



## Outcome of nonsurgical endodontic treatment: A 5-year recall

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### Abstract

**Background:** Prognosis of nonsurgical endodontic treatment has been extensively studied over the last decades; however, the data obtained is insufficient. The purpose of this study was to retrospectively analyze the outcomes of initial endodontic treatment, and tooth retention over 5 years.

**Materials and Methods:** In this study, the treatment database of the King Khalid University Dental Clinics (KKUCD) is used to identify patient's undergone nonsurgical endodontic treatment in the year 2009. 779 patients were treated by students, interns, and specialists in KKUCD. 205 patients (217 teeth) were recalled and examined their teeth presence (retention), endodontic lesion healing status, and medical history status.

**Results:** Among the 217 teeth, 208 were retained and 9 were extracted in 5 years. The 217 teeth, 34 treated by specialists, 90 by interns, and 93 by students. The 9 extracted teeth were 3 treated by specialists, 1 by interns, and 5 by students. The 9 extracted teeth were 4 maxillary premolars, 2 maxillary molars, 2 mandibular premolars, and 1 mandibular anterior. Using Chi-square tests, survival endodontic cases which had uncertain to successful endodontic healing are 27 treated by specialists, 86 by interns, and 75 by students. There was a significant difference ( $P = 0.000$ ) in endodontic success and survivability between the normal medical status and insulin-dependent diabetes patients.

**Conclusions:** Within the limitations of this study, the survivability of nonsurgical endodontic treatment is very highly predictable 90%. Prosthodontics consideration is highly important since all extracted teeth in the study were not crowned. Nonsurgical endodontic treatment within insulin-dependent diabetes patients has fair to poor prognosis, which shows a less rate of success in comparison to other compromised patients.

### Introduction

The general objectives of endodontic treatment are to retain teeth in function and to prevent or heal apical periodontitis.<sup>[1]</sup> Multiple treatment options are available for the patients to restore esthetic and function and replace affected tooth. The patients frequently have to select among these treatment options by weighing the risks and benefits of each options.<sup>[2]</sup>

Many studies have approached endodontic outcome to estimate the prognosis of the selected treatment modality.<sup>[3-10]</sup> Unfortunately, data obtained regarding endodontic outcomes as well as the undesirable events such as extraction is considered insufficient.<sup>[1-5]</sup> Case selection and treatment planning may be

influenced by these data. Practitioners' treatment decision should be highly predictable for long-term prognosis.<sup>[6-11]</sup> That decision must be based on a high level of evidence.<sup>[11]</sup> Reports of outcomes of initial treatment were variable among the literature.<sup>[3-7]</sup>

The purpose of this study was to retrospectively analyze the outcomes of initial endodontic treatment, and tooth retention over 5 years.

### Materials and Methods

In this study, the treatment database of King Khalid University Dental Clinics (KKUCD) is used to identify patient's undergone

nonsurgical endodontic treatment in the year 2009. 779 patients were treated by students, interns, and specialists in KKUCD. 205 patients (217 teeth) were recalled and examined their teeth presence (retention), endodontic lesion healing status and medical history status.

**Materials**

A total of 779 patients (aged +18) treated in KKUCD 2009 done by students, interns, and specialist.

**Methods**

Call patients for a follow-up appointment, during their visit they are informed about our research, the patient visit steps:

1. Age and gender
2. Relevant medical history and vitality signs (pulse, pressure, respiratory, and temperature)
3. DH; history and any problems from his/her endodontically treated tooth in the past years. Record who did the root canal treatment (RCT) and restoration (students, interns or specialist)
4. Extra oral examination; temporomandibular joint, swelling, and lymph nodes check
5. Intraoral examination; general and teeth check (probing, mobility, palpation, and percussion) also crack, fracture leakage checking and type of coronal restoration
6. X-ray; 2 periapicals with different angles (check leakage, presence of post, type of post, and RCT status).

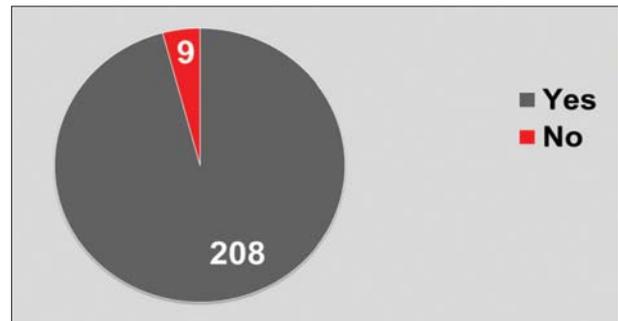
**Results**

Among the 217 teeth, 208 were retained and 9 were extracted in 5 years [Graph 1]. The 217 teeth, 34 treated by specialists, 90 by interns, and 93 by students. The 9 extracted teeth were 3 treated by specialists, 1 by interns, and 5 by students [Graph 2]. The 9 extracted teeth were 4 maxillary premolars, 2 maxillary molars, 2 mandibular premolars, and 1 mandibular anterior [Graph 3]. Using Chi-square tests, successful endodontic healing were 16 treated by specialists, 47 by interns, and 40 by students. Survival endodontic cases which had uncertain to successful endodontic healing are 27 treated by specialists, 86 by interns, and 75 by students [Graph 4]. There was a significant difference ( $P = 0.000$ ) in endodontic success and survivability between the normal medical status and insulin-dependent diabetes patients [Graph 5].

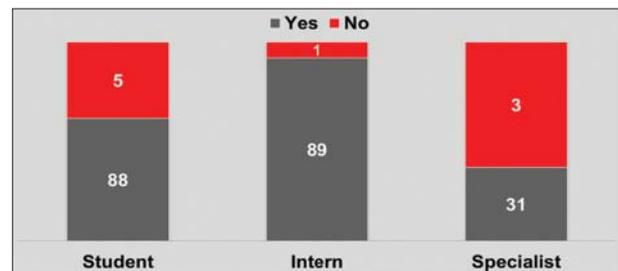
**Discussion**

The outcome of endodontic treatment was assessed by several studies (1, 2 + 3-7). The treatment outcomes were reported from 30% to 98%. This huge difference in the outcomes is mainly because of variable evaluation criteria.<sup>[1]</sup>

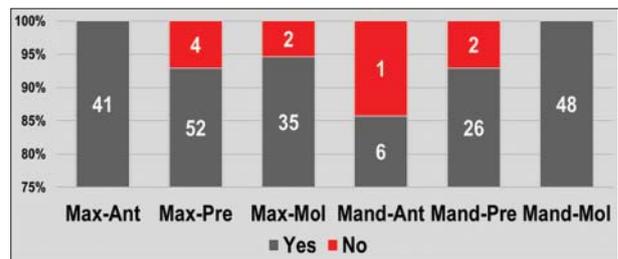
In this study, we analyzed the outcomes of initial endodontic treatment considering lesion healing and tooth retention as evidence of treatment success and survivability, respectively.



Graph 1: Teeth retention



Graph 2: Teeth retention among operators

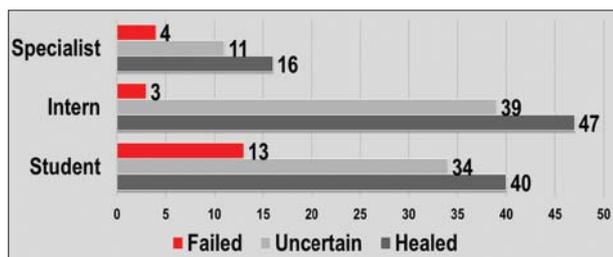


Graph 3: Teeth retention among teeth types

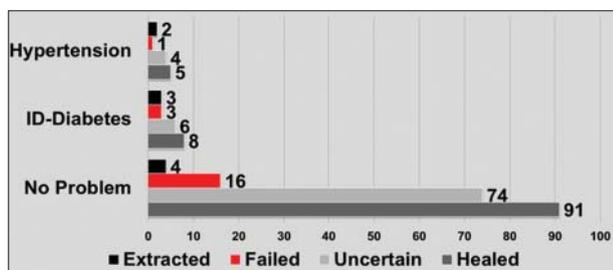
208 teeth retained in 5 years, healing rate (success) was 82% while the survivability (uncertain to healed lesions) was 90%. Our results matched with most of the endodontic outcomes studies (1 + 3-7). Endodontic clinical failures were seen within the first 3 years. This comes in accordance with Nobuhara and Del Rio study.<sup>[12]</sup>

All 9 teeth, which were extracted during the recall period, were not crowned. That may be the main failure factor lead to extraction. This fact repeated the finding of Fuss et al.<sup>[13]</sup> study, when they found the quality of the crown restoration is a major cause of failure (43.5%). The same was found in Vire<sup>[14]</sup>, when they reported 59% of the failed cases were because of prosthodontics reasons. Zadik et al.<sup>[15]</sup> found <1% of the failure is due to prosthetic reasons which contradict ours, Fuss et al.<sup>[13]</sup> and Vire.<sup>[14]</sup>

Among the 205 patients, there were 12 hypertensive patients. No significant difference in treatment outcome was observed when compared to normal patients. Our result was similar to Segura-Egea et al.<sup>[16]</sup> Among 20 insulin-dependent diabetes patients, we found a significant failure in diabetic



Graph 4: Healing status among operators



Graph 5: Teeth retention and healing status in relation to medical status

patients, which was in accordance to Fouad<sup>[17]</sup> study when they found that cases with pre-operative periradicular lesions are less likely to have successful outcome if the patient reports a history of diabetes.

**Conclusions**

Within the limitations of this study, the survivability of nonsurgical endodontic treatment is very highly predictable 90%. Prosthodontics consideration is highly important since all extracted teeth in the study were not crowned. Nonsurgical endodontic treatment within insulin-dependent diabetes patients has fair to poor prognosis, which shows a less rate of success in comparison to other compromised patients.

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