

ENDODONTIC RETREATMENT

¹SANA EHSEN NAGI, BDS – Resident Operative Dentistry, AKUH

²FARHAN RAZA KHAN, BDS, MS, MCPS, FCPS - Assistant Professor, Operative Dentistry, AKUH

³MUNAWAR RAHMAN, BDS, MCPS, DDS – Senior Consultant, Operative Dentistry, AKUH

ABSTRACT

To salvage a failed root treated tooth, retreatment is often warranted. Although some retreatment guidelines are there but on many areas there is no consensus on retreatment protocols and procedures. A study was planned to assess the endodontic retreatment preferences and decision making among practicing dentists of Karachi. This study also compared the retreatment preferences of dentists on the basis of their clinical experience. A questionnaire was distributed to participants. Information was obtained on retreatment cases, use of medicaments, solvents and antibiotic prescription etc. A case scenario was also shared and responses on decision making were obtained.

The response rate was 58%. The most commonly reported reason for endodontic retreatment was under prepared / under filled canals. Almost half of the dentists reported inappropriate decision making in retreatment. Nearly 45% participants were confined to hand instruments only and 15% were not employing any solvent. This shows that in general endodontic retreatment is not done as per the internationally accepted standards.

Key Words: Endodontics, Retreatment, Dental practice.

INTRODUCTION

Endodontic treatment is primarily the combination of chemo-mechanically preparing the root canal space to facilitate the placement of a biocompatible material that seals the canal throughout its entry. In doing so, microorganisms and organic material that may decompose and sustain bacterial growth are removed to maintain or restore the health of the periradicular tissues.¹

A meta-analysis of conventional endodontic treatment previously conducted has reported a success rate in a range of 78-84%.² As micro-organisms colonizing root canals play a critical role in the development of pulpal and periapical disease, therefore the success of endodontic treatment relies on the techniques employed in the removal of intra-radicular bacteria.³ Hence, isolation, chemomechanical preparation, obturation along with final coronal restoration has an impact on the long-term success of root filled teeth.⁴⁻⁵

Endodontic retreatment is indicated when the original treatment appears inadequate or has failed or because the root canal has been contaminated by prolonged exposure to the oral environment.⁶⁻⁹ Retreatment of previously obturated root canals is becoming more and more common in endodontic practice.¹⁰ The aim of root canal retreatment is to remove the existing root canal filling material completely, by regaining

access up to the apical foramen thereby allowing the entire root canal system to be cleaned and facilitating thorough shaping, disinfection and final obturation of the entire endodontic system.¹¹

Various treatment options in cases of primary endodontic failure include orthograde retreatment, retrograde retreatment, a combination of both methods or extraction in cases of teeth with poor prognosis.¹² Various challenges faced during endodontic retreatment include untreated canals, ledging, perforation, transportation, weakening of the root, over extension of filling, under preparation, blockage, remaining fractured instrument and inflammatory apical resorption.^{13,14}

Methods commonly employed for removal of existing root filling material and access to the apical foramen are by thermal, mechanical, chemical or a combination of these.

Standard of care is to perform an orthograde retreatment before proceeding with retrograde retreatment. An apicoectomy or retrograde retreatment is the excision of the apical portion of a tooth root through an opening made in the overlying bone. This is followed by retrograde filling to seal the apex.¹⁵ Common indications for retrograde retreatment include failed orthograde root canal treatment, non-negotiable complex root canal anatomy and fractured instrument in the canal.

Previous studies have investigated primary endodontic techniques used in dental practice outside the country like United Kingdom. These studies have mainly focused on specific areas of endodontic technique, and a very few studies have investigated all aspects of endodontic retreatment practices.¹⁶⁻¹⁷

Corresponding author: ¹Dr Sana Ehsen Nagi, Resident JHS Building, 1st Floor, Dental Clinics Department of Surgery, Aga Khan University, PO Box 3500, Stadium Road, Karachi-74800 Pakistan Tel. 0333-2394170 E-mail: sana.ehsan@aku.edu

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Therefore, it was decided to carry out a survey in order to understand the current practice of endodontic retreatment in dental teaching institutes where dental students and specialists are trained and other private dental practices across Pakistan.

Objectives

1. To assess endodontic retreatment preferences and decision making among practicing dentists of Karachi.
2. To compare retreatment preferences of dentists with varying clinical experience.

METHODOLOGY

A cross-sectional study was conducted which included private practices, dental institutions and other teaching facilities involved in graduate and postgraduate endodontics in Karachi.

Dentists who carried out endodontic retreatment, for example, postgraduate trainees, faculty and private practitioners were included in the study. Dentists who were not active in clinical practice were excluded from the study. The survey questionnaire gained information on aspects like number of retreatment cases seen per month, most frequent cause of retreatment encountered in practice, use of medicaments and solvents, number of visits for retreatment, antibiotic prescription etc. A case scenario was also presented in the end with various treatment options.

The duration of the present study was four months with a sample size of 100 survey forms. The sampling technique employed was non-probability, convenience sampling. An informed consent was elicited from the participants of the study.

Data Analysis

Data were analyzed using SPSS version 19.0. Descriptive statistics and frequency distribution were computed. Chi square test was applied to compare the difference between two groups of less than 5 years of clinical experience versus more than 5 years of experience. Level of significance was kept at < 0.05 . Our study was approved by the ethical review committee. Reference number was 2824-Sur-ERC-13.

RESULTS

Questionnaire was sent to 100 dentists out of which 58 were received, so response rate was 58%. 55% of the participants were males and 45% were females. Out of the 58 participants, 13 were private practitioners, 33 were postgraduate trainees and 12 were faculty members. The participants had graduated from 12 different institutions of Pakistan. 58% had clinical experience of < 5 years, whereas 42% had clinical experience of 5 years or more.

A statistically significant difference was found for visits required for completion of orthograde retreatment are shown in Table 1. Use of inter-appointment intracanal medicament and the most commonly employed medicament is illustrated in Table 2.

The comparison groups for the preferred management option in a case scenario of a failed root canal treatment revealed a statistically significant difference between the dentists with varying clinical experience shown in Table 3. Most common reason for primary

endodontic failure and the preferred instruments for retreatment are mentioned in Table 4. Cases of retreatment encountered per month and the preferred solvent in retreatment cases are mentioned in fig 1 and 2. Half of the participants in question prescribed antibiotics (50%) during retreatment. Augmentin was the most frequently prescribed antibiotic followed by Cefadroxil and Metronidazole.

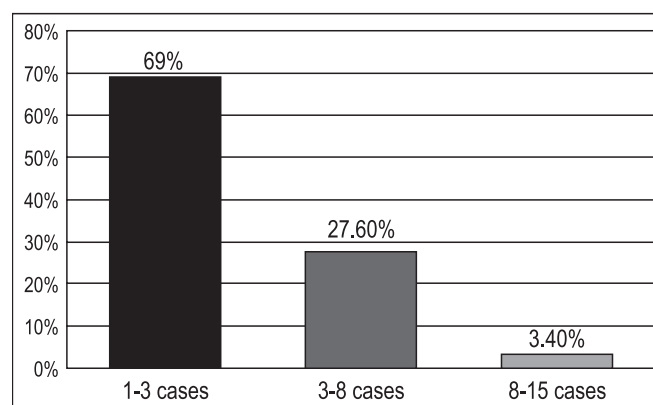
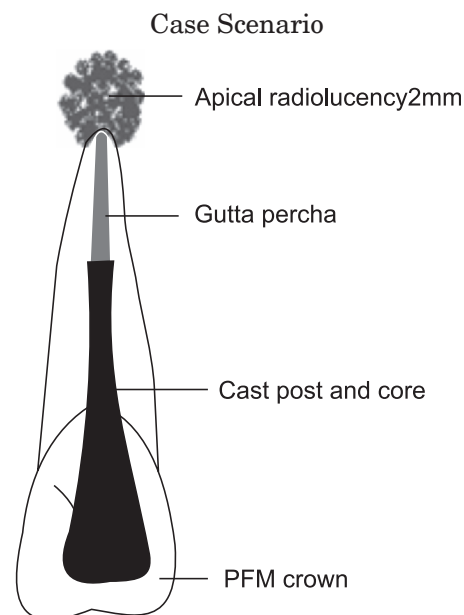


Fig 1: Volume of Retreatment cases in clinic per month

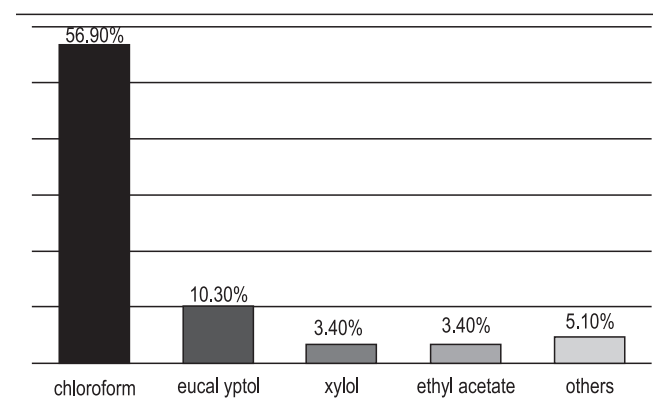


Fig 2: Preferred solvent

TABLE 1: NUMBER OF VISITS FOR THE COMPLETION OF RETREATMENT

| | Number of visits preferred for completion of orthograde retreatment | | | P-value |
|---------------------|---|----------|----------|---------|
| | 1 visit | 2 visits | 3 visits | |
| Clinical experience | | | | |
| <5 years | 26.1% | 65.2% | 8.7% | 0.041 |
| >5 years | 52.9% | 47.1% | 0% | |

Chi square test was applied.

TABLE 2: USE OF INTRACANAL MEDICAMENTS

| Frequency of medicament used (%) | | | | |
|----------------------------------|-----------|------------|--------------------------|----------------------|
| Always | | Frequently | | Selected cases |
| 36.2% | | 37.9% | | 20.7% |
| Medicament preferred (%) | | | | |
| Chlorhexidine (CHX) | Metapaste | Calcipax | Chlorhexidine & Calcipax | Metapaste & Calcipax |
| 5.2% | 10.3% | 39.7% | 19% | 13.8% |

TABLE 3: MANAGEMENT OPTIONS CHOSEN FOR THE CASE SCENARIO

| Clinical experience | Management options | | | | P value |
|---------------------|---|------------------------|---|------------------------|---------|
| | Extraction followed by prosthetic replacement | Retrograde retreatment | Orthograde followed by retrograde retreatment | Orthograde retreatment | |
| >5 years | 0.0% | 45.8% | 29.2% | 25.0% | 0.048 |
| <5 years | 8.8% | 47.1% | 14.7% | 23.5% | |

Chi square test was applied

TABLE 4: REASONS OF PRIMARY ENDODONTIC FAILURE AND PREFERRED INSTRUMENTS FOR RETREATMENT

| Variables | Options | Number of responses |
|--|-------------------------------|---------------------|
| Reasons of primary endodontic failure | Lack of coronal seal | 28 |
| | Extrusion of filling material | 10 |
| | Unidentified canal | 36 |
| | Underfilled canal | 41 |
| | Fractured instrument | 8 |
| Preferred instruments for retreatment. | Gates glidden drills | 50 |
| | Ultrasonics | 8 |
| | Hand files | 50 |
| | Rotary instruments | 35 |
| | System B | 4 |
| | Touch and heat | 4 |

DISCUSSION

To date there is very limited data on standardized techniques for retreatment. Current practices in endodontic retreatment are influenced by the clinical experience and personal preferences. Therefore the survey questionnaires were not only sent to teaching dentists but private practitioners were also included. The responders had graduated from twelve different dental colleges across the country showing diversity of training among the participating group.

The participants belonged to more clinically experienced group, (58.6%) that is with an experience of more than five years, amongst which half of the participants

were postgraduate trainees (56.8%) with other participants being faculty (20.6%) and private practitioners (22.45%) which reflects that most endodontic retreatment are being performed by the postgraduate trainees.

International studies conducted by Cruz et al¹⁶ and ML Good¹⁸ in 16 and 20 dental schools respectively, show that hand files are the most common instrument used for canal preparation. This finding is similar to present study in which majority of the participants opted for hand instruments for canal preparation. Current study is in agreement with the Hommez¹⁹ study in terms of intracanal medicaments in which calcium hydroxide was most frequently employed medicament

and chloroform (56%) being the most commonly used solvent.

A case scenario that was presented to the participants of a 30 year old lady who presented with a complaint of painful endodontically treated upper central incisor, the tooth was restored with a custom made cast post core and porcelain fused to metal crown. Upon presentation, the tooth was tender to percussion and radiographs revealed a 2 mm of radiolucency at the apex of the tooth. The participants were asked to choose the most appropriate management option which included orthograde retreatment, orthograde followed by retrograde treatment, retrograde treatment only and extraction followed by prosthesis. It was seen that both the groups of varying clinical experience opted for retrograde treatment which is in opposition to the study conducted by Hommez¹⁹ in which the participants chose orthograde retreatment.

As reported in international journals, the preferred treatment of failing endodontic cases is orthograde retreatment or a combination of orthograde and retrograde treatment. In the current study, 46% dentists selected retrograde retreatment which when compared to international academic and clinical practices, falls below the standard of care.

In this study, most of the participants preferred using solvents (83.5%) for the removal of previous root filling material and the preferred solvent was chloroform (56.9%) which is more as compared to the study conducted by Hommez (36.5%)¹⁹ and less utilization of solvents in the present study as compared to ML Good¹⁸ (88%).

There is a considerable need for the improvements in retreatment practices in terms of appropriate decision making, proper case selection, diagnosis and treatment planning. Moreover, there is a need for the employment of correct technique, training and expertise as well as encouragement for the use of rotary instrumentation in retreatment practice.

In the past, most surveys conducted have mainly focused on primary endodontic treatment, but there are very few studies on endodontic retreatment and hence limited amount of data is available. Therefore, the current study focused primarily on the current trends in endodontic retreatment and contributes towards increasing pool of data on retreatment practice. The present study questionnaire covered most aspects relevant to endodontic retreatment.

CONCLUSIONS

Based on clinical experience, there was a statistically significant difference between dentists choosing extraction of the affected tooth over retreating it. Almost half of the clinicians in question preferred retrograde retreatment over all other modalities which reflected an inappropriate decision making in retreatment as orthograde is the method of choice followed by retrograde surgical procedure if needed.

And it was noted that a proportion of dentists do not employ rotary instruments in retreatment, a more efficient and effective means of carrying out primary treatment as well as retreatment. However, the dentists

used chloroform as a part their routine in orthograde retreatment procedures for the removal of root filling material from the root canal system.

Recommendations

It is suggested that difficult cases of retreatment should be referred to the specialists for retreatment. Continuing dental education programs and workshops should be conducted frequently so that better care can be provided to the patients. Other cities of the country should also be explored regarding their trends towards endodontic retreatment practice in order to achieve best evidence based practice in the best interest of patients.

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