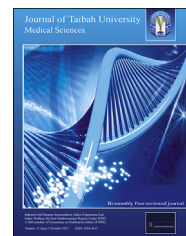




Taibah University

Journal of Taibah University Medical Sciences

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Review Article

Predictors, prevention, and management of postoperative pain associated with nonsurgical root canal treatment: A systematic review



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Received 26 January 2017; revised 19 March 2017; accepted 27 March 2017; Available online 9 May 2017

المخلص

من الممكن إنقاص آلام ما بعد الجراحة لمعالجة القناة الجذرية من خلال تطبيق التطورات الحديثة في التقنيات والمعدات لعلاج الجذور. إن هذه المقالة المرجعية تقدم المعرفة الحالية حول الألم لمعالجة القناة الجذرية غير الجراحية بما في ذلك توقع حدوث، والعوامل المرتبطة، وتأثيرات التطورات الحديثة، والعلاج. روجعت الأدبيات الطبية بين عامي ١٩٩٠م-٢٠١٦م باستخدام قواعد البحث PubMed, Cochrane, ScienceDirect. اشتملت الكلمات المفتاحية للبحث ألم ما بعد الجراحة، والعلاج غير الجراحي، وزيارة واحدة، والتطورات الحديثة في علاج الجذور، وعلاج ألم ما بعد جراحة الجذور. كما اشتملت المراجعة على الأبحاث الأصلية فقط بينما تم استبعاد المقالات الافتتاحية، والمراجعات، والملاحظات المختصرة، ومحاضر المؤتمرات، والرسائل إلى المحرر. وأسفر البحث الأولي عن ٤٩٤١ مقالة، تم تقييمها وتصنيفها وفقاً لمعايير الاختيار. وتوافقت ٦٥ مقالة مع معايير الاختيار، وتم تضمينها في هذه المقالة المرجعية. أظهرت النتائج حدوث ألم ما بعد معالجة القناة الجذرية غير الجراحية لدى ٣-٦٩.٣٪ من المرضى. وتم تحديد الكائنات الحية الدقيقة كمسببات أساسية لألم ما بعد العلاج، ولم يكن هناك فرق في ألم ما بعد الجراحة بين زيارة واحدة وعدة زيارات علاجية. تراوح ألم ما بعد الجراحة لعلاج القناة الجذرية من خفيف إلى معتدل، وحدث حتى عند تنفيذ الإجراءات على النحو الأمثل. وبالإضافة إلى ذلك، يعتبر علاج ألم ما بعد الجراحة غالباً مؤشراً على التميز السريري. قلل تطبيق التقنيات والأجهزة الحديثة في علاج الجذور من ألم ما بعد الجراحة. بالإضافة إلى ذلك، يمكن أن يستعمل وصف الأدوية بشكل مرن بحسب حدة الألم للسيطرة على ألم ما بعد علاج القناة الجذرية. إن تطبيق نتائج هذا البحث سوف يقلل من ألم ما بعد علاج القناة الجذرية ويحسن نتائج المرضى.

الكلمات المفتاحية: المسكنات؛ المعالجة اللبية؛ غير جراحي؛ ألم ما بعد الجراحة؛ القناة الجذرية

Abstract

Postoperative pain after root canal treatment can be reduced by applying recent advances in endodontic techniques and equipment. This systematic review includes current knowledge about pain after nonsurgical root canal treatment, including predictors, related factors, effects of recent advances, and management. A literature search was performed using the PubMed, ScienceDirect, and Cochrane Library databases for articles published between 1990 and 2016. Search keywords included postoperative pain, nonsurgical treatment, single visit, recent advances in endodontics, and management of postoperative pain with endodontic treatment. Only original research studies were included; editorials, reviews, brief notes, conference proceedings, and letters to the editor were excluded. The initial search yielded 4941 articles, which were assessed and filtered using the selection criteria. Sixty-five studies met the inclusion criteria and were included in the review. The findings showed that pain after nonsurgical root canal treatment occurred in 3–69.3% of patients. Microorganisms were identified as the primary contributors to postoperative pain, and there was no significant difference in postoperative pain between single- and multiple-visit treatments. Postoperative pain after root canal treatment ranges from mild to moderate and occurs even after optimally performed procedures. Furthermore, adequate management of postoperative pain is often considered an indicator of clinical excellence. Application of recently developed endodontic techniques and devices will reduce postoperative pain. Furthermore, a flexible, severity-based drug administration plan can be used to control and manage pain after root canal treatment. Application of the current research findings will reduce pain following root canal treatment and improve patient outcomes.

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Peer review under responsibility of Taibah University.



Production and hosting by Elsevier

Keywords: Analgesic; Endodontic; Nonsurgical; Postoperative pain; Root canal

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Introduction

Pain is a critical factor in dentistry because it is the primary cause of dental anxiety.¹ Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or a sensation described in terms of such damage.² Odontogenic pain is generated through complicated pathways; tissue damage results in action potential generation towards the central nervous system, which occurs in conjunction with inflammatory reactions at the affected site.³

It is a common belief that root canal treatment is the most painful type of dental treatment,⁴ and fear of postoperative pain affects many patients. Therefore, accurate knowledge regarding pain after root canal treatment and related factors will enable clinicians to predict and effectively manage postoperative pain.⁵ Furthermore, knowledge regarding the prevalence, severity, and management of postoperative pain after nonsurgical root canal treatment will reduce the occurrence of tooth removal and enable evidence-based guidelines for general practitioners to manage postoperative pain.⁴ Although root canal treatment alleviates long-term pain, postoperative pain immediately following root canal treatment is commonly reported.^{6–8} Therefore, effective prevention and management of such pain is essential to improve patient outcomes.

The present study aimed to determine the effects of nonsurgical root canal treatment on postoperative pain and to determine predictive and related factors. We also assessed the effects of recent advances in postoperative pain management using a systematic review approach. To achieve these aims, the following specific questions were addressed in relation to the effects of nonsurgical root canal treatment on postoperative pain in adult patients.

- 1) Does root canal treatment produce postoperative pain, and if so, what are the prevalences, severities, possible causes, and related factors?
- 2) Are there relationships between recent advances in endodontics and postoperative pain?
- 3) How can postoperative pain be prevented, reduced, and managed?

Materials and Methods

An electronic literature search was performed using the PubMed, ScienceDirect, and Cochrane databases to identify relevant peer-reviewed articles published between 1990 and 2016. Search keywords included “postoperative pain”, “nonsurgical treatment”, “single visit”, “recent advances in

endodontics”, and “management of postoperative pain of endodontic treatment.” We included original studies published in English. Editorials, reviews, brief notes, conference proceedings, and letters to editors were excluded (Table 1). The initial search identified 4941 articles, which were then assessed for eligibility and filtered using the selection criteria (Figure 1). Sixty-five studies met the inclusion criteria and were included in the present review.

Table 1: Article inclusion and exclusion criteria.

Inclusion	Exclusion
Article published in English	Systemic review
Study conducted using permanent teeth with fully formed apices	Case report or expert opinion
Clinical trial that randomly evaluated the influence of several factors on pain after root canal treatment	Study based on endodontic retreatment cases

Developed search keywords (postoperative pain, nonsurgical treatment, single visit, recent advances in endodontics, and management of postoperative pain of endodontic treatment)

Searched the PubMed, ScienceDirect, and Cochrane databases for articles published between 1990 and 2017

Identified publications (N = 4941)

Assessed articles for eligibility and filtered articles using the selection criteria (N = 65)

Figure 1: Article selection process.

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