Single visit Endodontic Treatment

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Single visit Endodontic treatment

- The concept of a single-visit root canal treatment was described as early as the 1880s.
- There were reports on immediate root filling describing the criteria for success based on manner of mechanical cleaning and the method of removing the bacteria origins from the canal system.
- The treatment technique used at that time were primitive, and the success rate of single visit root canal treatment was low.

Dodge JS. 1887, Kells CE. 1887
Turner WJ. 1901, Hofheinz RH. 1892

Single visit Endodontic treatment

- The single visit treatment was bought back in the 1950s by Ferranti, who advocated the hydrogen peroxide for irrigation.
- Ferranti was able to describe how the most important criteria for achieving successful result were the **proper shaping and cleaning of the root canals.**
- In 1970, Tosti reported a satisfactory result in clinical study using single visit approach.

Ferranti P. 1959, Tosti A. 1970

Single visit Endodontic treatment

- The key to endodontic success was described by Gutmann as the debridement and neutralization of any tissue, bacteria or inflammatory products.
- The concept underlying single visit technique as described by Oliet.
  1. An accurate diagnosis
  2. Proper case selection*
  3. Use contemporary endodontic techniques**

Wong WY, Zhang C, Chu C. A systemic review of nonsurgical single-visit versus multiple-visit endodontic treatment. *Clinical, Cosmetic and Investigational Dentistry* 2014:6 45-56

Single visit Endodontic treatment

Case selection* (Oliet S. 1983)

1. Positive patients acceptance
2. Sufficient available time to complete the procedure completely
3. Absence of acute symptoms requiring drainage via canal
4. Absence of anatomical obstacles (calcified canal, bifurcated)

Single visit Endodontic treatment

- The tooth is nonvital and there is acute inflammation, single visit endodontic treatment should not be recommended.
- Patients who have temporomandibular disorder and/or who cannot endure long treatment period may also not be suitable for single visit endodontic treatment.

Rudner et al. 1981

Single visit Endodontic treatment

Contemporary endodontic treatment includes the following five principles**

1. Use of aseptic technique
2. Cleaning the canals thoroughly and mechanically with chemical agents
3. Shaping the root canals for ease of obturation
4. Obturation to achieve a tight seal of the root canals
5. Proper restoration of the tooth to prevent coronal leakage.

Grossman LI. 1967

Advantages

- Reduce number of appointment
- Reduce patient discomfort and risk associated with local anesthesia
- Minimize the possible chance of iatrogenic errors
- No need for provisional restoration between appointment and thus no bacteria contamination
- Allow for resumption of the tooth function after treatment

Disadvantage

- Time restraints and causes fatigue in both the clinician and the patient

Single visit Endodontic treatment

01 Studies on postoperative complications of single visit treatment

02 Studies on healing and success rate of single visit treatment

03 Histobacteriologic Study

01

Studies on postoperative complications of single visit treatment

Authors	Main finding
• Oliet S. 1983	No significant difference on postoperative pain between the two groups
• Ruder et al. 1981	No significant difference in the incidence and severity of postoperative pain between two group
• DiRenzo et al. 2002	No difference in postoperative pain between two groups
• El Mulbarak 2010	No significant difference between the two groups
• Wang et al. 2010	No significant difference on the incidence and severity of postoperative pain between the two groups
• Risso et al. 2008	The frequencies of postoperative pain were 10.5% and 23% for the single visit and multiple visit, which were of significant difference
• Albashaireh et al. 1998	Multiple visit treated and non vital teeth had more postoperative pain. Age, sex, pulpal vitality, tooth type and preexisting pain were not found to be significant factors.
• Imura et al. 1995	There was a significantly higher incidence of flare up with multiple visit than with single visit treatment
• Roane et al. 1983	Multiple visit treatment had a greater incidence of postoperative pain
• Oginni et al. 2004	Higher incidences for postobturation pain were observes for single visit treatment than for multiple visit
• Yoldas et al. 2004	Multiple visit root canal treatment was more effective in completely eliminating pain than was single visit treatment of previously symptomatic teeth.

Wong WY, Zhang C, Chu C. A systemic review of nonsurgical single-visit versus multiple-visit endodontic treatment. *Clinical, Cosmetic and Investigational Dentistry* 2014:6 45-56

Postoperative Complications

- Postoperative intolerable pain or swelling are collectively described as flare-up.
- There was no significant difference in flare-up rates between single-visit and multiple-visit root canal treatment. *(Akbar et al. 2013, Dorasani et al. 2013)*
- The prevalence of flare-up after single-visit treatment in the published literature was none to minimal, at 3%. *(Eleazer et al. 1998)*
- **There was no significant difference in postoperative complications between single-visit and multiple-visit endodontic treatment.**

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02

Studies on healing and success rate of single visit treatment

Authors	Main finding
• Paredes-Vieyra et al. 2012	No significant difference in healing results between the two groups. Single-visit treatment can be successful multiple-visit treatment.
• Penesis et al. 2008	No significant difference in success rates between the two groups
• Molander et al. 2007	There was no significant difference in term of healing results between single-visit and multiple-visit
• Waltimo et al. 2005	No significant differences in periapical healing were observed between the two groups
• Kvist et al. 2004	No significant difference between the two groups
• Peters et al. 2002	No significant difference in success rate between the two group
• Trope et al. 1999	The two groups had a similar success rate
• Field et al. 2004	The overall success rate was 89.2% . No significant differences based on sex, age, arch or operators Anterior teeth were treated more successfully than posterior teeth
• Pekruhn et al. 1986	The overall success rate was 95%. The incidence of failure was higher with retreatment and presence of apical periodontitis

- **The success rate of single-visit and multiple-visit endodontic treatment were similar. There was no significant difference in the success rate of single-visit and multiple-visit treatment.**

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03

Histobacteriologic Study

Single visit Endodontic treatment

- Several studies have evaluated the intracanal antimicrobial activity of chemomechanical preparation by using **NaOCl as the irrigant in concentrations ranging from 0.5-5%**, but most of them demonstrated that **40-60% of canals still exhibit detectable cultivable bacteria.**
- The use of interappointment intracanal medication has been recommended to supplement the antibacterial effects of chemomechanical procedures and maximize bacteria reduction.
- **Calcium hydroxide** is used intracanal medication, its **effectiveness in significantly increasing the number of culture-negative root canals** after chemomechanical preparation.

Vera J, Loghin S, Cruz AG. One- versus Two-visit Endodontic Treatment of teeth with Apical Periodontitis: A Histologic Study. J Endod 2012;38:1040-52

Clinical Research

One- versus Two-visit Endodontic Treatment of Teeth with Apical Periodontitis: A Histobacteriologic Study

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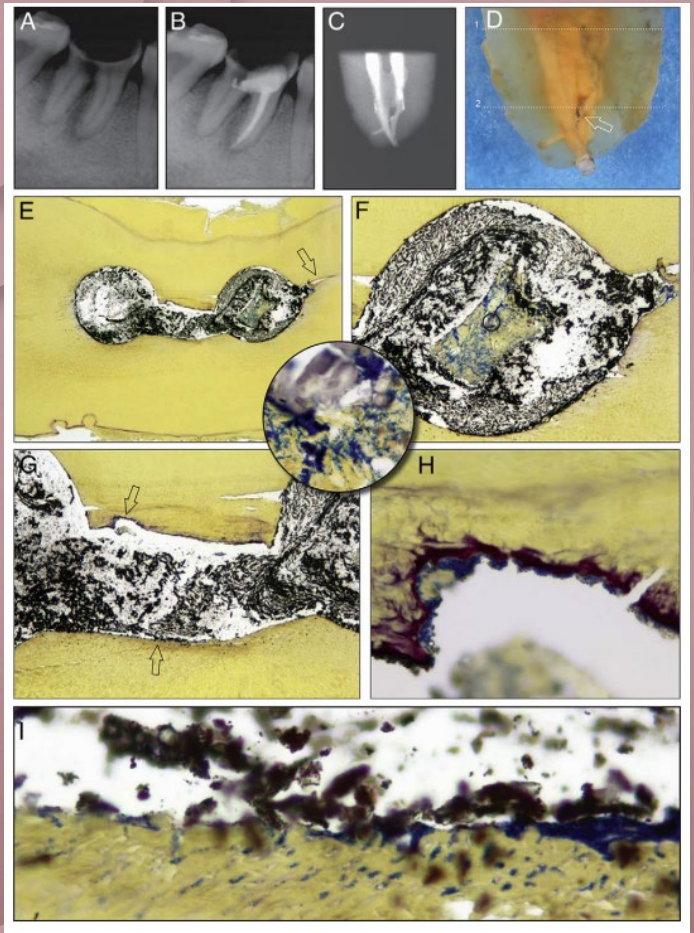
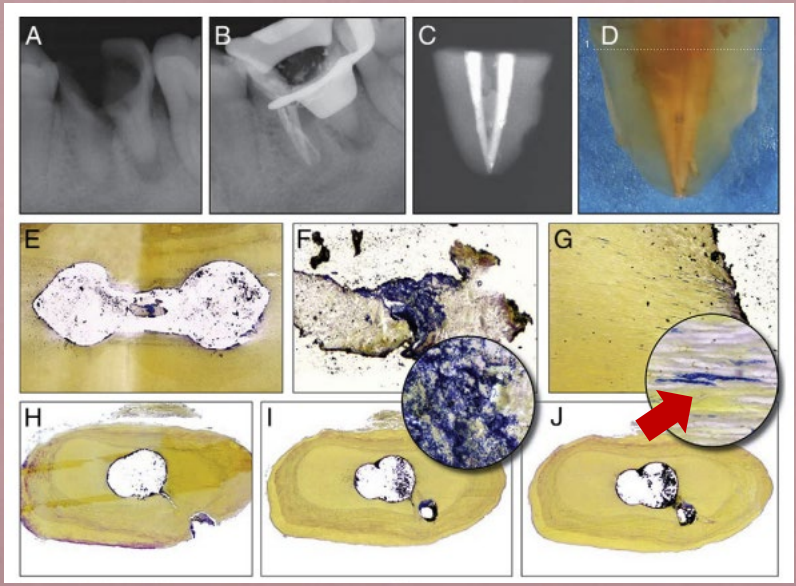
Abstract

Introduction: This study analyzed the *in vivo* microbiological status of the root canal systems of mesial roots of mandibular molars with primary apical periodontitis after 1- or 2-visit endodontic treatment.



Microorganisms were observed in the isthmuses



Microorganisms were observed in the dentinal tubules

Conclusion

- Residual bacteria were more commonly observed and in higher abundance in ramifications, isthmus and dentinal tubules of teeth treated without interappointment medication.
- **The two visit protocol with an interappointment medication with calcium hydroxide resulted in improved microbiological status of the root canal system when compared with single visit protocol.**

Summaries

- There was no significant difference in postoperative complications between single-visit and multiple-visit endodontic treatment.
- The success rate of single-visit and multiple-visit endodontic treatments had no significant difference.
- There was no significant difference in radiographic evidence of periapical healing between one-visit therapy and two-visit therapy.
- The two visit endodontic treatment with an intracanal medication with calcium hydroxy improved microbiological status of root canal systems.

Thank You

Outcome of One-visit and Two-visit Endodontic Treatment of Necrotic Teeth with Apical Periodontitis: A Randomized Controlled Trial with One-year Evaluation

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Abstract

The choice of one-visit versus two-visit root canal therapy for necrotic teeth with apical periodontitis is a source of current debate. The primary objective of this randomized controlled clinical trial was to compare radiographic evidence of periapical healing after root canal therapy completed in one visit or two visits with

Materials & Methods

- The inclusion criteria were radiographic evidence of apical periodontitis (minimum size ≥ 2*2 mm) and diagnosis of pulpal necrosis confirmed by negative response to cold and electrical pulp test.
- Patients were excluded were younger than 18 years, pregnant, history of antibiotic use within the past month, diabetic, or the tooth had been previously accessed.

Materials & Methods

- Canal instrumentation was performed with 0.06 taper K3 Ni-Ti rotary files in crown down technique. Canal were irrigated with 5 ml 5.25% sodium hypochlorite after each instrumentation cycle.
- After completion of canal instrumentation, all canals were irrigated with 5 ml 17% EDTA followed by final irrigation with 5 ml 5.25% NaOCl.
- Teeth in group I were obturated by using warm vertical condensation with gutta percha and Kerr EWT sealer.
- Teeth in group II, calcium hydroxide was filled in all canals. Patients were scheduled at least 2 weeks but no more than 4 weeks after initial appointment.

Outcome Measures & Data Analysis

- The primary outcome measure the change in apical bone density at 12 months. The PAI was used to evaluate radiographic healing.
- The secondary outcome measure the presence of clinical sign at 12 months. (spontaneous pain, sinus tract, swelling, mobility, periodontal probing depth, sensitive to percussion & palpation)

	Immediate post-op - mean PAI and standard deviation	12 month evaluation - mean PAI and standard deviation	Change in PAI score with 95% confidence interval
Group 1 (n=33)	3.61 ± 0.93	2.27 ± 0.76	1.34 (1.02 to 1.64)
Group 2 (n=30)	3.53 ± 0.97	2.30 ± 0.70	1.23 (0.88 to 1.58)

Figure 5. PAI score at immediate postoperative and 12-month evaluation for group 1 (one-visit randomized controlled trial) and group 2 (two-visit root canal therapy).

- Both groups exhibited a statistically significant decrease in PAI score between the immediate postoperative and 12 months evaluation.
- There was no statistically significant difference between groups at either the immediate postoperative or 12 month evaluation.

	Healed (PAI ≤ 2)	Not healed (PAI ≥ 3)	Improved (decreased PAI)	Unchanged (same PAI)	Worse (increased PAI)
Group 1 (n=33)	67% (n=22)	33% (n=11)	85% (n=28)	12% (n=4)	3% (n=1)
Group 2 (n=30)	70% (n=21)	30% (n=9)	80% (n=24)	17% (n=5)	3% (n=1)

Figure 6. Proportion of teeth healed, improved, unchanged, or worse in each group at 12-month evaluation.

- There was no statistically significant difference between group.

Conclusions

- 12 months after initial nonsurgical root canal therapy on necrotic teeth with apical periodontitis, there was no significant difference in radiographic evidence of periapical healing between one-visit therapy and two-visit therapy.

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CLINICAL ARTICLES

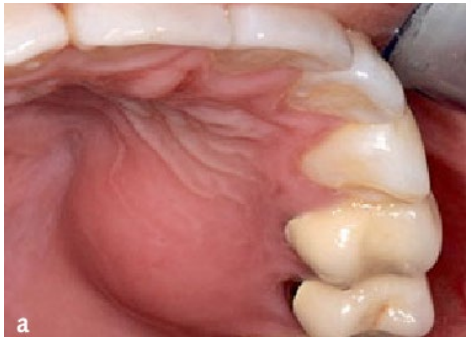
Effective One-visit Therapy for the Acute Periapical Abscess

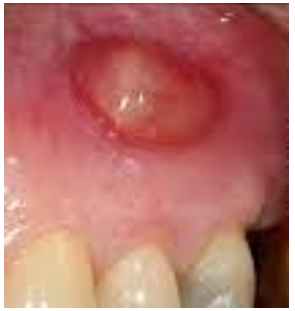
Tratamiento Efectivo en una Sola Sesion en Abcesos Periapicales Agudos

Denny W. Southard, AS, DDS, MSD, and Thomas P. Rooney, DDS

Materials & Methods

- Patients presented with endodontically involved teeth with associated soft tissue fluctuant swelling.
- Fluctuant swelling is defined as swollen soft tissue which when palpated gives the sensation of a fluid-filled space.
- Only teeth with one or two canals were included. The sample size included 19 such patients.





Materials & Methods

- Incision and drain via soft tissue, a sterile penrose drain was placed.
- Endodontic treatment : instrumentation with K-file and canal irrigation with 5.25% sodium hypochlorite,
- An oversized standardized gutta-percha cone was fitted using chloroform to within 1 mm of the apex and coated with sealer, replaced into the canal and vertically condensed using heat.
- Prescribed 7 days of antibiotics (Penicillin V, 500 mg every 6 h).

Materials & Methods

- The patient was instructed to return in 72 h for evaluation of swelling and for drain removal.
- Patients were recalled at 3, 6 and 12 months to assess via radiography and physical examination.
- The procedure was defined as successful if

  (a) the patient's signs and symptoms did not exacerbate

  (b) at 1 year recall, the tooth was asymptomatic and had radiographic evidence of a decease in lesion size.

Results

- No patients experiences exacerbation of swelling or pain.
- Twelve patients reported either a significant decrease or complete absence of pain at 24 h postoperatively.
- Sixteen patients returned for 72 h for drain removal, 13 patients had total resolution of swelling and 3 patients had reduction in size of the initial swelling and the drain was removed at day 7.
- After 1 year, 11 patients were considered to be treated successfully according to the recall criteria.

Conclusion

- The teeth with acute apical abscess which were treated by single visit endodontic treatment showed completely resolved and radiographic evidence of reduction in lesion size.

An effective incision and drainage relieves periapical pressure and allows instrumentation of a dry root canal.