

KODAK 9000 3D Extraoral Imaging System

Difficult Diagnosis: The value of CBCT's ability to see between the cortical plates.

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Case Overview

A 34-year-old caucasian female in good health presented with complaints of mild pain in the lower right quadrant. The chief complaint was occasional episodes of mild spontaneous pain as well as mild pain during mastication. The patient had a history of initial root canal therapy in an endodontic office 3 ½ years earlier and while she cannot identify the tooth causing the pain she states that it did start shortly after the root canal completion. Clinical exam and testing did not reveal any significant finding that would aid in a definitive diagnosis. Teeth # 28, 29, 30, 31 all tested slightly positive to percussion and slightly positive to biting pressure, with the patient not being able to identify one tooth as being any more sensitive than the others. There was no palpation sensitivity. All restorative work was in good condition, and all periodontal findings including probings were within normal limits.

Conventional periapical x-rays (Figure A) of the area showed no significant findings other than possibly a very small break in the PDL on the mesial apex of #30, and very slight widening of the apical PDL on #31. Due to the very marginal radiographic findings and the fact that all non-endodontically treated teeth had normal vitality results, the radiographs did not aid in obtaining a diagnosis.



Figure A: Pre-treatment periapical radiograph.



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Dr. Curtis J. Brimley has practiced endodontics in the Salt Lake Valley since 2006. Dr. Brimley completed his undergraduate work at Brigham Young University and attended Temple Dental School in Philadelphia, Pennsylvania. After graduation from Temple, Dr. Brimley completed a residency at the University of Utah Medical Center in clinical and trauma dentistry, and received his credentials in Endodontics in 2006 from Mercy Hospital in Detroit, Michigan. Dr. Brimley founded Copper Creek Endodontics to provide the highest level of endodontic care for his patients. He is committed to providing exceptional treatment results for every patient he works with.





A focused-field CBCT scan was obtained of the area with the following results. In all three views (sagittal, axial, and coronal) a periapical lesion is evident on the mesial apex of #30. There is also evidence of condensing osteitis surrounding the lesion suggestive of its long standing presence.



Figure B: Periapical lesion on sagittal view.



Figure C: Periapical lesion on axial view.



Figure D: Periapical lesion in coronal view.

Treatment Plan

Retreatment of the existing root canal was recommended.

Testimonial

The 1966 Seltzer and Bender study on the limitations of conventional dental radiology showed us that until an endodontic lesion involves the cortical plate it is not detectable on a periapical film radiograph. This limitation still complicates radiographic examinations today. CBCT provides not only the solution to this limitation but also the capacity to go far beyond it. Cone beam's ability to see between the cortical plates allows for the discovery of a tremendous amount of pathology that would otherwise be undetectable. Not only does this aid tremendously in diagnostic testing, it allows for problems to be detected and treated much earlier than before.