

<https://doi.org/10.48047/AFJBS.6.15.2024.14292-14297>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

Single-visit root canal treatment for mandibular first molars: managing asymptomatic irreversible pulpitis effectively: a case report

Eka Fatmawati, Nurhayaty Natsir

Department of Conservative Dentistry, Faculty of Dentistry
Hasanuddin University, Makassar, Indonesia

Author Correspondence: Nurhayaty Natsir, Department of Conservative Dentistry, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia; Email: nurhayati_natsir@yahoo.co.id

Volume 6, Issue 15, Oct 2024

Received: 15 Aug 2024

Accepted: 25 Sep 2024

Published: 21 Oct 2024

doi: [10.48047/AFJBS.6.15.2024.14292-14297](https://doi.org/10.48047/AFJBS.6.15.2024.14292-14297)

Abstract

Introduction: Single-visit root canal treatment has gained significant attention as a promising approach for efficiently managing endodontic cases as it can reduce treatment time and increase patient comfort. However, its success in treating complex cases, especially molars, still needs to be evaluated. Single-visit root canal treatment is a non-surgical conservative treatment of teeth with irreversible pulp inflammation. This technique aims to do the full root canal procedure, including cleaning, shaping, and obturation in one sitting.

Case Illustration: A female patient, 18 years old, complained of caries in her mandibular left first molar and felt pain when drinking cold water. Clinical examination showed caries on tooth #36, with normal response to vitality and percussion. The radiological examination revealed a normal periapical area. The diagnosis was asymptomatic irreversible pulpitis and treated with a single-visit root canal treatment. Four root canal preparations were performed using a rotary file, obturated with the single cone technique, followed by zirconia onlay restorations at the next visit.

Conclusion: Single-visit root canal treatment of mandibular molars proved effective and efficient. Benefits in reduced treatment time, increased patient comfort, and comparable success rates with multi-visit treatments. The treatment performed in this case was clinically and radiologically successful.

Keywords: Single visit root canal treatment, asymptomatic irreversible pulpitis, zirconia onlay

Introduction

The goal of root canal therapy is to eliminate diseased pulp. The root canal system's obturation, shape, and cleansing are essential to its success. To accomplish this, a root canal treatment typically requires multiple visits to completely disinfect the canal.^{1,2}

New technologies are constantly evolving and data from several studies show that root canal treatment can be performed in a single visit. This is a transformation of the development of instruments in the field of endodontics such as rotary instruments, digital radiography, magnification, and ultrasonic devices that can produce maximum treatment procedures that can be performed in a single visit.^{3,4}

A single visit can be used for cleaning, shaping, and obturation of the root canal system. It is classified as a conservative, non-surgical treatment. This treatment is indicated in anatomically uncomplicated asymptomatic teeth, anterior crown fractures requiring aesthetics, endodontic surgery, non-vital teeth with sinus tract, exposed pulp due to trauma or caries, and patients who are physically compromised and unable to visit the clinic frequently. This case report aims to provide an overview of a mandibular left first molar root canal treatment performed in a single visit, with a diagnosis of asymptomatic irreversible pulpitis.^{5,6}

Case Illustration

An 18-year-old woman came to Hasanuddin University Dental Hospital with complaints of a cavity in her mandibular left tooth and pain when eating and drinking cold drinks. Clinical examination showed profunda caries in tooth #36. The vitality test was positive and the percussion was negative. A radiographic examination showed a normal periapical area. The diagnosis was asymptomatic irreversible pulpitis. The treatment plan was a single-visit canal treatment. At the first visit, subjective, objective examination, clinical, and radiographic photographs were taken (Figure 1), diagnosis and treatment plan were determined and the patient signed informed consent before treatment.



Figure 1. Initial clinical and radiographic photographs

Examination of the patient's vital signs showed a blood pressure of 110/70 mmHg, followed by administration of local anesthesia and cleaning of carious tissue, then rubber dam

insertion. Opening the access cavities, cleaning the pulp chamber, and extirpating the pulp tissue. Working length measurements using K-file #10 with an apex locator were confirmed with radiographs (Figure 2).



Figure 2. Determination of working length clinical and radiographic photographs

Working lengths for distobuccal 18 mm, distolingual 17 mm, mesiobuccal 18 mm, and mesiolingual 18 mm. Root canal preparation using a rotary file (ProTaper Gold, Dentsply) to size F2 and irrigated using 2.5% sodium hypochlorite, 17% EDTA, and rinsed with sterile distilled water. The next step was to try in gutta-percha (Figure 3). Root canal filling using a single cone technique (Figure 4). Coronal closure using ionoseal (Voco, Germany) and covered with a temporary restoration.



Figure 3. Try-in gutta percha clinical and radiographic photographs



Figure 4. Obturation radiograph photograph

The second visit was controlled, the percussion test was negative, and the radiographic examination was normal. Preparation for zirconia onlay was done (Figure 5), followed by temporary onlay insertion. The third visit was control and zirconia onlay insertion (Figure 6). Subsequent controls revealed no complaints and the patient was comfortable with her restoration.

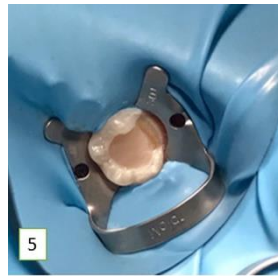


Figure 5. Onlay preparation photograph



Figure 6. Onlay zirconia insertion clinical and radiographic photographs



Figure 7. Before and after root canal treatment clinical photographs

Discussion

Single-visit root canal treatment can be defined as a non-surgical conservative treatment that includes cleaning, shaping, and obturation in one appointment. The main indication is irreversible pulpitis or pulp necrosis due to caries or trauma, as in this case report, tooth 36 had asymptomatic irreversible pulpitis due to caries and received single-visit root canal treatment. The results obtained from this treatment were the same as those of multiple visits root canal treatment, which can eliminate post-treatment pain, swelling or sinus tract and on radiographic examination showed improvement in periapical tissue.^{2,7,8}

Many studies have compared single-visit root canal treatment with multiple visits. The areas studied include post-treatment pain, clinical evaluation, and periapical radiographs. The study by Fonzar F et al. showed that single-visit root canal treatment had less post-treatment pain than multiple visits, while the study by Schwendicke F et al. showed no significant difference in post-treatment pain. Several other researchers also evaluated clinical and radiographic conditions with results where there was no significant difference between single-visit and multiple-visit treatments.^{3,9,10}

In this case, the patient did not feel any post-treatment pain, the tooth could function properly and the patient felt comfortable with the results. Therefore, knowledge is needed to determine the indications and contra-indications of single-visit root canal treatment.

Conclusion

Single-visit root canal treatment of mandibular molar teeth is proven to be effective and efficient in relieving patients' pain complaints as well as shorter treatment procedures.

Mandatory:

Conflict of interest: Authors state no conflict of interest.

Funding: None declared

Ethics: The conducted research is not related to either human or animal use.

Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission

References

1. Makanjuola JO, Oderinu OH, Umesi DC. Treatment Outcome and Root Canal Preparation Techniques: 5-Year Follow-Up. *Int Dent J.* 2022;72(6):811-818. doi:10.1016/j.identj.2022.08.008
2. Geethanjali R, Kumar N, et al. Single visit endodontics. *Indian Journal of Conservative and Endodontics* 2021;6(3):147–151. doi:10.18231/j.ijce.2021.032
3. Bansode PV, Pathak SD, et al. Single Versus Multi- visit Endodontic Treatment of Teeth with Periapical Pathology: A Critical Review.. *Journal of Dental and Medical Sciences (IOSR-JDMS)* Volume 18, Issue 8, 2019 : 33-38. DOI: 10.9790/0853-1808013338.
4. Rather SH, Singh S, et al. Single visit endodontic therapy: a review. *International Journal of Scientific Development and Research.* Volume 7, Issue 4, 2022 : 158-160
5. Berman LH, Hargrevash KM. Cohen's pathway of the pulp. 12th edition, 2021 : 151
6. Praharaj N, Naik D. Endodontic Therapy in Single Visits. *Indian Journal of Forensic Medicine & Toxicology.* 2020, Vol. 14 Issue 4 : 8683-8686
7. Mergoni G, Ganim M, Lodi G, Figini L, Gagliani M, Manfredi M. Single versus multiple visits for endodontic treatment of permanent teeth. *Cochrane Database Syst Rev.* 2022;12(12):CD005296. Published 2022 Dec 13. doi:10.1002/14651858.CD005296.pub4
8. Aishwarya T, Sheetal G et al. Role of single visit endodontics in contemporary dental practice – A review. *Indian Journal of Conservative and Endodontics* 2020, 5(4): 165-167. doi:10.18231/jijce.2020.041
9. Schwendicke F, Göstemeyer G. Single-visit or multiple-visit root canal treatment: systematic review, meta-analysis and trial sequential analysis. *BMJ Open.* 2017;7(2):e013115. Published 2017 Feb 1. doi:10.1136/bmjopen-2016-013115
10. Lu Y, Liu Z, Huang J, Liu C. Therapeutic effect of one-time root canal treatment for irreversible pulpitis. *J Int Med Res.* 2020;48(2):300060519879287. doi:10.1177/0300060519879287