Single Visit Root Canal Treatment

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Introduction

Endodontic therapy in defence dental setup should be simple, predictable and time saving. Root canal treatment (RCT) is the preferred management modality for root canal infections. The execution of RCT is more challenging and demanding in molars for their unique multi canal system. The canals are often 'c' or 's' shaped and narrow. Since loss of permanent molars is a threat to the occlusal table, single visit root canal treatment was tried to assess its viability in defence environment.

Clinical procedure

To minimise the man hours lost on account of multiple visits for RCT in defence set up, we tried single sitting therapy with the available equipment and material. Endodontic rotary instrument with profiles, absorbent paper points, root canal sealant, gutta percha points, sodium hypochlorite 3% and EDTA based root canal conditioner were used for the procedure.

Cases were selected from daily out patient department. Pulpal exposure was ascertained clinically and confirmed radio graphically. After the preparation of access cavity, the canals were prepared using above mentioned rotary instrument and profiles. After the removal of pulp, the canals were flushed with 3 % sodium hypochlorite. Root canal conditioner was dispensed on the instrument and carried to the canal. The instrumentation was followed by irrigation with sodium hypochlorite. The procedure was repeated with instruments being used in increasing order from size 15 to 40. The canals were prepared using 3% sodium hypochlorite until all evidence of bubbling had ceased. The canals were instrumented to 0.5 mm short of the radiographic apex (Fig.1). The canals were dried and obturated with lateral condensation method using sealant and gutta percha points and the tooth was restored with a suitable restoration. Approximately fifty minutes were required to complete the entire procedure in each case.

A total of sixty molars were treated over a period of four months out of which fifty-six reported for review six months postobturation and 90% of these were asymptomatic (Table 1).

Discussion

The management of direct pulp exposure by caries or other injuries has been challenging and various methods like pulp capping, pulpotomy, and pulpectomy followed by root filling have been used. Proponents of pulp capping prefer the procedure as it is less invasive, less tissue destructive and easier to carry out thus saving time, effort and money. The mechanism of lesion development and pulp breakdown may be an important reason why pulps show a declining rate of survival over time following capping in pulpotomy [1].

Fig. 1 : Conformation of working length

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Table 1**Comparison of pre and post treatment pain**

Pain	Pretreatment	Six months post obturation*
Severe	36	0
Moderate	14	2
Mild	10	1
Nil	0	53

Four cases did not report for post obturation review

Predictability of successful pulp capping is inferior to long term success rate of endodontic therapy. More over the repair phenomenon developing in the pulp may result in the narrowing of the pulpal space making endodontic treatment difficult [2].

Between these two points of view are those who consider pulp capping appropriate only for exposures in healthy pulps after accidental trauma or those displaying signs of minimal pulpitis. In case of caries penetration, the tissue may be more or less inflamed, depending on the extent of the bacterial invasion [3]. There are no reliable methods to assess the extent of inflammation and identify a cut off point between a reversible or irreversible inflammatory pulpal condition. Spontaneous or inductible pain episodes of a lingering character, combined with percussion sensitivity, appear to be the best clinical predictors, currently available to suggest an impaired prognosis for pulp capping [4].

Traditionally RCT has been divided into two or more appointments to disinfect the canal, improve patient comfort and observe healing before permanent filling. However one-visit endodontic treatment is faster, well accepted by patients and prevents the recontamination of root canals between appointments. Most pulpal and periradicular pathologies are inflammatory following infection. Regardless of the instruments and file sizes employed microorganisms are rarely eliminated completely from the root canals. Remaining pathogens may jeopardize the outcome of the root canal treatment [5]. Irrigation with sodium hypochlorite was found to be significantly more effective than saline in rendering canals free of bacteria [6]. It has been reported that the mechanical action of instrumentation and irrigation significantly reduced the number of bacterial cells in the root canal irrespective of the technique [7].

Nickel titanium (NiTi) files were five times more likely to achieve success than stainless steel files because they maintain the original canal shape during instrumentation [8]. NiTi rotary instruments can predictably enlarge root canals while maintaining the original path, to sizes not routinely available with stainless steel files. Since larger preparations remove more bacterial cells, a higher rate of treatment success rate is expected.

However the treatment of necrotic pulps in one

session is a controversial issue. There are many inclusion criteria for selection of cases [9]. It is suggested that decisions on the use of single or multiple-visit treatment should be based solely on the diagnosis and not the time available for treatment. Studies have found no difference in the incidence of postoperative pain between one and multiple visit endodontics [10] where as fewer failures were noted in the two visit treatment group than in the one visit treatment group [11]. Inability to dry canals completely, insufficient time for the procedure, long appointment induced stress on patient, the operator skill, root canal anatomy and instrument availability should also be considered while deciding upon single visit treatment.

In a vital pulp, the infection is superficial therefore pulp extirpation and the root filling are best completed in a single visit treatment. Flare up induced by the leakage of the temporary seal is reduced and the teeth are ready sooner for final restoration diminishing a risk of a fracture. Completing root canal treatment in one appointment is an effective and time saving procedure in selected cases.

Conflicts of Interest

None identified

References

1. Lim KC, Kirk EEJ. Direct pulp capping: a review. *Endod Dent Traumatol* 1987; 3:213-9.
2. Bergenholtz G, Spangberg L. Controversies in endodontics. *Crit Rev Oral Biol Med* 2004; 15:99-114.
3. Horsted P, sondergaard B, Thylstrup A, El Attar K, Fejerskov O. A retrospective study of direct pulp capping with calcium hydroxide compounds. *Endod Dent Traumatol* 1985; 1:29-35.
4. Langelang K. Tissue response to dental caries. *Endod Dent Traumatol* 1987; 3:149-71.
5. Siqueira JF Jr. Aetiology of the endodontic failure: why well treated teeth can fail. *Int Endod J* 2001; 34:1-10.
6. Siqueira JF Jr, Rocas IN, et al. Chemo mechanical reduction of the bacterial population in the root canal after instrumentation and irrigation with 1%, 2.5%, and 5.25% sodium hypochlorite. *J Endod* 2000; 26:331-4.
7. Siqueira JF Jr, Lima KC, et al. Mechanical reduction of the bacterial cell number inside the root canal by three instrumentation techniques. *J Endod* 1999; 25:332-5.
8. Pettiette MT, Delano EO, Trope M. Evaluation of success rate of endodontic treatment performed by students with stainless steel K-files and nickel titanium hand files. *J Endod* 2001; 27:124-7.
9. Sjogren U, Figdor D, et al. Influence of infection at the time of root filling on the out come of endodontic treatment of teeth with apical periodontitis. *Int Endod* 1997; 30:297-306.
10. Trope M. Flare up rate of single visit endodontics. *Int Endod J* 1991; 24:24-7.
11. Pekruhn RB. The incidence of failure following single visit endodontic therapy. *J Endod* 1986; 12:68-72.