



Review

One appointment endodontic procedure on teeth with apical periodontitis: Is this a criterion for success? – A literature review

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ABSTRACT

One-appointment procedure is an endodontic therapy protocol that has been growing in popularity among clinicians and patients. It definitely brings many advantages in clinical management and in relating to the patients' needs. When accepting a one-appointment procedure the clinician assumes that the long term prognosis mirrors the multi-appointment procedure. The aim of this work is to analyze and evaluate if this assumption is correct when bacterial infection is present. The relevant literature on one-appointment versus multi-appointment endodontic treatment on teeth with apical periodontitis up to December of 2010 was reviewed using PubMed database searches. The literature was searched regarding the following topics: periapical healing, bacterial elimination, histological studies, bacterial endotoxins elimination and post-operative pain. An analysis of the treatment protocol and concept differences between both treatments and an overall discussion are also presented. There is a general agreement on the need of an effective bacteriological control. Although more studies are required to support the one- versus multiple-appointment procedure.

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Tratamento endodôntico em sessão única em dentes com periodontite apical: será isso um critério de sucesso? – Revisão de literatura

RESUMO

Os protocolos em sessões únicas têm crescido em popularidade entre clínicos e pacientes. Definitivamente traz algumas vantagens na gestão da clínica e relacionamento com os pacientes. Parte-se do princípio que quando se decide avançar para um protocolo em sessão única o clínico assume que o prognóstico a longo prazo é similar ao das sessões múltiplas.

Palavras-chave:

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O objetivo deste trabalho é analisar e avaliar se essa suposição está correta quando uma infecção bacteriana está presente. A literatura relevante sobre sessão única vs sessões múltiplas em tratamentos endodônticos em dentes com patologia apical até Dezembro de 2010 foi revista utilizando a base de dados da PubMed. A pesquisa da literatura focou os seguintes tópicos: cura de lesões apicais, eliminação bacteriana, estudos histológicos, eliminação de endotoxinas bacterianas e dor pós operatória. Uma análise entre as diferenças de protocolo e conceitos de ambos os tratamentos e uma discussão geral são também apresentados. Existe consenso relativamente à necessidade de um eficiente controlo bacteriano. No entanto, mais estudos são necessários para apoiar a sessão única versus sessões múltiplas.

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Introduction

During the past four decades there has been a tendency for choosing the one-appointment procedure instead of the multi-appointment procedure for root canal treatment.¹ It became a kind of a criterion of quality for the professionals who work in the endodontic field. But can it really be classified as a criterion of success? It is definitely a criterion of skills, but are those skills being used to achieve the maximum success in the outcomes of the treatments? Rather than debating the effectiveness of endodontic treatment based on number of appointments, we should focus on the biological aspects of treatment effectiveness.²

The best scientific evidence-based documented procedure for the best outcome in endodontic treatment is based on the maximum disinfection of the root canal system.³ Sjögren et al.⁴ have proposed the following protocol to achieve a reliable result: the full debridement, instrumentation and disinfection of the root canal done at the first appointment, followed by an intracanal application of a dressing of calcium hydroxide for one week and finally the obturation of the root canal system at the second appointment.

Reducing the number of visits to only one brings several practice management advantages. It is less stressful and only one anesthesia is needed, which makes it very well accepted by the patient, is less time-consuming, reduces the risk of inter-appointment contaminations, is less expensive and is more productive for the clinician. But the question is: is the same outcome achieved?

The purpose of this paper is to review some arguments that are the basis for both points of view. A literature search was performed on PubMed database up to December of 2010.

Treatment protocol and concept differences between one- and multi-appointment procedure

The presence of bacteria inside the root canal system results in the development of periapical lesions.⁵ Are both options, one or multiple appointments, similar concerning the elimination of those bacteria from the root canals?

The traditional multi-appointment protocol is based on the need to use extra disinfecting agents besides the irrigants used during the cleaning and shaping.⁴ Several intracanal dressings have been proposed, such as iodine potassium

iodide, camphorated p-monochlorophenol or chlorhexidine gel, but the most researched and widely used is the calcium hydroxide paste.⁶ There are two main advantages of the use of calcium hydroxide paste: the capacity to act as a physical barrier that blocks the coronal leakage of the temporary fillings, which inhibits the inter-appointment contamination; and the low solubility of the medicine, which allows the slow release of the hydroxyl ions, giving it a longer antimicrobial capacity and prolonging effectiveness for several weeks. In 2004, Law and Messer⁶ reviewed the published literature about the intracanal medication. It was part of the inclusion criteria for the study that all the papers should have microbiological sampling before the treatment (S1), after cleaning, shaping and irrigation (S2) and after canal medication (S3). Five studies in a total of 164 teeth were included in the research. At S2, 62% of the canals were bacteria positive, and at S3 27% still had bacteria growth. It was concluded that cleaning, shaping and irrigation are not capable of eliminating all the bacteria, and although calcium hydroxide was not fully efficient, it helped to reduce the bacteria remaining in the canal after the irrigation. The same conclusion was achieved in a meta-analysis by Sathorn et al.⁷

On the other hand the one-appointment protocol eliminates the intracanal medication. This option is based on the entomb theory.⁸ It is accepted that the cleaning, shaping and irrigation of the root canal system in one session is not enough to eradicate all the bacteria. It is acknowledged that the intracanal medication would improve the disinfection, but is also argued that those bacteria are reduced to a lower level that allows the success. The entomb theory defends that, after the obturation, a low concentration of the surviving bacteria remain inside the canal but stay imprisoned inside the dentinal tubules and isthmus, and with the lack of nutrients, these bacteria finally die.

Periapical healing

The simplest way to compare both treatment options is to analyze them using a healed or not healed outcome. The short- or long-term follow-up of the bone radiographic image and size of the lesion is the most commonly used technique to evaluate the healing, usually based on the PAI score developed by Orstavik et al.⁹

The number of studies that compare both techniques for a legitimate and credible follow-up time are not many compared to the mature evidence base that supports the use of

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