

Figure 1—Intraoral occlusal (A) and lateral (B) bisecting-angle views of the left mandibular canine tooth and rostral aspect of the left mandible, with a parallel view of the caudal aspect of the left mandible (C) in a 10-year-old Pomeranian evaluated for routine periodontal treatment.

History and Physical Examination Findings

A 10-year-old 6-kg (13.2-lb) neutered male Pomeranian was evaluated for routine periodontal treatment. The owner mentioned that the patient had previously received dental care at another clinic, and extractions had been performed. A thorough oral examination could not be performed in the awake patient because of its temperament. No signs of oral pain were detected. Remaining results of the physical examination were considered normal. Serum biochemical analysis results and PCV were within the respective reference ranges.

The patient was anesthetized, a comprehensive oral examination was completed, and intraoral dental radiography was performed with bisecting angle and parallel techniques. The following teeth were identified as missing on oral examination: the left maxillary second premolar tooth, left mandibular first and second premolar teeth, left mandibular first molar tooth, and left mandibular third molar tooth. There was gingival enlargement, with a tooth fragment extruding from the gingiva, in the area where the left mandibular first molar tooth was missing. Selected radiographic views are provided (**Figure 1**).

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

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Diagnostic Imaging Findings and Interpretation

Radiographs revealed a pericoronal lucency enveloping the crown of the unerupted left mandibular first premolar tooth (**Figure 2**). This tooth was considered impacted, rather than embedded, because its horizontal malpositioning created a physical barrier to its path of eruption.¹ The root of the left mandibular first premolar tooth was undergoing external replacement root resorption. These radiographic findings, in the absence of other radiographic abnormalities, were pathognomonic for a dentigerous cyst. The pericoronal lucency was superimposed over a portion of the left mandibular canine tooth root; however, the periodontal ligament space of the canine tooth appeared to be intact and of uniform width.

The radiographic images also revealed a retained mesial root of the left mandibular first molar tooth (**Figure 2**). The root remnant had an ill-defined periapical lucency suggestive of chronic periapical periodontitis, and the width of the pulp cavity

was noticeably wider in appearance than those of the adjacent teeth. As a tooth ages, the root canal becomes narrower as a result of secondary dentin deposition, which is an active cellular process. The wider pulp cavity of this retained root indicated a cessation of odontoblastic activity consistent with a nonvital tooth.²

Treatment and Outcome

The diagnoses were discussed with the owner, and the decision was made to extract the impacted left mandibular first premolar tooth, remove the associated cystic cavity lining, and extract the retained mesial root of the left mandibular first molar tooth. The patient was anesthetized, the cystic cavity lining was removed by curettage, and the extractions were performed. Complete removal of the affected tooth and tooth roots was verified by radiographic examination. Bioactive glass^a was placed in the bone defect, and the extraction sites were sutured. The cystic lining and impacted tooth were submitted for histologic evaluation. The patient recovered uneventfully from

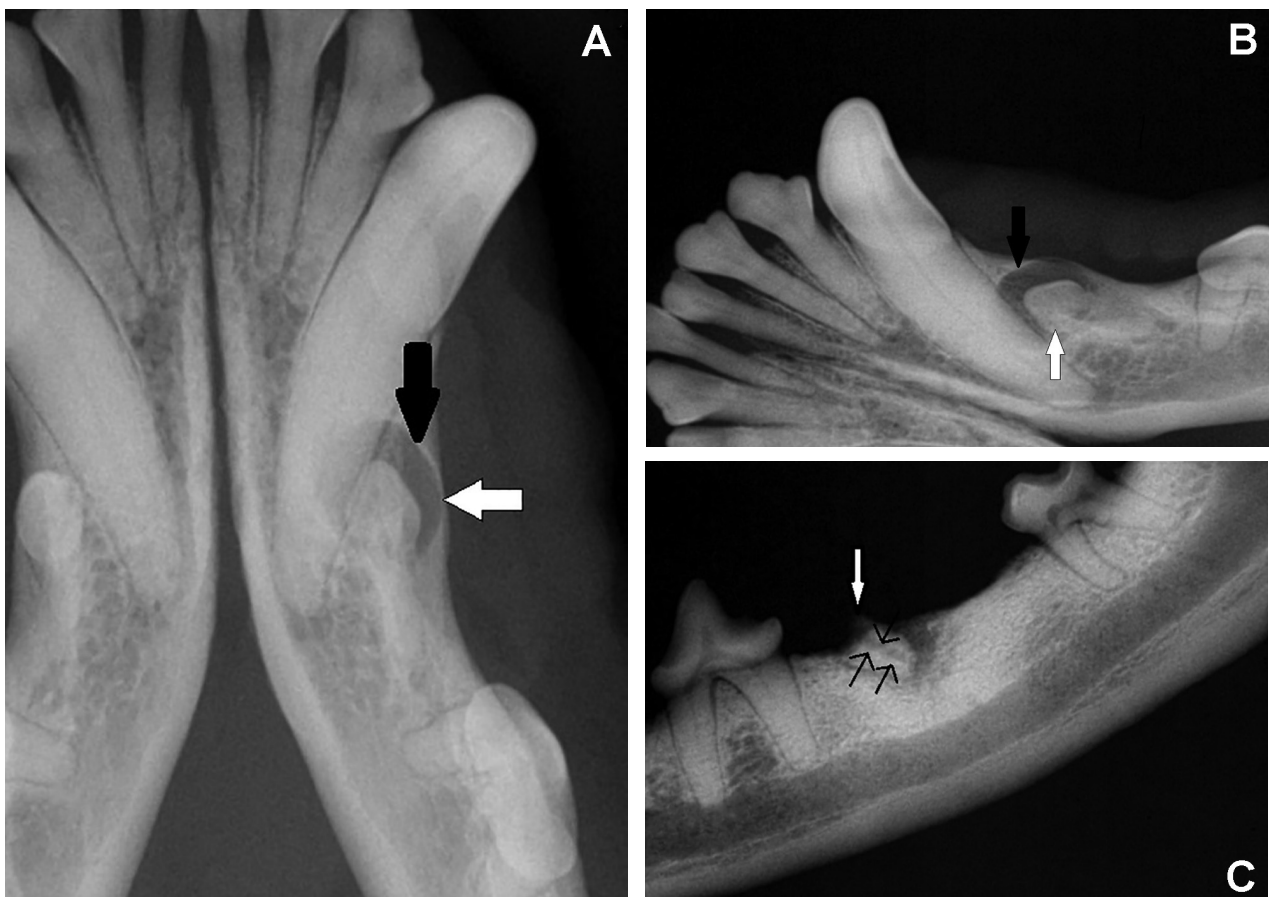


Figure 2—Same radiographic views as in Figure 1. A and B—The left mandibular first premolar tooth, apparently missing on gross oral examination, is impacted (white arrow), and root resorption is evident. The pericoronal lucency (black arrow) is superimposed over a portion of the left mandibular canine tooth root; however, the periodontal ligament space of the canine tooth appears intact and of uniform width. C—A retained mesial root of the left mandibular first molar tooth is present (white arrow). The pulp cavity of the retained tooth root appears much wider (black arrows) than those of the roots of adjacent teeth, and external inflammatory root resorption is present.

anesthesia and was discharged from the hospital the same day.

On histologic examination, the cystic lining was characterized as nonkeratinizing stratified squamous epithelium ranging from 2 to 4 cells thick. Fibrous connective tissue bordered the epithelium and contained a minimal amount of lymphocytes. The histopathologic findings were consistent with a dentigerous cyst.³

At a 2-week recheck appointment, visual assessment revealed that the extraction sites appeared to be healing well. The owner reported no problems with the patient at home. Dental radiographs obtained 60 days after the procedure revealed no recurrence of the cystic lesion.

Comments

Dentigerous cysts are the most commonly occurring odontogenic cysts. Odontogenic cysts form from tissues involved with tooth development.⁴ In a study¹ that examined cystic lesions in dogs, 20 of 28 (71%) cystic lesions were histologically consistent with dentigerous cysts. The mandibular first premolar tooth is the tooth most frequently associated with dentigerous cysts.³

This case illustrates the importance of dental radiography for detection of incidental findings that are clinically relevant. In a study⁵ that focused on dental radiography, incidental findings were identified in 78 of 187 (41.7%) dogs. Examination of intraoral radiographs for the dog of the present report revealed 2 abnormalities for which no clinical signs were observed: a dentigerous cyst and a retained tooth root. A dentigerous cyst can lead to substantial

bone loss, which can result in iatrogenic jaw fractures and damage to otherwise healthy teeth and adjacent anatomic structures (neurovascular bundles). A retained tooth root can cause considerable discomfort and result in local and systemic complications.⁶ Examination of dental radiographs at the time of previous dental treatments could have prevented progressive bone loss and identified the retained root tip. Pet owners may decline dental radiographs because of monetary concerns or because of a perception that they are unnecessary. This case exemplifies how dental radiography can identify conditions that, if left untreated, could potentially lead to substantial health problems and more expensive and invasive procedures.

Footnotes

- a. Consil, Nutramax Laboratories Inc, Lancaster, SC.

References

1. Babbitt SG, Krakowski Volker M, Luskin IR. Incidence of radiographic cystic lesions associated with unerupted teeth in dogs. *J Vet Dent* 2016;33:226-233.
2. DuPont GA, DeBowes LJ. Part two: radiographic anatomy. In: *Atlas of dental radiography in dogs & cats*. St Louis: Saunders, 2009;16.
3. Verstraete FJM, Zin BP, Kass PH, et al. Clinical signs and histologic findings in dogs with odontogenic cysts: 41 cases (1995-2010). *J Am Vet Med Assoc* 2011;239:1470-1476.
4. Honzelka SR, Kressin DJ, Chamberlain MS. Modified conservative treatment of an extensive dentigerous cyst in a dog. *J Vet Dent* 2014;31:249-254.
5. Verstraete FJM, Kass PH, Terpak CH. Diagnostic value of full-mouth radiography in dogs. *Am J Vet Res* 1998;59:686-691.
6. Reiter AM, Brady CA, Harvey CE. Local and systemic complications in a cat after poorly performed dental extractions. *J Vet Dent* 2004;21:215-221.