

JAVMA-05-06-0294-IVDP-0tab-2fig(3parts)-KMC-KJM

Diagnostic Imaging in Veterinary Dental Practice

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AMERICAN VETERINARY DENTAL COLLEGE

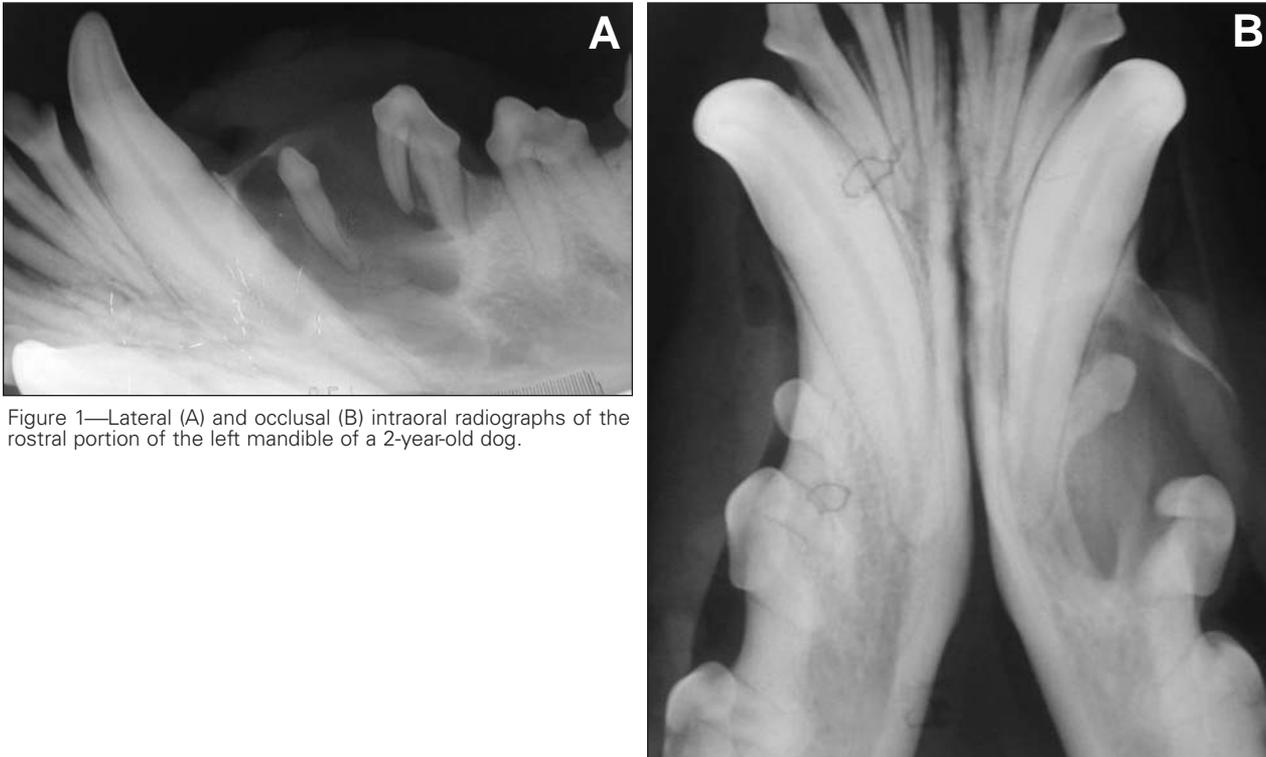


Figure 1—Lateral (A) and occlusal (B) intraoral radiographs of the rostral portion of the left mandible of a 2-year-old dog.

History and Physical Examination Findings

A 2-year-old 32-kg (70.5 lb) spayed female mixed-breed dog was referred to the Animal Hospital of Verona for evaluation of a cystic lesion of the oral cavity. Previous examination had not yielded a definitive diagnosis.

Oral examination revealed a purple to pink swelling approximately 15 × 20 × 11 mm involving the dorsal aspect of the left mandible in the location where the first premolar would normally be located. The lesion appeared cystic but contained a firm shelf on its dorsobuccal aspect that was suspected to be bone. The mandibular left first premolar was absent, and the mandibular left second premolar was more mobile than normal. Lateral and occlusal intraoral radiographs of the cystic lesion and surrounding tissues were obtained (Figure 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page ▶

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Diagnostic Imaging Findings and Interpretation

On the lateral radiographic image, the presumably absent first premolar can be seen (Figure 2). The periodontal ligament space is visible, but the lamina dura is not obvious. There is a well-demarcated radiolucent area, with the crown of the first premolar as the epicenter. A well-corticated area of less radiodense bone extends from the distal aspect of the canine tooth to the distal aspect of the second premolar and from the ventral aspect of the radiolucent area to the periapical region of the canine tooth. The caudal-to-caudoventral margin of the lesion appears to be sclerotic, as apposed to corticated, which was considered a possible sign of infection of the cyst.¹ The second premolar appears to be coronally displaced and tipped distally; there is no evidence of external root resorption, and the bone surrounding the roots is less radiodense than the bone surrounding the roots of the third premolar. There is a periapical lucency of the mesial root of the second premolar, suggesting possible endodontic involvement. The lamina dura and periodontal ligament space of the middle third of the root of the canine tooth are absent.

On the occlusal view, there is no periapical lucency of the canine tooth and the pulp cavity widths are similar to pulp cavity widths of the opposite canine tooth, suggesting the canine tooth is vital. The ventral mandibular cortex is unaffected, and periosteal reaction is not apparent.

A differential diagnosis of an unerupted tooth resulting in a dentigerous cyst of the mandibular left first premolar causing resorption of the alveolar bone of the second premolar and partial resorption of the alveolar bone of the canine tooth was made.

Treatment and Outcome

A diverging vertical releasing incision was made distal to the mandibular left second premolar, and a horizontal interdental releasing incision was made starting from the mesial aspect of the mandibular left second premolar and extending rostrally. The gingiva was then elevated, releasing copious clear brown fluid. A cystic defect in the mandible containing the unerupted first premolar and the mesial root of the second premolar could be seen. The first and second premolars were extracted, and the cystic lining was removed by curet-

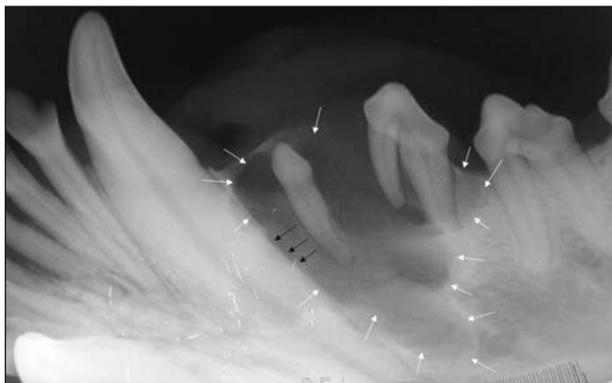


Figure 2—Same radiographic view as Figure 1A. The first premolar can be seen in the center of a well-demarcated radiolucent area (white arrows). The lamina dura and periodontal ligament space of the middle third of the root of the canine tooth is absent (black arrows). Notice the periapical lucency of the mesial root of the second premolar.

tage. The first premolar and portions of the lining were submitted for histologic examination. Synthetic bone graft particulate was placed over the exposed section of the root of the canine tooth, and the soft tissues were apposed with absorbable sutures. On histologic examination, the cystic lining was found to consist of mature stratified squamous epithelium embedded in a fibrous matrix and surrounded by mild to moderate inflammation; the lining ranged from 4 to 7 cell layers in thickness. The submitted tooth appeared normal microscopically.

A follow-up examination was performed approximately 10 months after surgery. Results of an oral examination were unremarkable except for the absence of the mandibular left first and second premolars. On a lateral radiographic view of the mandible, the cystic lesion had filled in with normal-appearing bony tissue. The periodontal ligament space of the canine tooth was visible, although it was thinner in the middle third of the root. On the occlusal view, the pulp cavities of the mandibular canines were symmetrical, suggesting that the mandibular left canine was vital.

Comments

In the dog described in the present report, a diagnosis of dentigerous cyst was made on the basis of radiographic and histologic findings. A dentigerous cyst is classified as an odontogenic cyst that results from fluid accumulating in the space between the crown of an unerupted or impacted tooth and the reduced enamel epithelium, which forms the junctional epithelium in erupted teeth.^{2,3} Expansion of these lesions has been shown to cause pathologic fractures in people and likely could cause the same in animals.²

Intraoral radiographs are necessary for proper diagnosis of dental lesions and appropriate treatment planning. Findings for the dog described in the present report illustrate the importance of obtaining intraoral radiographs if teeth are presumed to be missing. Teeth absent on oral examination may be truly absent; retained (as in this dog); or fractured with retention of the roots, which may lead to further complications and should be treated appropriately.

The finding that the cyst lining from the dog described in the present report consisted of mature stratified epithelium likely indicated that there was a keratinized component. Although dentigerous cysts generally do not contain keratin, a keratinizing component has been reported to occur as a metaplastic process.² The cystic lining of dentigerous cysts is reported to be 4 to 6 cell layers thick.² In contrast, odontogenic keratocysts are also reported to be keratinized but the epithelial lining is generally 8 to 10 cell layers thick.² Odontogenic keratocysts have a higher rate of recurrence² and therefore should be differentiated from dentigerous cysts histologically.

References

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