

Radiograph Endodontic Interpretation

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Abstract: Introduction: Knowledge of different possible alterations in the internal anatomy of teeth is important for successful endodontic therapy. Purpose: The intention of the study is to evaluate which radicular radiography features students want to interpret, which ones they miss in a diagnostic radiograph, and how accurately students are able to interpret radiographic features, correlate with general dentists. Materials and Methods: 20 students were selected of Faculty of Dentistry and given 2 sets of retroalveolar X-rays. The students had to analyze. The first set consist of 10 X-rays, asked them to elucidate anatomy-morphological: number of roots, and continuity of lamina dura. The second set consist of 30 retroalveolar X-rays, which we used for diagnostic analysis in terms of dental calcification and periapical changes. 20 general dentists were selected, and given also 2 sets of retroalveolar X-rays. The general dental practitioners had to analyze. The first set consists of 10 X-rays, asked them to elucidate anatomy-morphological: number of roots, and continuity of lamina dura. The second set consist of 30 retroalveolar X-rays, which we used for diagnostic analysis in terms of dental calcification and periapical changes. Using a paired t-test, there was significant variation in answers between the first set and second set of questionnaires. Results: In the first set, more than 50% of students interpret number of roots and continuity of lamina dura. In the second set, more than 90% missed grade dental calcification and more than 80% of students, missed periapical changes. In the first set, all 20 general dentists interpret number of roots and continuity of lamina dura. In the second set, more than 60% of general dentists missed grade dental calcification, and all general dentists interpret periapical changes. Conclusion: The conclusion from this study is that students are able to detect sound radicular endodontic anatomy-morphological features, but they miss the dental calcification and periapical changes. General dentists are able to detect sound radicular endodontic anatomy-morphological features and periapical changes, but they miss the dental calcification.

Keywords: radicular radiography, students, general dentists, diagnostic radiograph, dental calcification, periapical changes.

1. Introduction

Endodontics is the dental specialty concerned with the study and treatment of the dental pulp. Endodontists perform a variety of procedures including endodontic diagnostic and endodontic therapy. Endodontics is one of the few branches in dentistry in which both diagnosis and treatment depend largely upon radiographs [1]. Radiographic diagnosis might therefore influence endodontic treatment planning and the quality and the cost of dental health care [2]. Modern endodontic diagnosis relies heavily on radiographic examination and provides the most valuable information compared with other diagnostic tests [3].

2. Material and Methods

The study included two sets of questionnaires. In the first set of questionnaires, the 20 students were asked which radicular radiographic features they would interpret from a anatomy-morphological: number of roots, and continuity of lamina dura. The second set consist of 30 retroalveolar X-rays, which we used for diagnostic analysis in terms of dental calcification and periapical changes. 20 general dentists were selected, and given also 2 sets of retroalveolar X-rays. The general dental practitioners had to analyze. The first set consists of 10 X-rays, asked them to elucidate anatomy-morphological: number of roots, and continuity of lamina dura. The second set consist of 30 retroalveolar X-rays, which we used for diagnostic analysis in terms of dental calcification and periapical changes.

The radiographs were examined by the students and general dentists using a conventional X-ray view box and magnifying lens under normal room lighting to simulate the clinical situation. Using a paired t-test, there was significant

variation in answers between the first set and second set of questionnaires.

The first anatomy-morphological set:

1. Number of roots
2. Continuity of lamina dura

The second diagnostic set:

1. Dental calcification
2. Periapical changes

Retroalveolar X-rays were taken using paralleling cone technique and films were held using film holders. Films were developed using manual X-ray developer and fixer (Eastman Kodak Co.) by the time and temperature method.

The number of students and doctors that assessed various radiographic findings was statistically analysed using percentile analysis and descriptive analysis [4]. Paired t-test was used to analyse the variation between the features that the students and general dentists said they would interpret in a radiograph and the findings they actually interpreted in the radiographs given to them.

3. Results and Discussion

In the first set, more than 50% of students interpret number of roots and continuity of lamina dura (Table 1). In the second set, more than 90% missed grade dental calcification and more than 80% missed periapical changes (Table 2).

Table 1: Findings those students said they will interpret in a anatomy-morphological radiograph for roots and continuity of lamina dura

Students interpret	
No. of roots %	Lamina dura %
> 50 %	> 50 %

Table 2: Findings that students said they will interpret for diagnostic analysis of dental calcification and periapical changes

Students missed grade	
Dental calcification	Periapical changes
> 90 %	> 80 %

In the first set, all 20 general dentists interpret number of roots and continuity of lamina dura (Table 3). In the second set, more than 60% of general dentists missed grade dental

calcification, and all general dentists interpret periapical changes (Table 4).

Table 3: Findings those general dentists said they will interpret in a anatomy-morphological radiograph for roots and continuity of lamina dura.

General dentists interpret	
No. of roots %	Lamina dura %
100 %	100 %

Table 4: Findings that general dentist said they will interpret for diagnostic analysis of dental calcification and periapical changes

General dentists interpret	
Dental calcification	Periapical changes
>60 %	100 %



Figure 1: Number roots



Figure 2: Lamina dura



Figure 3: Dental calcification, pulp stones



Figure 4: Pulp stones and periapical changes

The results of the present study indicate that students and general dentists are more able to detect: number of roots, continuity of lamina dura, periapical changes and canal calcification (pulp stones), changes in radiographs when there were moderate to extensive in nature (Figure 1,2,3 and 4), but when these changes were to a milder degree they were more likely to be missed by a students and practitioner.

For any radiograph where there was disagreement in the findings, and the findings were finalized after a consensus following joint discussion.

A clinician must be trained to identify normal anatomical landmarks and their variations as well as variations owing to pathology in a radiograph. Radiograph images have all the elusive qualities of a shadow so normal anatomical structures in a radiograph must be known thoroughly before interpreting the abnormalities [5].

Although solutions have been suggested for improved reading of radiographs, there is very little consensus on different approaches [6,7]. Kuyk et al in his study showed that the radiographic appearance of the root canal correlated well with the histological diameter of the canal, and this study reiterates the importance of canal calcification

interpretation using the radiograph. He also advocates that radiographs showing completely calcified canals do have canals present histologically and radiographs showing visually present canals may be clinically difficult to trace [8].

Knowledge of different possible alterations in the internal anatomy of teeth is important for successful endodontic therapy [9,10,11].

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