



# Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology

## ORAL AND MAXILLOFACIAL RADIOLOGY

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**RADIOLOGIC DIAGNOSIS OF ENOSTOSIS IN THE MANDIBLE.** *M. Araki, K. Hashimoto, K. Matsumoto, K. Komiyama, T. Ishii, S. Nishimura, and Y. Akiyama, Departments of Radiology, Pathology, and Oral and Maxillofacial Surgery, Nihon University School of Dentistry, Tokyo.*

*Background.* Enostosis occurs from the inner surface of corral bone and grows into the cancellous bone. This lesion has not been understood in detail. Three-dimensional images by cone-beam CT for dental use can be useful to diagnose this lesion.

*Objective.* Although osteosclerosis, focal condensing osteomyelitis, and dysplastic lesions of the jaw bone occur near the root of tooth, their shape and aspect observed on rotational panoramic radiographs are often similar to enostosis. Therefore we attempted to differentiate these lesions from enostosis using radiographic features. Enostosis is usually not extracted; therefore the diagnosis of enostosis is actually done by cone-beam CT for dental use (3DX multi-image microCT; Morita, Kiyoto, Japan), which can precisely observe the relationship between the lesion and adjacent cortical bone.

*Study design.* Forty radiopaque lesions diagnosed as enostosis from their radiographic features by 3DX images were used in the study. The radiographic features of these 40 lesions were investigated using panoramic, periapical and occlusal radiographs. The appearance of 40 lesions was observed according to occurrence site, relationship with the roots of teeth by these radiographs, relationship with the mandibular canal, and the shape of lesions by 3DX images.

*Results.* Fifty percent of the cases of enostosis were located in the premolar region in the mandible and observed osteosclerosis-like images surrounding the mental foramen or mandibular canal on 3DX images. Twelve cases of enostosis arose from buccal cortical bone, 23 from lingual cortical bone, and 5 unclassified. On the rotational panoramic radiographs, 40% of the enostosis masses made contact with tooth roots, 40% were located in the body of the mandible, and the remainder were edentulous. The enostosis presented as an ovoid radiopaque lesion on the rotational panoramic radiographs, and their internal structure showed either uniform radiopacity or not. Lamina dura of adjacent teeth nearby the lesion showed clearly.

*Conclusions.* Neither rotational panoramic radiograph nor occlusal radiograph can exactly diagnose the location and state of the enostosis. 3DX images can diagnose this lesion in detail.

**STORAGE PHOSPHOR PLATES: FACTS AND ARTIFACTS.** *A. Athar, C. Angelopoulos, and J. O. Katz, University of Missouri—Kansas City School of Dentistry.*

*Background.* Although the diagnostic efficacy of storage phosphor plates (SPPs) as a digital imaging system has been

evaluated to some extent, the durability of such system has not been addressed yet.

Our experience indicates that the durability of this imaging system may be limited, despite the manufacturer's claim that SPPs can be used indefinitely. Since one of the reasons for this may be inexperienced users (dental students) in a dental school setting, we thought that a comparison between private practices using SPPs and the dental school might be valuable.

*Objective.* The aim of this in vitro investigation was to evaluate the durability of storage phosphor plates as a digital dental imaging system in a teaching environment as well as in a private practice setting.

*Study design.* 3 groups of 30 new storage phosphor plates (90 plates total) were used in this study. Each group was assigned to a different practice environment: 2 private practices and a dental school. The SPPs in each group joined the existing ones at the practices and dental school. Prior to the experiment the dental staff of the 2 private practices were given verbal and written instructions for the proper handling of the SPPs.

Every 15 days all the 90 plates were collected and exposed under standardized conditions in order to be evaluated for any physical and radiographic signs of wear (scratches).

*Results.* The SPPs used in a private practice setting showed signs of wear (scratches) as often and as soon as the ones used at the dental school.

*Conclusions.* This study indicates that durability is a concern when SPPs are used as a digital dental imaging system in both private practice and dental school settings.

**PILOT STUDY OF ANATOMIC STRUCTURES FOR AUTOMATIC IMAGE RECOGNITION OF PANORAMIC RADIOGRAPHS.** *D. K. Benn, Department of Oral Surgery, School of Dentistry, University of Florida, Gainesville.*

*Background.* In 2002 US national health care expenditures rose by 9.3% to consume 14.9% of GDP. By 2013 expenditure is projected to reach 18.4% of GDP.<sup>1</sup> Increasing efficiency of health care spending in terms of improving access to care and quality of services is of great urgency to control expenditure. In radiography, some aspects of image analysis might be performed automatically, possibly reducing the costs of care. Specifically, quality of images could be assessed as well as screening for diseases performed.

A method for automatically recognizing anatomical structures in bitewing radiographs was reported in 1991.<sup>2</sup> An automated method for assessing some aspects of intraoral radiographic quality was reported in 1994.<sup>3</sup> However, no automated method for recognizing anatomic structures in a hierarchical model from panoramic radiographs has been reported. Such a method could be used for film quality and disease screening.