddique *et al.*, 2019). Endodontically treated tooth (Nasim *et al.*, 2018) is primarily weakened due to dental caries, loss of cervical tooth structure, trauma, or pre-existing restorations (Reeh, Douglas and Messer, 1989; Sedgley and Messer, 1992; Pantvisai and Messer, 1995; Basrani *et al.*, 2007). Tooth fracture usually occurs when the endodontically treated teeth are not immediately restored (Papalexopoulos and Filippatos, 2019). After completion of root canal treatment, permanent restoration of the teeth may be postponed for extended period of time. Occurrence of leakage around commonly used temporary filling materials has been reported to increase with time and it has been suggested that such leakage of occlusal restoration plays a role in eventual success (or) failure of endodontic therapy. No shows for scheduled appointments are a frequent occurrence, creating unused appointment slots, reducing patient quality of care and access to service, while increasing loss to follow up and medical cost. If the patient doesn't visit for post endodontic restoration it may lead to failure of the treatment. Present study was conducted to evaluate the number of patients reported back for post endodontic restoration.

In the present study 66.15% of patients reported for post endodontic restoration, 33.8% of patients did not report back for post endodontic restoration, 41.9% (621) of included cases were 18-30 years age group, 26% (385) were 31- 40 years age group, 19.6% (290) were 41-50 years age group, 8.4% (124) were 51-60 years age group and 4.2% (63) were above 60 years of age, maximum number of patients 28.25% (419) of 18- 30 age group reported back for post endodontic restoration, 13.62 % of 18 - 30 years age groups were highest and failed to report back due to school, colleges and office work, the results were statistically not significant ($P > 0.05$) (Fig.2). In the present study 55.8% (828) were male patients and 44.2% (655) female patients, more number of male patients 36.35% (539) reported back for further treatment and the results were statistically not significant ($P > 0.05$) (Fig.3), 19.49% of male patients were found to miss appointments due to work. Teeth most commonly undergone root canal treatment were mandibular first molar - 17.60% (261) followed by Mandibular second molar, maxillary central incisor - 8.83% - 8.90%, (131),

More number of patients 17.60% (113) with root canal treatment in relation to mandibular first molar reported back for post endodontic restoration, the results were statistically significant ($P < 0.05$) (Fig 4), 7.62% of patients with endodontic treatment in relation to mandibular first molar failed to report back for post endodontic restoration. In dental practice, missing appointments can disrupt the patient's treatment to a large extent. If the patients undergoing root canal treatment are not reporting back for post endodontic restoration it may lead to failure of root canal treatment after some time and tooth may also lead to fracture. Therefore, to control missed and cancelled appointments the dentist must educate the patients on their first visit and cautiously communicate the importance of maintaining the appointments schedule and its effect on treatment outcome. The patients should also be told how and when they can inform the clinic in case they were unable to make their appointments. Future studies should focus on eliminating missed and canceled appointments and encourage patient attendance in order to enhance the treatment outcome in addition to improving the economics and quality of dental practice. Previously we have worked on management of calcified canal (Kumar and Delphine Priscilla Antony, 2018) and we also studied regulation of matrix metalloproteinase-3 gene expression in inflammation (Ramesh, Teja and Priya, 2018). In the present study we wanted to analyse the patient perception in maintaining appointments and importance of post endodontic restorations.

CONCLUSION

In the present study 66.15% of patients reported for post endodontic restoration, 33.8% of patients did not report back for post endodontic restoration. Failure to report back for post endodontic restoration was less in the present study. Being busy with other activities and long distance were some reasons given by patients who failed to report back for post endodontic restoration.

AUTHOR CONTRIBUTION All authors have equal contribution in bringing out this research work

CONFLICT OF INTERES All authors in the present study declared no conflict of interest.

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RESULTS TABLES & GRAPHS

FREQUENCY TABLES

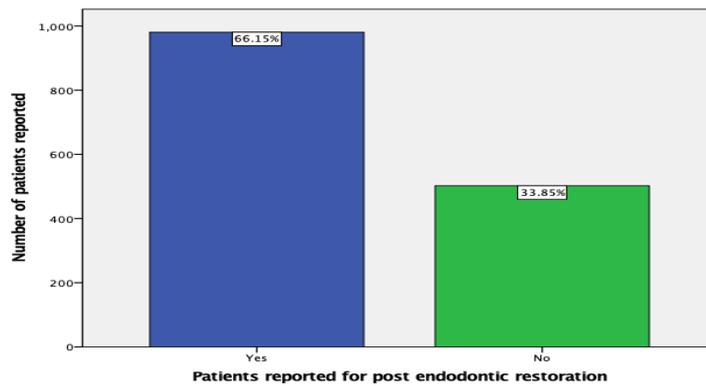


Fig.1: Depicts frequency and percentage distribution of number of patients reported on given appointment date. X axis denotes whether patients reported on given appointment date and Y axis denotes number of patients, Yes (Blue colour), No (Green colour). 33.8% (655) patients did not report back on the given appointment date, 66.15% (828) patients reported on given appointment dates.

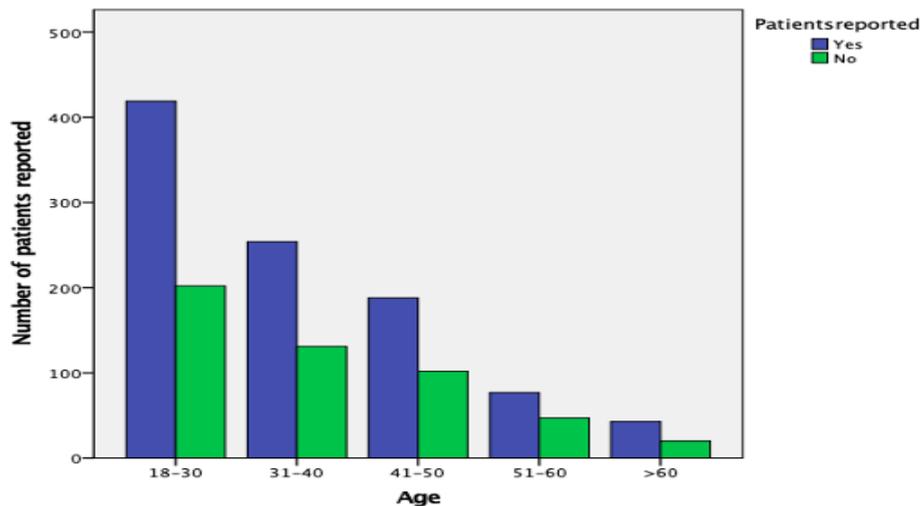


Figure 2: Bar graph shows association between age of patients and number of patients. X axis denotes age and Y axis denotes number of patients. Yes (Blue colour), No (Green colour), More number (28.25%) of 18-30 age group patients reported back for post endodontic restoration compared to other age groups. There was no significant difference between different age group patients reported on the given appointment date, chi square test $p = 0.781$ ($p > 0.05$).

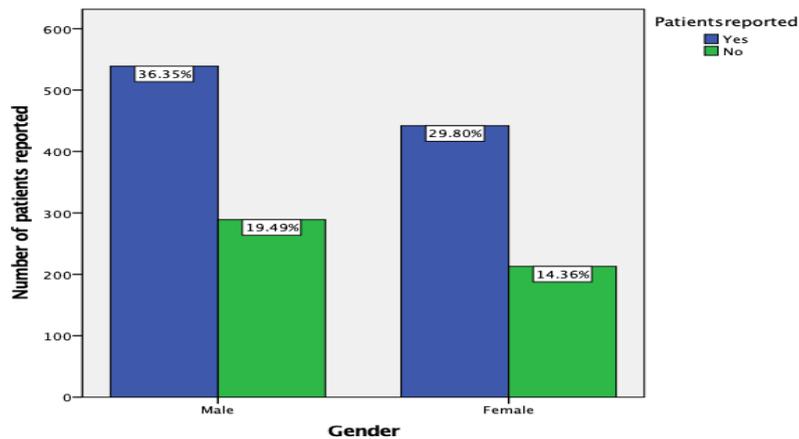


Figure 3: Bar graph shows association between gender of patients and number of patients. X axis denotes gender of patients and Y axis denotes number of patients. Yes (Blue colour), No (Green colour), More number of male patients(36.35%) reported back for further treatment as compared to female patients(29.80%). There was no significant difference between the gender of the patients, chi square test $p = 0.335$ ($p > 0.05$).

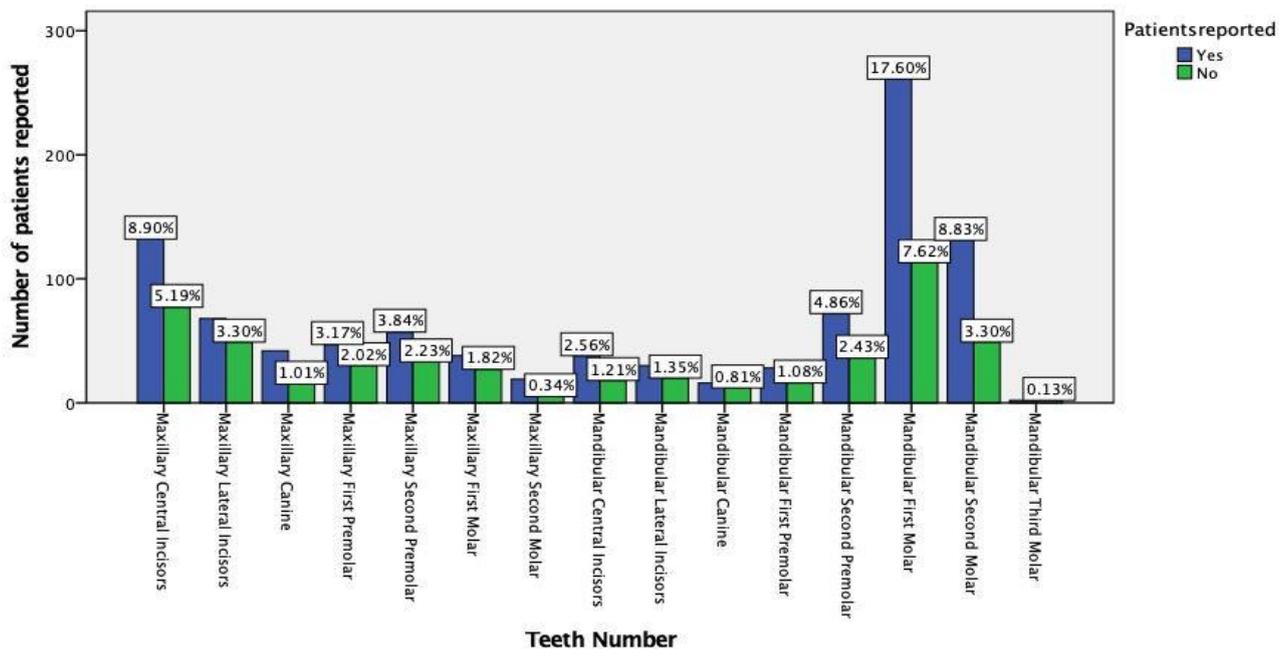


Figure 4: Bar graph shows association between teeth number and number of patients. X axis denotes teeth number and Y axis denotes number of patients. Yes (Blue colour), No (Green colour), More number of patients (17.60%) with complaint in relation to mandibular first molar reported back for post endodontic restoration. There was no statistically significant difference, chi square test $p = 0.178$ ($p > 0.05$).