

Imaging of Benign Odontogenic Lesions



William C. Scarfe, BDS, FRACDS, MS, Shiva Toghyani, DDS, MS*, Bruno Azevedo, DDS, MS

KEYWORDS

- Benign odontogenic cysts • Benign odontogenic tumors • Panoramic radiography • Cone beam CT
- Multidetector CT • MR imaging

KEY POINTS

- Odontogenic cysts and tumors of the jaws originate from remnants of the tooth-forming organ within the alveolus of the maxilla and mandible.
- Odontogenic cysts arise from the epithelium whereas tumors can arise from odontogenic epithelium, ectomesenchyme, or a combination of these tissues.
- Image interpretation requires a description of radiographic presentation according to location in relation to the dentition, radiologic pattern, and identification of disease-specific imaging features.
- Dental panoramic or maxillofacial cone beam CT provides sufficient imaging for most benign odontogenic lesions. Multidetector CT, with or without contrast, and MR imaging is only indicated if there is suspicion of extraosseous soft tissue extension or malignancy.
- A radiologic differential diagnosis is developed based on an understanding of the relative incidence, demographic presentation, and specific imaging features of benign odontogenic lesions.

INTRODUCTION

Most lesions within the jaws are inflammatory in origin, related to the ultimate sequelae of pulpal necrosis of the tooth (see Shaza Mardini and Anita Gohel's article, "Imaging of Odontogenic Infections," in this issue). Other benign lesions may arise from the remnants of the histologic embryonic structures associated with odontogenesis within the tooth-bearing areas of the jaws (dental alveolus). These structures include (1) ectodermal or epithelial cells, giving rise to ameloblasts forming the peripheral components of the crown, and (2) ectomesenchymal cells, giving rise to the odontoblasts, producing dentine and cementum, and the dental papilla, giving rise to the tooth-supporting apparatus (periodontium). Two types of benign entities can arise from these tissues: odontogenic cysts (of either developmental or inflammatory origin) and odontogenic tumors.¹

Odontogenic cysts are epithelial lined cavities whose lumen can consist of air, fluid, or semifluid material. Cysts are derived from odontogenic epithelium or entrapped remnants within the bone or peripheral gingival tissue. The pathologic classification of odontogenic cysts is based on the origin of the epithelial lining.^{1,2} Odontogenic tumors may also be ectodermal in origin or, in addition, may arise from mesenchymal (dental papilla or dental sac) tissue or simultaneously from both tissues. Some odontogenic tumors produce dental calcifications and, therefore, present as mixed high/low-attenuation entities.³

ORAL AND MAXILLOFACIAL IMAGING OF BENIGN LESIONS

Although CT and MR imaging are common in medical practices and hospitals, in-office cone beam CT (CBCT) units offer fast volumetric

Radiology and Imaging Sciences, Department of Surgical & Hospital Dentistry, University of Louisville, 501 South Preston Street, Louisville, KY 40202, USA

* Corresponding author.

E-mail address: s0togh01@louisville.edu

Radiol Clin N Am 56 (2018) 45–62

<http://dx.doi.org/10.1016/j.rcl.2017.08.004>

0033-8389/18/© 2017 Elsevier Inc. All rights reserved.

acquisition with a smaller office footprint, reduced per-scan cost, higher resolution, and significant dose savings compared with multidetector CT (MDCT). Another advantage is that the viewing software provides dental image formatting capabilities with particular application to the visualization of benign odontogenic lesions.⁴ MDCT units also have dental software modules (eg, DentaScan [GE Healthcare, Chicago, Illinois]); however, these are usually purchased at additional cost.⁵

Postprocessing Protocols

All dental software programs allow for the creation of a simulated reformatted dental panoramic image (Fig. 1). Reformatted panoramic and cross-sectional images allow visualization of pathology in relation to the teeth and important anatomic structures, such as the inferior alveolar canal (IAC), also referred to as the mandibular canal,

and the maxillary sinuses. The position of the IAC can be traced through the mandible on the panoramic and transaxial views using software (see Figs. 1D and E). This feature is valuable when the IAC is obscured or displaced by pathology.^{4,6}

IMAGING FEATURES OF ODONTOGENIC CYSTS AND BENIGN TUMORS OF THE JAWS

An important feature differentiating odontogenic from nonodontogenic entities is their location within the jaws. Odontogenic lesions of the jaw bones arise from the remnants of odontogenic apparatus and, therefore, are associated with the teeth or have an epicenter within the dental alveolus and, in the mandible, are usually superior to the IAC. Lesions location can be described according to position relative to the tooth and include periapical, pericoronal (for unerupted teeth), and inter-radicular. Nonodontogenic lesions involve

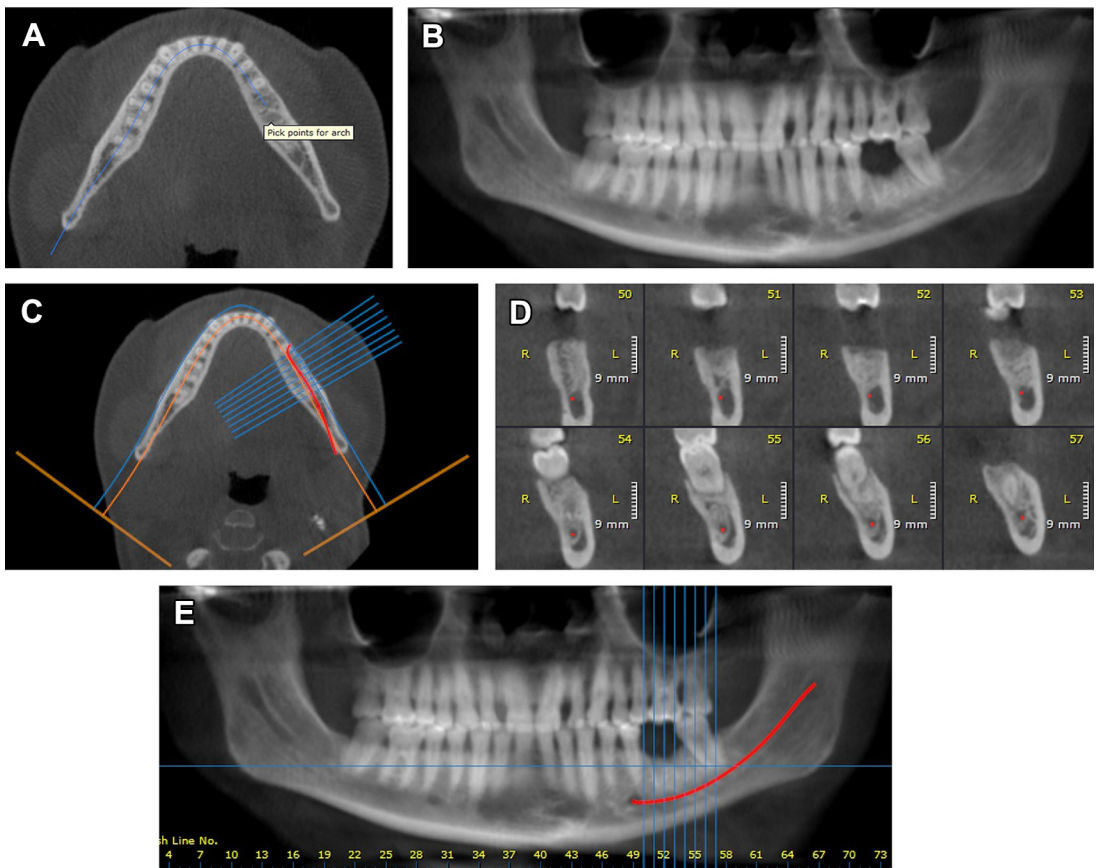


Fig. 1. A reformatted dental panoramic image is created by selecting multiple nodes along the curve of the alveolar process in an axial image (A). The nodes are connected by a curved transaxial plane or spline. Spline thickness may be adjusted from 15 mm to 20 mm to create a ray sum simulated panoramic image (B). Transaxial images are generated perpendicular to the spline (C) producing sequential cross-sectional images (D) related to the panoramic image by a reference numbering system (E). The location of the IAC can be traced on the panoramic and transaxial views using software (D, E).

Download English Version:

<https://daneshyari.com/en/article/8824923>

Download Persian Version:

<https://daneshyari.com/article/8824923>

[Daneshyari.com](https://daneshyari.com)