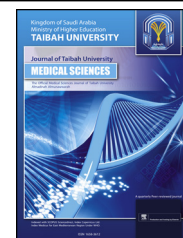




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Original Article

Technical quality assessment of root canal treatment performed by preclinical dental students at Taibah University, KSA

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المخلص

أهداف البحث: تهدف هذه الدراسة إلى تقييم الجودة التقنية لنتائج معالجة قناة الجذر التي قام بها طلاب طب الأسنان في المرحلة قبل السريرية في كلية طب الأسنان بجامعة طيبة بالمملكة العربية السعودية.

طرق البحث: تم في هذه الدراسة معالجة قناة جذور ٢٥٩ سناً مخلوفاً من قبل طلبة كلية طب الأسنان بجامعة طيبة، في المملكة العربية السعودية، في مرحلتهم الدراسية قبل السريرية من عام ٢٠١٣ إلى عام ٢٠١٥. كانت معايير التقييم؛ طول حشوة قناة الجذر، وكثافة حشوة قناة الجذر (التجانس)، وتذبذب حشوة قناة الجذر. وأعطى كل معيار درجة محددة (٠ أو ١ أو ٢).

النتائج: من بين ٢٥٩ سناً تم علاجها، كانت الجودة التقنية لعلاج الجذور لـ ٣٨ سناً (٥٣.٣٪) غير مرضية، والجودة التقنية لعلاج الجذور لـ ٤٢ سناً (١٦.٢٪) كانت مقبولة نوعاً ما، والجودة التقنية لعلاج الجذور لـ ٥٠ سناً (١٩.٣٪) كانت مقبولة، والجودة التقنية لعلاج الجذور لـ ٢٩ سناً (١١.٢٪) كانت مقبولة تماماً. لم تكن هناك فوارق ذات قيمة في الجودة التقنية لحشو جذر القناة بين أنواع الأسنان.

الاستنتاجات: أوضحت نتائج هذه الدراسة بأن الجودة التقنية لعلاج جذور الأسنان التي قام بها طلبة الأسنان في مرحلتهم الدراسية قبل السريرية تراوحت بين غير مقبولة، ومقبولة نوعاً ما، ومقبولة ومقبولة تماماً. شكلت فئة غير المقبولة الجودة أكبر نسبة من الحالات، وتمثل أكثر من نصف الحالات، بينما شكلت الحالات مقبولة الجودة تماماً أقل نسبة. هناك حاجة ملحة لتحسين برامج تدريس علم علاج جذور الأسنان في كلية الطب بجامعة طيبة. ينبغي إعادة هذا البحث مستقبلاً لتقييم تحسين الأداء في ما يتعلق بعلاج جذور الأسنان، الذي يقوم به طلبة كلية طب الأسنان في جامعة طيبة.

الكلمات المفتاحية: طلبة الأسنان؛ التعليم؛ علم علاج جذور الأسنان؛ المملكة العربية السعودية؛ النواحي التقنية

Abstract

Objectives: The aim of this study was to evaluate the technical quality of root canal treatment (RCT) performed by preclinical undergraduate dental students at the Dental College of Taibah University KSA.

Methods: In this study, 259 extracted teeth were treated endodontically by preclinical students of the College of Dentistry, Taibah University, KSA, from 2013 to 2015. The evaluation criteria were root canal obturation length, root canal obturation density (homogeneity), and root canal obturation taper. A specific score (0, 1, or 2) was assigned to each parameter.

Results: Of 259 endodontically extracted teeth, 138 (53.3%) had RCT of unacceptable technical quality, 42 (16.2%) had treatment of slightly acceptable technical quality, 50 (19.3%) had treatment of acceptable technical quality, and 29 (11.2%) teeth had RCT of perfectly acceptable technical quality. There were no significant differences ($p > 0.05$) in the technical quality of root canal obturation among types of teeth.

Conclusion: The results of this study showed that there were varied levels of technical quality of root canal treatment performed by preclinical undergraduate dental students, and the outcome varied between unacceptable, slightly acceptable, acceptable, and perfectly acceptable. The unacceptable cases were the most common, representing more than half of all cases, and the perfectly acceptable cases were the least common. There is an urgent need to improve the endodontics teaching programmes in the College of Dentistry of Taibah University. This research should be repeated in the future to evaluate improvement in the performance of RCT by undergraduate dental students in Taibah University.

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Keywords: Dental students; Education; Endodontics; KSA; Technical aspects

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Introduction

According to the Association for Dental Education in Europe, all dental students should be qualified to perform root canal treatment efficiently after graduation.¹ The teaching of endodontics is considered a major challenge for those academics responsible for this task more than any other subject in the undergraduate curriculum.² Recent years have seen a marked increase in the demand of patients for root canal treatment due to the increased age of the population, so dental students should possess the knowledge and skills in this discipline before the need increases even more.³ The assessment of dental student performance in endodontics will help to improve dental education.³ Therefore, undergraduate training should promote the comprehension of root canal treatment outcome and related factors.⁴

Contemporary endodontic curricula focus on optimizing the technical quality of root canal procedures. An association between root-canal-specific training as an undergraduate and improved quality of root canal obturation by dental graduates has been reported.^{5–8} Evaluation of root canal treatment quality has been shown to assist in planning future endodontic educational programmes.⁹ The quality of root canal filling is an important component of endodontic treatment.¹⁰ To improve clinical performance, knowledge, training, ability, and utilization of technology are necessary.^{11–13} Studies of the quality of root canal treatments (RCTs) and prevalence of endodontic procedural accidents can improve educational programmes, leading to improvement in the oral-health-related quality of life.¹⁴ Evaluation of the technical quality of root canal obturation is based on the limit and density of the obturation material.^{11,15,16} The length of root canal obturation from the radiographic apex and its density and taper have also been used to evaluate RCT.^{17,18} Canals with a 0- to 1-mm distance between the radiographic apex and the end of the obturation material were more successful than were canals in which the obturation material ended more than 1–3 mm from the radiographic apex. However, both are preferable to obturation materials that extrude through the apex.¹⁹ Although practical exercises by preclinical undergraduates improved the technical quality of RCTs performed by dental students at the clinical stage,²⁰ few studies of the performance of preclinical undergraduate students have been performed. Dental students at Taibah University take a preclinical annual endodontic course in the third year of their 6-year Bachelor of Dental Surgery degree. The course consists of a 1-credit theoretical hour and 2 practical credit hours per week for 28 weeks, during which they perform the technical aspects of

root canal treatment on extracted teeth. A recent study revealed the importance of improving RCT in Almadinah Almunawwarah by emphasizing the training of undergraduate students.²¹ The aim of this study was to evaluate the technical quality of RCT performed by preclinical undergraduate dental students in the Dental College at Taibah University, KSA.

Materials and Methods

This study was approved by the Research Ethics Committee of the College of Dentistry, Taibah University (reference number: TUCDREC/20160308/ALRAHABI).

In this study, we evaluated the technical aspects of root canal treatment of 259 extracted teeth performed by preclinical students of the College of Dentistry at Taibah University, KSA, during 2013–2015.

Tooth instrumentation

In this study, 259 extracted teeth were treated endodontically by preclinical students of the College of Dentistry at Taibah University, KSA, during 2013–2015. Sample distribution according to tooth type is shown in Table 1. All students underwent comprehensive training on the technical aspects of RCT of all types of teeth (one single canal tooth, one premolar, and one molar), and then the samples of the study were collected. The teeth had been prepared using stainless steel K-files (Dentsply Maillefer) with the step-back technique. All root canals were obturated using the lateral compaction technique using the 0.02 taper gutta-percha points (DENTSPLY DeTrey GmbH) and AH-26 sealer (DENTSPLY DeTrey GmbH).

Radiographic procedures

The radiographic procedure was performed using a dental X-ray unit (Gendex Expert DC KaVo, Germany) at 70 kVp, 10 mA, and 0.25 s exposure time and a digital sensor (Gendex GXS-700, USA). Buccolingual radiographs of extracted teeth were obtained using the paralleling technique. A 20° horizontal mesial angulation of the X-ray tube was used for the mandibular molars and upper premolars to prevent superimposition of root canals. The images were evaluated by two endodontists with more than 7 years of experience in endodontics. In case of disagreement, a third observer from the Department of Restorative Dental Science, College of Dentistry, Taibah University, was asked to make a final

Table 1: Sample distribution according to tooth type.

Tooth type and location	No. of teeth	Percent
Upper incisor	27	10.4
Lower incisor	44	17.0
Upper premolar	57	22.0
Lower premolar	45	17.4
Upper molar	41	15.8
Lower molar	45	17.4
Total	259	100

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