



Single Visit Endodontics Revisited

Dental Science

| | |
|---------------------------|---|
| Dr. Akriti Goel | Senior Resident Department of Conservative Dentistry & Endodontics, King George Medical University, Lucknow. |
| Dr. Isha Sajjanhar | Senior Resident Department of Conservative Dentistry & Endodontics, King George Medical University, Lucknow. |
| Dr. Aseem Tikku | Professor & Head Department of Conservative Dentistry & Endodontics, King George Medical University, Lucknow. |
| Dr. Anil Chandra | Professor Department of Conservative Dentistry & Endodontics, King George Medical University, Lucknow. |

ABSTRACT

Root canal treatment historically was performed in multiple visits mainly to ensure sterility of root canal system prior to obturation. To ensure complete sterilization of the root canal system intracanal medicaments were used. In addition to killing bacteria, these agents were found to be highly irritating to the peri-radicular tissues. Overzealous use of these medicaments led to postoperative complications. This led to the debate if root canal treatment could be completed in a single visit and overcome the disadvantages associated with multi visit treatment. This article highlights the clinician's ability and experience to perform single visit endodontics, the necessity of proper time and auxiliary utilization, the importance specific case selection, indications and contraindications, advantages and disadvantages of single visit endodontics.

KEYWORDS:

Single visit endodontics, post operative complications, non vital pulp.

INTRODUCTION

"Single-visit endodontics", is defined as "the conservative non surgical treatment of an endodontically involved tooth consisting of complete biomechanical cleansing, shaping, and obturation of the root canal system during one visit".¹ In the era of modern endodontics, it is important to view single visit endodontics as a supplemental procedure that compliments total patient care. It is not a technique that can totally replace multivisit procedure. Both single and multivisit treatment form total endodontic treatment spectrum. The clinician should wisely choose the technique that best fits patient's circumstances.

The concept of completing endodontic treatment in one visit is not new. In the last few years it has evolved from just an empirical technique to an acceptable treatment procedure for specific endodontic problems.²

OLIET'S CRITERIA FOR CASE SELECTION

Oliet's criteria for case selection state that positive patient acceptance, sufficient treatment time available to complete the procedure. Exclusion of tooth with acute symptoms where drainage via the root canal was established and those teeth with persistent, continuous flow of exudate. Exclusion of tooth associated with anatomical difficulties like calcified canals, fine tortuous canals or bifurcated canals. Procedural difficulties such as ledge formation, blockage, perforation and inadequate fill.³

Single visit procedure is a preferred treatment alternative when there is difficulty in maintaining inter appointment seal of the canal system from the oral cavity. Teeth with sub gingival breakdown, teeth with multiple coronal walls missing, and teeth with full coverage that have decay below the margins of their finished restorations would fall into this category. Single visit procedures can be used to eliminate the potential problem of inter-appointment contamination and/or flare ups due to leakage or complete loss of the temporary seal.⁴ Teeth containing vital pulps with pulp exposures caused by trauma, caries or mechanical reasons and teeth that exhibit clinical symptoms to heat or cold stimuli but not percussion.

Maxillary anteriors involved in trauma which resulted in horizontal fracture of the crown at the gum line must be treated in one visit as they pose aesthetic as well as isolation problems if treated in the conventional multivisit manner.⁵ Cases requiring endodontics for restorative reasons without any pathologic pulpal exposure can also be treated in a single visit.⁶ These include teeth used for over denture abutments, to be used for full jacket crown, teeth with severe coronal breakdown that cannot retain a restoration due to severe loss of tooth structure. Asymptomatic nonvital pulp is the most controversial situation for one visit endodontics. Clinical research on this subject have concluded that there is no greater incidence in postoperative pain when comparing single with multivisit procedures performed on teeth containing non vital pulps with and without the presence of associated periapical radiolucency. Also, teeth with nonvital pulps associated with sinus tract appear is least likely to cause post operative discomfort.⁷

Although there are many indications of one-visit endodontics, there are also a number of contraindications. Teeth with periapical symptoms such as the presence periapical tenderness to percussion, with or without associated swelling in teeth containing vital or nonvital pulps. Painful, necrotic teeth with no sinus tract for drainage, teeth with severe anatomic anomalies or cases with procedural difficulties, asymptomatic non vital molars with periapical radiolucencies and no sinus tract, patients who has acute apical periodontitis with severe pain on percussion, most retreatment cases, teeth with anatomic problems, receded pulp chambers, calcified canals, sharply curved canals, bifurcated canals and dilacerations, presence of a nonvital pulp, open to the oral cavity and teeth exhibiting copious amounts of exudate.⁸

The advantages of single visit endodontics are familiarity with the internal anatomy, canal shape, and contour which facilitates obturation. It eliminates inter-appointment contamination and flare-ups due to leakage or loss of the temporary seal in severely broken down teeth. There is no risk of losing important land marks. Teeth are ready sooner for final restoration, diminishing the risk of a fracture, necessitating extraction. It allows the practitioner to

immediately use the canal for retention of a post to construct an aesthetic temporary. It is time saving for the patient and the practitioner. Patients' pre appointment anxiety and post operative discomfort are limited to one episode. There is no repetitive or additional anaesthetic injection, no replacement of rubber dam required. It is more economic.⁹

Single visit endodontics is also associated with various disadvantages. Clinician and patient fatigue due to extended one appointment operating time. No opportunity to place an intracanal medicament. No opportunity to reevaluate tissue responses following treatment procedures. There is increased stress on TMJ musculature resulting in patient discomfort. In the event of a flare up, the emergency procedures for drainage are complicated, since artificial fistulation or the removal of root canal fillings are needed. Greater care in diagnosis and case selection as single visit procedures are not considered appropriate for every endodontically involved teeth. Post operative pain of greater magnitude and frequency when the periapical tissues are insulted through over instrumentation and overfilling.¹⁰

Intensity and frequency of post operative pain and success rate has been a the most debated questions for comparing single and multiple visit endodontics. Clinical research regarding these issues have concluded that Post operative pain occurs if there is extension of debris, poor coronal seal and/or over instrumentation.¹¹ The reported incidence of post operative pain following single and multi visit endodontic treatment varies considerably. However, most studies show that one visit root canal procedure does not produce more pain than multivisit ones.¹² An important consideration here is the apical extrusion of canal contents that may occur during cleaning and shaping procedures. Contaminated material, such as dentine chips, microorganisms, remnants of pulp tissue or necrotic debris can be pushed into the periapical region causing inflammation, pain and swelling.¹² Post operative Pain might also be caused by incorrect calculation of working length. Over instrumentation causes mechanical injury to periapical tissue causing pain.¹³ Other probable cause of post pain is poor coronal seal following obturation which enhances the periapical irritation by seepage of micro organisms and its toxins to the periapical area. Endodontists and clinical researchers have found that single visit endodontics is associated with fewer flare ups and decrease incidence of pain.¹⁴ This could be attributed to the fact that:

- 1) Bacteria and other irritants are not allowed to remain in the empty canal isolated from the healing system.
- 2) Deletion of bacterial ingress from a leaky restoration, lateral canal or caries.

There is no substantial difference in the success rate of one and two visit endodontic treatments. Under controlled circumstances including accurate diagnosis, proper case selection and skilled treatment technique post operative sequel and healing did not differ significantly.¹⁵

RECENT ADVANCES THAT ASSISTANT IN PERFORMING SINGLE VISIT ENDODONTIC THERAPY INCLUDES

- 1) Use of direct digital radiography, radiovisiography
- 2) Use of surgical microscope to have a clear image of the root canal anatomy in very minimal time.
- 3) Use of apex locators help in faster working length determination
- 4) Crown down technique is preferred because of less chance of pushing debris and bacteria into the periapical area and also for easier preparation of the apical portion of the canal.
- 5) NiTi rotary instrumentation and ultrasonic will aid in rapid canal preparation

6) Simultaneous use of NaOCl and H₂O₂ irrigants help in faster removal of debris because of effervescence action

7) Newer thermo-plasticized injectable gutta – percha can assist in rapid obturation.

SUMMARY AND CONCLUSION

As a new philosophy of treatment, its use grows out of a full understanding of fundamental endodontic principles by the experienced practitioner. It is only after considering all of the indications and contraindications in each case on an individual basis that a decision should be made as to whether or not it can be completed in a single visit.

Once a high level of competence is attained, one visit endodontics can be successfully performed if well skilled clinicians choose their cases carefully and adhere to basic endodontic principles.

The evidence to date would indicate that there is no indicate that there is no increase in post operative pain or decrease in healing when one visit is compared with multivisit endodontics. Add to these factors the advantages of fewer patient visits, reduction of inter-appointment problems a decrease in anterior aesthetics problems as well as decrease in cost to the patient, and one can readily appreciate the valuable addition one visit endodontics can make to the practice of dentistry.

REFERENCES

1. Ashkenaz PJ. One-visit endodontics. *Dent Clin North AM* 1984;28:853-63.
2. Figini L, Lodi G, Gorni F, Gagliani M. Single versus multiple visits for endodontic treatment of permanent teeth: A Cochrane review. *J Endod* 2008;34:1041-47.
3. Oliet S. Single-visit endodontics: A clinical study. *J Endod* 1983;9:147-52.
4. Wang C, Xu P, Ren L, Dong G, Ye L. Comparison of post-obturation pain experience following one-visit and two-visit root canal treatment on teeth with vital pulps: a randomized controlled trial. *Int Endod J* 2010 Aug;43:692-7.
5. El Mubarak AH, Abu-bakr NH, Ibrahim YE. Postoperative pain in multiple-visit and single-visit root canal treatment. *J Endod* 2010 Jan;36:36-9.
6. Al-Negrish AR, Hababeh R. Flare up rate related to root canal treatment of asymptomatic pulpally necrotic central incisor teeth in patients attending a military hospital. *J Dent* 2006;34:635-40.
7. Oginni A, Udoye CI. Endodontic flare-ups: comparison of incidence between single and multiple visits procedures in patients attending a Nigerian teaching hospital. *Odontostomatol Trop* 2004;27:23-7.
8. A Gustavo, M Eduardo, S Alexandre, Bueno C, Nowakowski A, Cunha R. Influence of Irrigating Solution on Postoperative Pain Following Single-Visit Endodontic Treatment: Randomized Clinical Trial. *J Can Dent Assoc* 2010;76-82.
9. Peters LB, Wesselink PR. Periapical healing of endodontically treated teeth in one and two visits obturated in the presence or absence of detectable microorganisms. *Int Endod J* 2002;35:660-7.
10. Weiger R, Rosendahl R, Löst C. Influence of calcium hydroxide intracanal dressings on the prognosis of teeth with endodontically induced periapical lesions. *Int Endod J* 2000;33:219-26.
11. Ørstavik D, Qvist V, Stoltze K. A multivariate analysis of the outcome of endodontic treatment. *Eur J Oral Sci* 2004;112:224-30.
12. Vince A, Peneis, Patrick I, Fitzgerald, Mohamed I, Fayad, Christopher S, Wenckus, Ellen A, BeGole, Bradford R, Johnson. Outcome of One-visit and Two-visit Endodontic Treatment of Necrotic Teeth with Apical Periodontitis: A Randomized Controlled Trial with One-year Evaluation. *J Endod* 2008;34:251-257.
13. DiRenzo A, Gresla T, Johnson BR, Rogers M, Tucker D, BeGole EA. Postoperative pain after 1- and 2-visit root canal therapy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;93:605-10.
14. Ghodusi J, Javidi M, Zarrabi MH, Bagheri H. Flare-ups incidence and severity after using calcium hydroxide as intracanal dressing. *NY State Dent J* 2006;72:24-8.
15. Kalhor F and Mirza A. A Study of Flare-ups Following Single-Visit Root Canal Treatment in Endodontic Patients. *Journal of the College of Physicians and Surgeons Pakistan* 2009;19:410-412.