

EVALUATION OF CURRENT TRENDS IN ENDODONTIC TREATMENT PROCEDURE AMONG THE DENTAL PRACTITIONERS

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ABSTRACT:

Root canal therapy is a highly prevalent treatment option in today's dental practice. The outcome of endodontic therapy is associated with various factors in order to maintain the quality of root canal treatment standards including both root canal fillings and coronal restorations and individual factors such as dentist knowledge, attitudes and skills. Therefore, the purpose of the present study was to gather information about the various aspects, technical and biological methods, materials, and attitudes employed during root canal therapy performed both by the general dental practitioners and endodontists and to compare their choice with established endodontic treatment standards, in order to evaluate and improve the quality of current practice. The results of the present study revealed the attitudes, techniques, materials and methods employed both by the general dentists and the endodontists to perform the root canal therapy. The survey questionnaire is a common instrument used in evaluating health care systems. The major disadvantage of surveys is that often only low response rates are obtained when the questionnaire is posted or mailed. Thus in order to overcome this drawback, in the present study the data was collected by meeting the dentists in person and the response was noted, which eventually overcome the bias also. Within the limitations of the above study, the following trends were identified: Majority of the clinicians establish the apical stop at a level 1 mm from the radiographic apex, the traditional method, which is still followed. Single visit root canal therapy is more common in all type of cases. Low level use of rubber dam for isolation during endodontic therapy was a striking feature noted in both the type of respondents.

Keywords: root canal therapy, irrigant, attitude, survey, questionnaire



INTRODUCTION:

Root canal therapy is a highly prevalent treatment option in today's dental practice. It is one of the fastest growing disciplines in daily clinical practice whereas contemporary endodontics often

involves the introduction of many newer instruments, materials and techniques. The outcome of endodontic therapy is associated with various factors in order to maintain the quality of root canal treatment standards including both root

canal fillings and coronal restorations and individual factors such as dentist knowledge, attitudes and skills.^[1] The environment in which the dentist works may also impact the outcome of root canal therapy.

Current information on the quality of root canal treatment has been mainly based on clinical studies performed in controlled environments at dental schools or in specialist clinics.^[2] The results of such longitudinal studies show success rate up to 96% for periapical health after endodontics treatment. However cross-sectional population based studies of endodontic treatment performed by general practitioners shows a different picture. They show a high frequency of inadequate root fillings and high rate of apical periodontitis associated with endodontically treated teeth which range from 20% - 60%.^[3,4]

Numerous studies have been published in evaluating the success and failure of root canal treatment.^[5-8] However, there are many opinions on how to best accomplish the goal of canal debridement, cleaning and shaping, and obturation. Indeed many innovative concepts, techniques and instruments have been introduced. The European Society of Endodontology in 1994 issued quality guidelines for endodontics treatment. This document is a step by step description of every phase of endodontic treatment. According to this document, a high quality of root canal treatment is one in which clinical symptoms originating from an endodontically-induced apical

periodontitis neither should persist nor develop after root canal therapy (RCT) and the contours of the PDL space around the root should radiographically be normal.^[9,10] Similar guidelines have been published by the American Association of Endodontics.

Overall, there is only few scientific data available about the general dental practitioner's approach to endodontic therapy and its impact on the success of root canal treatment is unclear. Therefore, the purpose of the present study was to gather information about the various aspects, technical and biological methods, materials, and attitudes employed during root canal therapy performed both by the general dental practitioners and endodontists and to compare their choice with established endodontic treatment standards, in order to evaluate and improve the quality of current practice.

MATERIAL AND METHODS:

A survey among the general dental practitioners and endodontists was carried out to investigate the materials and methods employed by them during root canal treatment procedure. A questionnaire was developed and piloted before the actual study was carried out. The questionnaire was fully piloted and refined for the clarity and scope before issued. The finally modified questionnaire was used to survey both the general dental practitioners (GDP) and endodontists registered by the dental council.^[11-13] The survey was carried out by meeting the dental surgeons and the

endodontists in person to collect their response through interview method to avoid any bias.

The questions were based on previous surveys and items pertaining to routine endodontic practice. The questions concerned:

1. The main professional activity, gender, years of professional activity and details of working environment.
2. Root canal preparation technique and choice of instruments, use of rubber dam, number of appointment, choice of working length determination.
3. The choice of root canal irrigant, the concentration of sodium hypochlorite use and the use of intracanal medicament.
4. The choice of obturation technique and sealer.
5. The attitude towards endodontic treatment, satisfaction with the outcome of treatment and whether they perform retreatment.

RESULTS:

In the present study, the response rate was 100%, since the questionnaire survey was conducted based on the interview method. The response for the survey was collected by meeting the dentist's in person and their opinion was recorded, which in turn reduced the level of bias too. The collected data was analysed using the SPSS software version 17. Unanswered questions were treated as missing values; only single unequivocal

replies were included. The results were calculated for each section and are represented in Tables I-III:

DISCUSSION:

The results of the present study revealed the attitudes, techniques, materials and methods employed both by the general dentists and the endodontists to perform the root canal therapy. The survey questionnaire is a common instrument used in evaluating health care systems. The major disadvantage of surveys is that often only low response rates are obtained when the questionnaire is posted or mailed. Thus in order to overcome this drawback, in the present study the data was collected by meeting the dentists in person and the response was noted, which eventually overcome the bias also. The response for each section and the difference of opinions between the GDP and the endodontist are discussed as follow;

1. Response rate:

The questionnaire survey was carried out by meeting the dentists in person and response was taken in an interview method, the response rate was 100%. Among the total response, the survey was conducted among 1500 dentists, which include 750 general dental practitioners and the remaining 750 were endodontists.

2. Rubber dam utilization:

According to the quality guidelines for endodontic treatment, infection control is of prime importance in root canal therapy. Use of rubber dam is considered

to be minimum standard in infection control. Although the application of rubber dam is always recommended during root canal treatment procedure to provide isolation, protection and improve visual access, only few of them follow this.^[14-16] The practitioners may equate the rubber dam use as costlier, time consuming, or discomfort to the patient.^[12] Only 10% of the endodontists always use rubber dam isolation during endodontic procedure. When compared with GDP around 47% of them does not use rubber dam for isolation.

3. Preoperative radiograph:

High quality preoperative radiograph has been suggested for accurate diagnosis, to assess difficult cases and it also constitute as an important dental record.

Around 40% of the endodontists routinely take preoperative radiograph before commencing endodontic treatments and around 47% of GDP use preoperative radiographs.

4. Working length determination:

Working length determination is one of the most critical step. Failure to accurately determine the length of the root canal often results in apical perforation; overextension of irrigants or obturation materials into the peri-radicular tissues and lead to incomplete instrumentation and obturation.^[17-20] Around 34% of GDP obtained working length radiographically whereas only 20% of endodontists relies on x-ray. And around 14% of the endodontists depends on combination

method of using both x-ray and electronic apex locator (EAL) for working length determination. But only around 6% of GDP use EAL. The most common and majority of response for determining the choice of working length is the distance to the radiographic apex was at 1mm. Around 30% of endodontists and 26% of GDP determine the length at 1 mm from the radiographic apex.

5. Instrument selection and maintenance:

The quality of bio-mechanical preparation of the root canal system is yet another important step, which influences the outcome of endodontic treatment. Numerous studies have shown the superiority of nickel titanium files over conventional instruments to shape the root canal system.^[21-23] Around 50% of endodontists and 30% of GDP use both stainless steel hand file and NiTi instruments. When comparing among the rotary instruments, majority of the endodontists prefer to use combinations of rotary instruments whereas the GDP prefer to use mainly the NiTi hand files.

When looking into the maintenance of their instruments, only 6% of the endodontists use glass bead sterilization method, 40% of the GDP use only cold sterilization method and 20% of the endodontists use hot air oven for sterilizing their instruments. Mostly both the endodontists and GDP dispose their endodontic instruments only after they see signs of distortion and none of them dispose it after single use.

6. Root canal irrigants:

The ideal root canal irrigant should effectively disinfect the canal to eliminate the biofilm.^[24] Most of the respondents indicate that they use more than one irrigating agents. The most commonly used irrigant are chlorhexidine followed by saline (Table I).

7. Inter-appointment dressing:

The purpose of intra-canal medicament is to reduce bacteria, control pain, reduce inflammation and dry the wet canals.^[25] Sjogren et al showed that the success rate of root canal treatment of such infected cases increases significantly, if there is an inter-appointment dressing of calcium hydroxide. In this survey the use of calcium hydroxide was more common, 40% of the GDP use calcium hydroxide for disinfection and around 24% of the endodontists use calcium hydroxide along with iodoform (Table I). The factors that contribute to the popularity of calcium hydroxide are: low incidence of toxicity, available as injectable formulation, and its reported effectiveness.^[13,11] To remove the smear layer during preparation of the root canal systems most of the endodontists (50%) use chelating agent and only 17% of the GDP use chelating agent for preparation.

8. Number of visits per endodontic treatment:

Respondents were asked to give an estimate number of visits required to complete the root canal procedures for

single-rooted (vital and non-vital) and multi-rooted (vital and non-vital) teeth.

9. Obturation technique:

The quality of root filling contributes to the overall success of endodontic treatment. Either cold or warm lateral compaction of gutta-percha with a root canal sealer was used by most of the respondents. The majority of the GDP used cold lateral compaction of gutta-percha along with endomethasone (34%) sealer for obturation. Among the endodontists, 40% of them follow single cone obturation along with the same sealer. Only 4% of them used thermo-plasticized obturation technique with resin (13%) sealer.

10. Post-operative x-ray:

Most of the GDP (30%) do not take post-operative x-ray after the root canal therapy whereas only 3% of the endodontists do not take post-operative x-ray (Table II).

11. Use of systemic antibiotics:

Dental practitioners must have a thorough understanding of the clinical indications for antibiotic prescription in order to prevent misuse or overuse of these medicaments. Antibiotics are prescribed for certain clinical conditions and majority of the GDP (40%) prescribe antibiotics during their routine endodontic therapy and around 33% of the endodontists prescribe antibiotics routinely.

12. Coronal restoration:

Around 14% of GDP and 20% of endodontists always provide their endodontically treated patients with final coronal restoration and around 20% of the GDP never give them the final post endodontic restoration.

13. Monitoring completed root canal treatment:

Around 40% of the GDP and 26% of the endodontists do not routinely follow their endodontically treated patients. Only 13% of endodontists do follow their patients routinely.

14. Attitude of practitioners towards endodontic treatment and re-treatment:

Majority of the GDP (30%) and endodontists (37%) were satisfied with their routine root canal treatment (Table III). But 13% of the GDP feels that their endodontic therapy needs to be improved. When asked about the frequency of re-treatment, 13% of the GDP perform re-treatment in their clinic and around 37% of endodontists perform re-treatment.

CONCLUSION:

Endodontics is an evolving discipline with considerable advances in techniques and materials over the last decade. The present small scale study may not necessarily represent the true picture. However, it can be used as reference for a larger survey in the future. Within the limitations of the above study, the following trends were identified:

- Majority of the clinicians establish the apical stop at a level 1 mm from the radiographic apex, the traditional method, which is still followed.
- Single visit root canal therapy is more common in all type of cases.
- Low level use of rubber dam for isolation during endodontic therapy was a striking feature noted in both the type of respondents.

The advancement in dentistry has introduced many materials, instruments and newer techniques. Despite these inventions, the present survey shows that the current scenario for root canal therapy among the general dental practitioner needs to be updated. The professional bodies in endodontics should embark on training programs, seminars, and workshops aimed at improving the knowledge and skills of the GDPs. Appropriately structured continuing educational courses may be able to meet the demands and needs of GDPs. Thus, it is important to improve the quality of existing method of endodontic therapy in order to ensure the necessary competency in clinical practice.

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TABLES:

Table I: Choice Of Root Canal Irrigants And Disinfection Intracanal Medication

| Reply | BDS | % | MDS | % | Intracanal Medicament | BDS | % | MDS | % |
|--------|-----|-------|-----|------|-----------------------|-----|------|-----|------|
| Saline | 500 | 33.3 | 250 | 16.7 | CaOH | 600 | 40 | 250 | 16.7 |
| NaoCL | - | - | 100 | 6.7 | CaOH + Iodoform | 50 | 3.33 | 350 | 23.3 |
| CHX | 200 | 13.33 | 350 | 23.3 | CMCP | 50 | 3.33 | 100 | 6.7 |
| H2O2 | - | - | 50 | 3.33 | Other | 50 | 3.33 | 50 | 3.33 |
| EDTA | 50 | 3.33 | 50 | 3.33 | | | | | |

Table II: Data Related To Post-Operative X-Ray After Treatment

| Reply | BDS | % | MDS | % |
|--------------|-----|-------|-----|------|
| Always | 100 | 6.7 | 150 | 10 |
| Occasionally | NA | - | NA | - |
| Sometimes | 150 | 10 | 550 | 36.7 |
| Never | 500 | 33.33 | 50 | 3.33 |

Table III: Attitude Towards Endodontic Treatment And Satisfaction Of The Practitioner

| Reply | BDS | % | MDS | % |
|------------------------|-----|-------|-----|------|
| Very satisfied | 100 | 6.7 | 150 | 10 |
| Satisfied | 450 | 30 | 550 | 36.7 |
| Subject to improvement | 200 | 13.33 | 50 | 3.33 |