# Diagnostic Imaging in Veterinary Dental Practice

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Figure 1—Photograph of a region of dried purulent debris around a cutaneous sinus tract located on the caudoventral aspect of the right mandible in a 5-year-old castrated male Maltese.

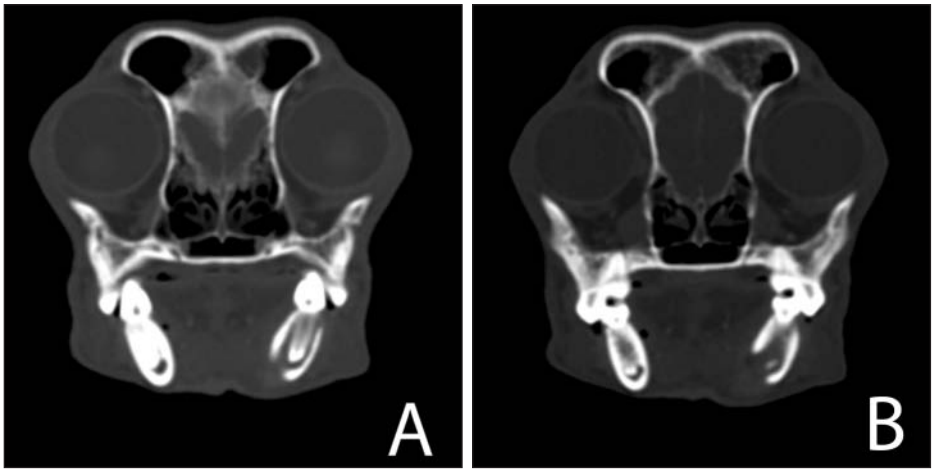


Figure 2—Transverse computed tomographic (CT) images obtained at the level of the mesial (A) and distal (B) roots of the mandibular first molar teeth of the dog in Figure 1.

## History and Physical Examination Findings

A 5-year-old 7.9-kg (17.4-lb) castrated male Maltese was evaluated because of a cutaneous sinus tract ventral to the caudal aspect of the right mandible. The dog had been treated with antimicrobials intermittently during the previous 6 months, but the lesion would only temporarily resolve. Because the lesion continued to recur, the referring veterinarian elected to explore the sinus tract surgically in an effort to identify the underlying cause. In the caudal aspect of the right mandible, the veterinarian found 2 circular bony defects. The veterinarian then referred the patient to the University of Illinois Veterinary Teaching Hospital for diagnosis and treatment.

Physical examination revealed dried purulent debris associated with a soft tissue swelling on the caudoventral aspect of the right mandible (**Figure 1**). Removal of the dried purulent debris revealed a cutaneous sinus tract. Results of a CBC and serum biochemical analyses were unremarkable, other than identification of rare reactive lymphocytes. The dog was anesthetized and positioned in sternal recumbency, and computed tomography was performed. Transverse, 1.25-mm-thick images of the head and neck were obtained before and after administration of contrast material with window width and level adjusted manually to optimize imaging of bone detail (120 kV, 100 mA, and 0.8 second rotation; **Figure 2**).

**Determine whether additional studies are required, or make your diagnosis, then turn the page →**

This report was submitted by Mary E. Buelow, DVM; Meghan Sullivan, DVM; Jodi Matheson, DVM, DACVR; and Sandra Manfra Marretta, DVM, DACVS, DAVDC; from the Department of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois, Urbana, IL 61802. Address correspondence to Dr. Buelow (marybuelow@hotmail.com).

## Diagnostic Imaging Findings and Interpretations

On the computed tomographic images, cortical bony lysis could be seen at the level of the mesial and distal root apices of the first molar tooth on the ventrolingual aspect of the caudal portion of the right mandible (**Figure 3**). There was also a region of heterogenous contrast enhancement of soft tissue structures ventrolingual to the caudal aspect of the right mandible in the region of the right mandibular molar teeth. Examination of a 3-D reconstruction model revealed circumferential bone loss on the ventrolingual aspect of the caudal portion of the right mandibular body around the mesial and distal root apices of the first molar tooth (**Figure 4**).

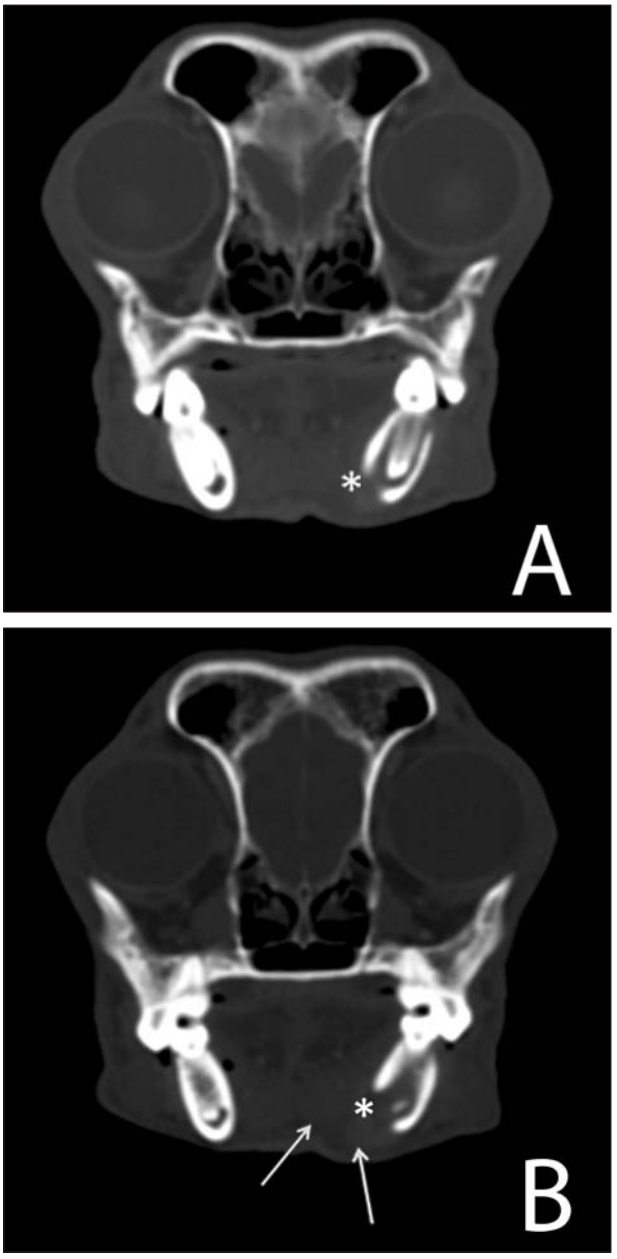


Figure 3—Same transverse CT images as in Figure 2. In the image obtained at the level of the mesial roots of the mandibular first molar teeth (A), there is evidence of bony lysis extending through the ventrolingual margin of the right mandible (asterisk). In the image obtained at the level of the distal roots of the mandibular first molar teeth (B), there is an additional region of bony lysis extending through the ventrolingual margin of the right mandible (asterisk). On this image, there is also a region of heterogenous contrast enhancement of soft tissue structures ventrolingual to the caudal portion of the right mandible (white arrows).

Once results of computed tomography were obtained, a complete oral examination and dental radiography were performed. A parulis (ie, an elevated nodule at the site of a draining tract of endodontic origin) was noted at the mucogingival junction on the buccal aspect of the right mandibular first molar tooth (**Figure 5**). Exploration of this tooth revealed an intact crown with mild abrasion and no evidence of pulp exposure, caries, fracture, or discoloration. Probing revealed no periodontal pockets. On an intraoral dental radiographic view of this region, large, ovoid, well-circumscribed, periapical lucencies were seen surrounding the mesial and distal roots of the right mandibular first molar tooth (**Figure 6**). The pulp cavity was wide in this tooth, compared with the width of the pulp cavities in adjacent teeth. A loss of integrity of the ventral mandibular margin underlying the first molar tooth

Figure 4—A 3-D reconstruction of the CT scan of the patient in Figure 1. Circumferential bone loss is evident on the ventrolingual aspect of the caudal portion of the right mandibular body around the mesial and distal root apices of the first molar tooth.

Figure 5—Photograph of the right mandibular first molar tooth in the dog in Figure 1. Notice the mild wear on the mesial aspect of the crown of the tooth and the parulis at the mucogingival junction (black arrow).

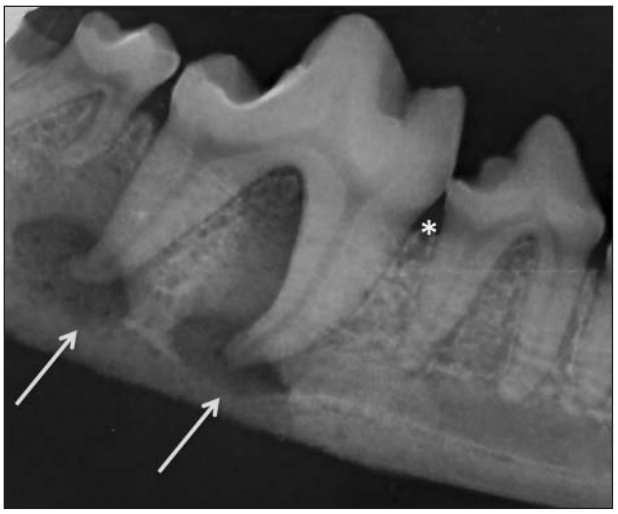

Figure 6—Intraoral radiographic view of the right mandibular first molar tooth in the dog in Figure 1. Notice the large, ovoid, well-circumscribed, periapical lucencies surrounding the mesial and distal roots of the right mandibular first molar tooth (white arrows). The pulp cavity in this tooth is wide, compared with width of the pulp cavities in adjacent teeth. A loss of integrity of the ventral mandibular margin underlying the first molar tooth is apparent, with a generalized moth-eaten appearance to the alveolar bone in the region of the first molar tooth that extends to the furcation of the second molar tooth. The alveolar bone also has a generalized loss of radiopacity along the distal aspects of the mesial and distal roots with loss of the lamina dura and periodontal ligament space in these regions. External inflammatory root resorption is seen at the cementoenamel junction of the mesial aspect of the mesial root (asterisk).

was noted, along with a generalized moth-eaten appearance to the alveolar bone in the region of the first molar tooth that extended to the furcation of the second molar tooth. The alveolar bone also had a generalized loss of radiopacity along the distal aspects of the mesial and distal roots with loss of the lamina dura and periodontal ligament space in these regions. External inflammatory root resorption was noted at the cementoenamel junction of the mesial aspect of the mesial root. The mesial cusp of the crown showed evidence of mild abrasion. A diagnosis of chronic endodontic disease of the right mandibular first molar tooth was made.

## Treatment and Outcome

The referring veterinarian extracted the right mandibular first molar tooth. Two weeks later, a recheck evaluation revealed that the draining tract was no longer present and the extraction site had healed without any complications.

## Comments

Cutaneous sinus tracts located in the region of the mandible or maxilla can be a diagnostic challenge for practitioners who are not familiar with dental disease.[1] Identification of such tracts should prompt veterinarians to perform a thorough oral and dental examination, including examination of the gingiva and oral mucosa; periodontal probing; use of a dental explorer to identify tooth resorption, caries, and pulp exposure; and dental radiography.[1–5] In the dog described in the present report, this diagnostic testing was not performed in the normal order, in that surgical exploration and computed tomography were performed prior to a complete oral examination and dental radiography. The rational systematic approach to the diagnosis of a maxillary or mandibular sinus tract should consist of oral examination and full-mouth dental radiography first, followed by more advanced diagnostic testing, if necessary.

In the oral cavity, the opening of a draining tract, or parulis, is often located along the mucogingival junction of the diseased tooth.[5] Obtaining dental radiographs with gutta-percha or another radiopaque marker gently inserted into the parulis can help to localize the source of the tract. Once the source of infection has been eliminated, spontaneous closure of the sinus tract typically occurs within 5 to 14 days.[1]

The most common cause of endodontic disease in dogs is tooth fracture with pulp exposure.[2,6] Other causes of endodontic disease include trauma without pulp exposure that results in irreversible pulpitis, dental attrition or abrasion, severe periodontal disease, dental caries, and tooth resorption.[2,3,6] In the dog described in the present report, the tooth appeared grossly normal except for mild abrasion, and clinical signs were limited to cutaneous and mucosal sinus tracts.

Systemic antimicrobial administration is often used as a first-line treatment for sinus tracts. This often results in a reduction in the amount of drainage and apparent healing of the sinus tract. However, cutaneous and mucosal tracts associated with dental disease require surgical treatment of the affected tooth. Treatment options include endodontic or periodontal treatment or tooth extraction.[1]

The case described in the present report demonstrates the importance of timely use of dental radiography for the diagnosis and treatment of sinus tracts in the mandibular and maxillary regions. The benefits of dental radiography, compared with computed tomography, include less cost, wider availability, lower dose of radiation used, and shorter anesthetic time. Because dental radiography is often adequate for diagnosis and treatment planning in animals with mucosal and cutaneous sinus tracts in the region of the maxilla and mandible, use of computed tomography should be reserved for more complex cases.

## References


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