The KPG Index – A Novel 3D Classification System for Maxillary Canine Impactions

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Introduction

The specialty of orthodontics is filled with a variety of challenges that require careful diagnosis and planning; one of these challenges involves impacted maxillary canines. To enact a treatment plan after diagnosis, it is necessary to correctly determine the exact location of the impacted tooth. Historically, 2-D radiographs were used to localize these teeth, and the prediction of treatment time was based purely on the orthodontist’s experience. With the recent advancements of Cone Beam Computed Tomography (CBCT) imaging, a practitioner has access to an abundance of information regarding an impaction (2).

Abstract

Introduction: Advancements in Cone Beam Computed Tomography (CBCT) have improved localization of impacted canines. The KPG index is the first 3-D classification system for classifying the position of canines based on their distance from the norm (1). The aim of this study was to determine if this index provides an estimate of the time necessary to treat an impacted canine using closed eruption.

Materials and Methods: CBCT scans of 28 impacted canines at The University of Texas School of Dentistry at Houston Department of Orthodontics were classified using the KPG index. The scores and categories were compared to the time from surgical exposure to proper positioning.

Results: Four canines were classified as “Easy,” 11 as “Moderate,” 9 as “Difficult,” and 4 as “Extremely Difficult.” Average treatment times associated in months were: “Easy” — 11.23, “Moderate” — 11.36, “Difficult” — 12.76, and “Extremely Difficult” — 13.23.

Conclusions: The KPG index currently cannot be confirmed as an accurate means of estimating treatment time for an impacted canine. Further verification studies should include larger sample sizes and compare differing mechanics. However, there are limitations to 2-D imaging; therefore, the 3-D CBCT images and the KPG index, with further validation, will become increasingly valuable to orthodontists.

KEY WORDS: MESH terms: cuspid/radiography, image enhancement/methods, imaging, three-dimensional/methods, pattern recognition, automated/methods, radiographic image interpretation, computer-assisted/methods, radiography, dental/methods, reproducibility of results, tomography, X-ray computed/methods, tooth, impacted/radiography

Cone Beam Computed Tomography Imaging in the Evaluation of the Temporomandibular Joint

Abstract

A radiological examination is an essential part of the diagnosis and management of temporomandibular joint disease. Accurate evaluation of the TMJ has been difficult due to the superimposition of other structure in conventional radiographs. Cone beam computed tomography provides precise imaging of TMJ anatomy without superimposition and distortion. The CBCT’s preciseness enables practitioners to better identify problems, as well for other strategies. Common conditions of the TMJ in which CBCT plays a role are discussed.

KEY WORDS: Cone-Beam Computed Tomography/methods Temporomandibular Joint/radiography

Calibration of Equipment for Analysis of Drinking Water Fluoride: A Comparison Study

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Introduction

Fluoride has been credited to play a key role in preventing dental caries since the 1940s. Its well documented safety and efficacy in dental caries prevention have resulted in recommendations of its use for this purpose by the U.S. Public Health Service (1). One of the longest standing applications of fluoride use for caries prevention has been the fluoridation of community drinking water supplies. In recent years, the city of San Diego initiated fluoridation of its community water supplies (2,3), and the governor of Louisiana signed a bill providing for an increase in the number of communities receiving fluoridated water in that state (4). Optimal fluoride concentration in public drinking water for caries prevention has been determined to range from 0.7 to 1.2 ppm, depending on the average maximum daily

Abstract

Current American Dental Association evidence-based recommendations for prescription of dietary fluoride supplements are based in part on the fluoride concentration of a pediatric patient’s drinking water. With these recommendations in mind, this study compared the relative accuracy of fluoride concentration analysis when a common apparatus is calibrated with different combinations of standard values. Fluoride solutions in increments of 0.1 ppm, from a range of 0.1 to 1.0 ppm fluoride, as well as 2.0 and 4.0 ppm, were gravimetrically prepared and fluoride concentration measured in pentad, using a fluoride ion-specific electrode and millivolt meter. Fluoride concentrations of these solutions were recorded after calibration with the following 3 different combinations of standard fluoride solutions: 0.1 ppm and 0.5 ppm, 0.1 ppm and 1.0 ppm, 0.5 ppm and 1.0 ppm. Statistical analysis showed significant differences in the fluoride content of water samples obtained with different two-standard fluoride solutions. Among the two-standard fluoride solutions tested, using 0.5 ppm and 1.0 ppm as two-standard fluoride solutions provided the most accurate fluoride measurement of water samples containing fluoride in the range of 0.1 ppm to 4.0 ppm. This information should be valuable to dental clinics or laboratories in fluoride analysis of drinking water samples.

KEY WORDS: drinking water, fluoride analysis, fluoride supplements