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An expeditious update on single visit endodontic retreatment: A case series

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Abstract

Adequate cleaning and shaping of the canals to reduce the microorganisms below the threshold level is one of the most important goals of endodontic treatment. With the advent of newer materials and techniques, this goal can be achieved in a single appointment in many teeth which have been endodontically treated, but have failed the endodontic treatment. This case series highlights single visit endodontic retreatment as an important aspect of day-to-day dental practise.

Keywords: endodontic retreatment, single-visit, periapical index

Introduction

With the introduction of novel cleaning and shaping techniques and materials, root canal treatments can be completed safely in a single visit instead of multiple visits. Root canal retreatment is a type of procedure that is applied when previous RCTs have failed [1]. Postoperative pain after endodontic retreatment is an undesirable occurrence for patients and clinicians [2].

The orthograde retreatment of dental elements previously treated with the most varied techniques is a fairly common clinical practice, particularly for endodontic specialists [3]. The decision-making process should consider the many different variables such as presence or absence of apical periodontitis, degree of pre-operative pain and the Periapical Index (PAI) [4]. Completing the treatment in a single appointment reduces the treatment time and cost, decreases microleakage risk and avoids recontamination of root canals between appointments in multiple-visit treatments [4]. In fact, no significant differences were observed in healing of periapical radiolucency between teeth treated in one visit (without) and those treated in two visits using calcium hydroxide for 4 weeks and that the presence of a positive bacterial culture at the time of filling did not influence the outcome of treatments [5].

This case series highlights the need for practising “single visit endodontic retreatments” on a daily basis and the considerations to be acknowledged while performing them.

Case Report 1

A 34-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain in the upper left back tooth region in the last 9 days. While recording case history, she revealed that she had got an endodontic treatment done in the same region 2 months ago. On clinical examination, temporary restorative material was noted in relation to the tooth 27. On radiographical examination, it was revealed that the root canal fillings were 5mm beyond the apices of the three roots. (Fig 1a) The pain was moderate, intermittent and aggravated on chewing food with no history of swelling. The patient had to travel a long distance back after the treatment. Considering these clinical factors, single-visit endodontic retreatment procedure was initiated for the tooth 27. The temporary restoration removal was followed by removal of gutta percha using Pro-Taper Retreatments files and H-files. (Figs 1b, 1c) No chemical solvents were used to remove the gutta-percha or the sealer. The working length was determined after confirming apical patency with #15 K-file, and cleaning and shaping was done using Pro-Taper GOLD rotary files, and irrigation was done with 2.5% sodium hypochlorite activated using Endoactivator.

This was followed by use of 17% EDTA and saline rinse. Final rinse was done using 2% Chlorhexidine. The master cone IOPA was followed after confirming with the tug back. (Fig 1d) The obturation was done using cold lateral condensation method followed by post-endodontic composite restoration. (Figs 1e, 1f) The 3-month follow-up radiograph (Fig 1g) is shown, and clinically reduction of the symptoms indicates successful endodontic retreatment.

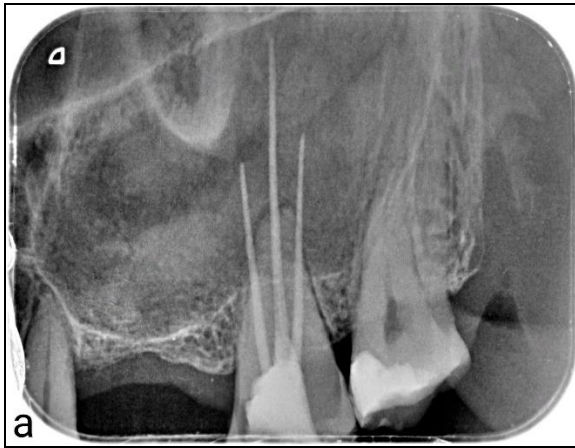


Fig 1a: Pre-operative radiograph (gutta percha 5mm beyond apex)



Fig 1b: Temporary restoration and gutta percha removed

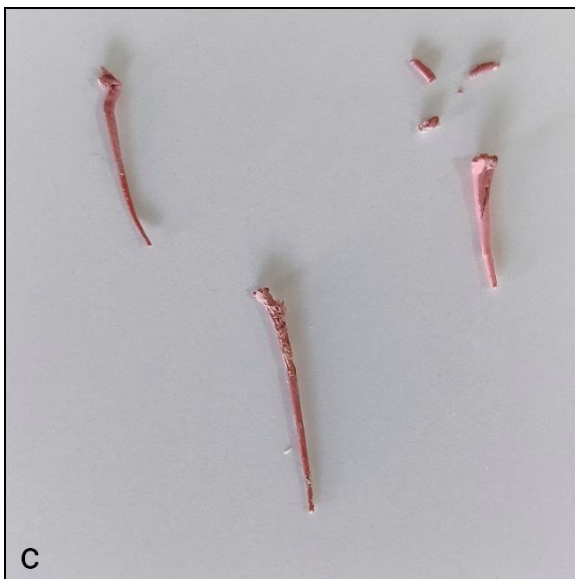


Fig 1c: Clinical photograph of retrieved gutta percha

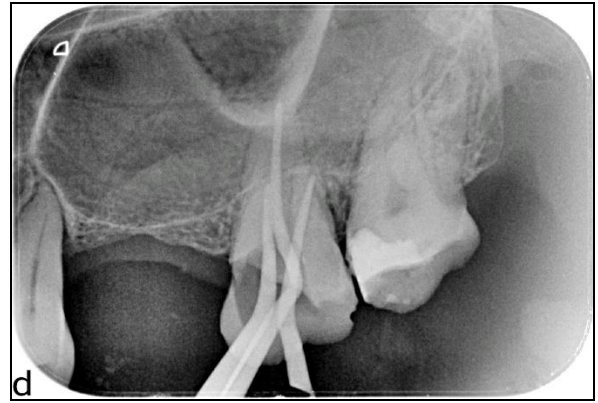


Fig 1d: Master cone radiograph

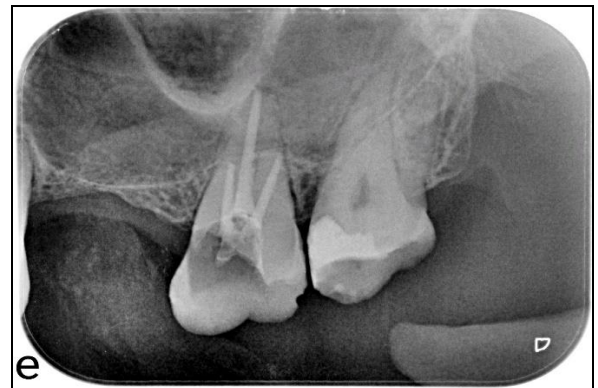


Fig 1e: Post-obturation radiograph



Fig 1f: Post-endodontic restoration (immediate post-op)

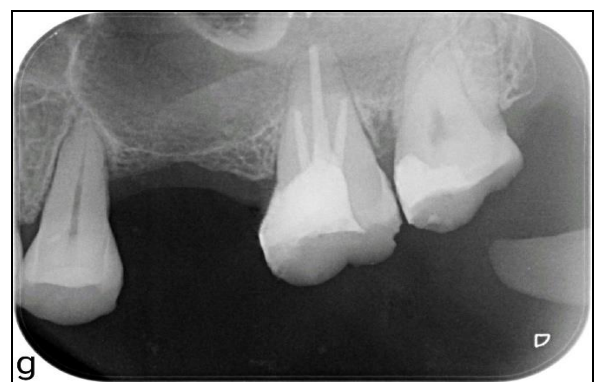


Fig 1g: 3-month follow-up radiograph

Case Report – 2

A 48-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with a chief complaint of mild pain in the lower right back tooth region in the last 1 month. While recording case history, she revealed

that she had got an endodontic treatment done in the same region 2 years ago. On clinical examination, exposed root canal filling material was noted in relation to the tooth 45. On radiographical examination, it was revealed that there was a periapical lesion 2X3mm (PAI = 2) in dimensions and inadequate obturation. (Fig 2a) The pain was mild, intermittent and aggravated on chewing food with no history of swelling. The patient had to travel to another city after the treatment. Considering these clinical factors, single-visit endodontic retreatment procedure was initiated for the tooth 45. The temporary restoration removal was followed by removal of gutta percha using Pro-Taper Retreatment files and H-files. (Fig 2b) No chemical solvents were used to remove the gutta-percha or the sealer. The working length was determined after confirming apical patency with #15 K-file (Fig 2c), and cleaning and shaping was done using Pro Taper GOLD rotary files, and irrigation was done with 2.5% sodium hypochlorite activated using Endoactivator. This was followed by use of 17% EDTA and saline rinse. Final rinse was done using 2% Chlorhexidine. The master cone IOPA was followed after confirming with the tug back. (Fig 2d) The obturation was done using cold lateral condensation method followed by post-endodontic composite restoration. (Figs 2e, 2f) The 3-month follow-up radiograph (Fig 2g) shows reduction in the size of the lesion, and clinically reduction in the symptoms, both of which indicate successful endodontic retreatment.



Fig 2a: Pre-operative radiograph (inadequate obturation, PAI=2)



Fig 2b: Clinical photograph of the retrieved gutta percha

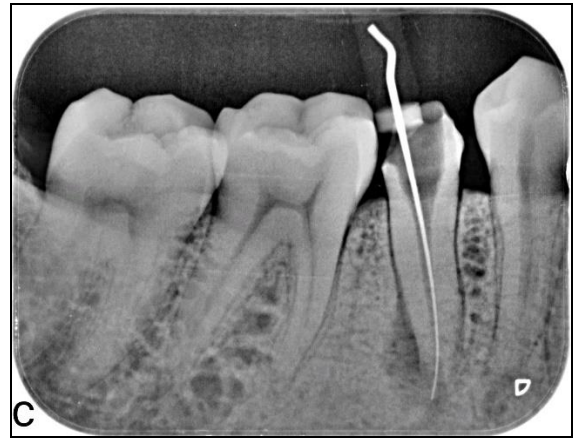


Fig 2c: Working length radiograph



Fig 2d: Master cone radiograph



Fig 2e: Post-obturation radiograph



Fig 2f: Post-endodontic restoration (immediate post-op)



Fig 2g: 3-month follow-up radiograph

Discussion

Single-visit RCT has been recommended for use in cases with purulent inflammation, traumatic pulpal exposure, or necrotic pulp with a present sinus tract [6]. Single-visit RCT is more advantageous than multiple-visit RCT in terms of time and cost. Thus, it is a treatment plan that is more amenable to the needs of busy patients [7, 8].

Post treatment diseases could be treated by two options including orthograde retreatment and apical surgery. It is well accepted that nonsurgical retreatment for previously failed endodontic therapy provides favorable results [9]. In a previous study, orthograde retreatments presented a success rate of 81% classified as healed and 93 % as no symptoms and fully functional [10]. In a systematic review, it has also been concluded that endodontic surgery offers more favourable initial success but orthograde retreatment yields to a better long-term outcome [11].

A retrospective study done by Eyuboglu T.F. *et al* in 2015 on single visit endodontic retreatments in 173 patients, which presented 90.9% success rate as 98.2% of the teeth were asymptomatic and fully functional after a mean observation time of 29 months. Age, gender, tooth type and periodontal defects had no effect on the outcome measures [4]. In his study, the criteria for selection of patients was patients having endodontically treated teeth with periapical index score ≤ 2 (PAI ≤ 2), i.e., periapical lesions which are less than 5mm in diameter [4, 5].

The irrigation protocol to be followed is not yet established, but in this case series, the highlight was usage of 2.5% sodium hypochlorite followed by removal of smear layer using 17% EDTA, which was rinsed using saline, followed by use of 2% chlorhexidine and a final rinse with saline [12].

Completing the treatment in a single appointment reduces the treatment time and cost, decreases microleakage risk and avoids recontamination of root canals between appointments in multiple-visit treatments. In fact, no significant differences were observed in healing of periapical radiolucency between teeth treated in one visit (without) and those treated in two visits using calcium hydroxide for 4 weeks and that the presence of a positive bacterial culture at the time of filling did not influence the outcome of treatment [5, 13].

The type of the definitive restoration was also found to be ineffective on the outcome of orthograde retreatments that was also in agreement with previous studies. The single-appointment approach might also be the reason for high success rate of orthograde retreatments in this study regarding the previous studies [14, 15]. Patients are being followed up for long-term observations on the outcome measures reported in

this study.

Thus, single-appointment root canal retreatments could be considered as a viable treatment option for orthograde retreatment cases with periradicular lesion size smaller than 5 mm and with mild symptoms.

Conclusion

Single-visit endodontic treatments and retreatments are being more commonly practiced in the past decade due to the constant evolution in cleaning and shaping dynamics and obturation methods, which is yielding favorable results in patients requiring faster treatments. However, further long-term studies are required to establish the guidelines for single visit endodontic retreatments.

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