CASE REPORT

Effectiveness of single- versus multiple-visit endodontic treatment of two mandibular central incisors from the same patient

Fábio de Almeida-Gomes, DDS, MSc1; Bruno Carvalho-Sousa, DDS, MSc1; Mariana Carvalho Furtado-Leite, DDS2; Roberto Alves dos Santos, DDS, MSc, PhD1; and Cláudio Maniglia-Ferreira, DDS, MSc, PhD3

1 Department of Endodontics, University of Pernambuco, Pernambuco, Brazil
2 Specialist program of Odontopediatry, University of Ceará, Fortaleza, Brazil
3 Department of Endodontics, University of Fortaleza, Fortaleza, Brazil

Abstract

The aim of this report is to describe the treatment of two mandibular incisors of the same patient with apical periodontitis following dental trauma. Tooth 31 was treated by single-visit endodontic therapy while tooth 41 was treated by multiple-visit endodontic therapy. A 16-month postoperative radiograph was taken and showed repair.

Keywords
apical periodontitis, multiple-visits endodontic therapy, single-visit endodontic therapy.

Introduction

Apical periodontitis is caused by bacteria within root canals (1,2). Logically, the treatment of apical periodontitis should be bacterial eradication from the root canal. Thus, conventional root canal treatment aims primarily at the elimination of these bacteria (3).

There are essentially two techniques and treatment philosophies: single-visit endodontic therapy and multiple-visit endodontic therapy (dressing the canal for several weeks with calcium hydroxide).

In this report, we describe the treatment of two mandibular central incisors of the same patient with apical periodontitis following dental trauma: (i) tooth 31 was treated by single-visit endodontic therapy, and (ii) tooth 41 was treated by multiple-visit endodontic therapy.

Case report

An 18-year-old male patient with a non-contributory medical history was referred to our office complaining of discomfort associated with his mandibular central incisors. He reported trauma to the area 2 years previously.

Clinical examination revealed intact surrounding soft tissue but that the teeth were very sensitive to percussion and were unresponsive to applied Endo Ice (Hygienic, Corp., Akron, OH, USA).

A radiograph showed normal canal anatomy. Periradicular radiolucencies were associated with teeth 31 and 41 (Fig. 1A).

A diagnosis of infected necrotic pulp with acute exacerbation of a chronic periradicular periodontitis was made.

Tooth 41 was anaesthetised and isolated with a rubber dam. The canal was accessed. After cleaning, the length of the root canal was established using an electronic apex locator (Root ZX; J. Morita Inc. Kyoto, Japan). The root canal was prepared in a crown-down method. Sodium hypochlorite (2.5%) and EDTA (17%) solutions were used alternately as irrigants. When the preparation was completed, the canal was dried with paper points and a calcium hydroxide dressing was placed (Ultracanal, Optident, UK). Two weeks later, the dressing was removed and the root canal system was filled by the wave-of-condensation technique. Tagger’s technique was used for the backfilling using gutta-percha points and a root canal sealer (Endofill, Dentsply, Petropolis, Rio de Janeiro, Brazil) (Fig. 1B). On the same day, tooth 31 was anaesthetised and isolated with a rubber dam; the coronal access was prepared. The canal was instrumented similarly.
to the canal in tooth 41 and the canal was filled by the wave-of-condensation technique; Tagger's technique was used for the backfilling using gutta-percha points and a root canal sealer (Endofill) (Fig. 1B). Treatment of tooth 31 was thus completed in a single visit.

Follow-up radiographic examination at 4 months (Fig. 1C) postoperatively showed improvement of the periapical radiolucent area. The teeth were asymptomatic, with intact surrounding soft tissues. Clinical and radiographic findings indicated healing of the periapical lesions.

Follow-up radiographic examination at 16 months (Fig. 1D) postoperatively revealed total healing of the periapical lesions.

Discussion

In recent years, single-appointment endodontics has gained increased acceptance (4). Recent studies (5–7) have shown little or no difference in the quality of treatment or success rates between single- and multiple-visit root canal treatment.

However, Nair et al. (8) found that 14 of 16 (88%) mandibular molars that were treated in a single-visit endodontic treatment harboured intracanal microorganisms immediately after completion of the treatment. Other studies (9–11) have also recommended that endodontic treatment of non-vital teeth with infected root canals
should be completed in one session, without any intracana-
mal microbicidal dressing. Intraradicular microbes survi-
viving root canal treatment are argued to be entombed by
obturation of the root canal and die off as a result of inade-
quate nutrients (10). ‘These microbes may no longer
interfere with the periapical healing process’ (11). Accord-
ing to Sjögren et al (12), the periapical healing of some
teeth occurs even when microbes are present in the canals
at the time of obturation. Although this may imply that
the organism may survive post-treatment, it is possible
that the microbes may be present in quantities and viru-
lence that may be subcritical to sustaining the inflamma-
tion of the periapex, or that they remain in a location
where they cannot communicate with the periapical
tissues.

This article has presented a case report of two teeth,
from the same patient, with the same diagnosis, that were
treated differently. Tooth 41 was treated by multiple-visit
endodontic therapy whereas tooth 31 was treated by
single-visit endodontic therapy.

Conclusion
There was no significant clinical and radiographic differ-
ence between the endodontic treatment with single and
multiple visits in these teeth over the 16-month observa-
tion period.

References
exposures of dental pulps in germ-free and conventional
Influence on periapical tissues of indigenous oral bacteria
and necrotic pulp tissue in monkeys. Scandinavian J Dent
hydroxide intracanal dressings on the prognosis of teeth
with endodontically induced periapical lesions. Int Endod J
4. Cohen S, Burns R. Pathways of the pulp. 8th ed. St Louis,
5. Sathorn C, Parashos P, Messer HH. Effectiveness of single-
versus multiple-visit endodontic treatment of teeth with
apical periodontitis: a systematic review and meta-analysis.
6. Peters LB, Wesselink PR. Periapical healing of endodonti-
cally treated teeth in one and two visits obturated in the
presence or absence of detectable microorganisms. Int
7. Field JW, Gutmann JL, Solomon ES, Raakusin H. A clinical
radiographic retrospective assessment of the success rate of
82.
8. Nair PNR, Henry S, Cano V, Vera J. Microbial status of
apical root canal system of human mandibular first molars
with primary apical periodontitis after ‘one-visit’ endodon-
9. Pekrun RB. The incidence of failure following single-visit
10. Peters LB, Wesselink PR, Moorer WR. The fate and the role
of bacteria left in root dentinal tubules. Int Endod J 1995;
hydroxide intracanal dressings on the prognosis of teeth
with endodontically induced periapical lesions. Int Endod J
12. Sjögren U, Figdor D, Person S, Sundqvist G. Influence of
infection at the time of the root filling on the outcome of
endodontic treatment of teeth with apical periodontitis. Int