What Is Your Diagnosis?

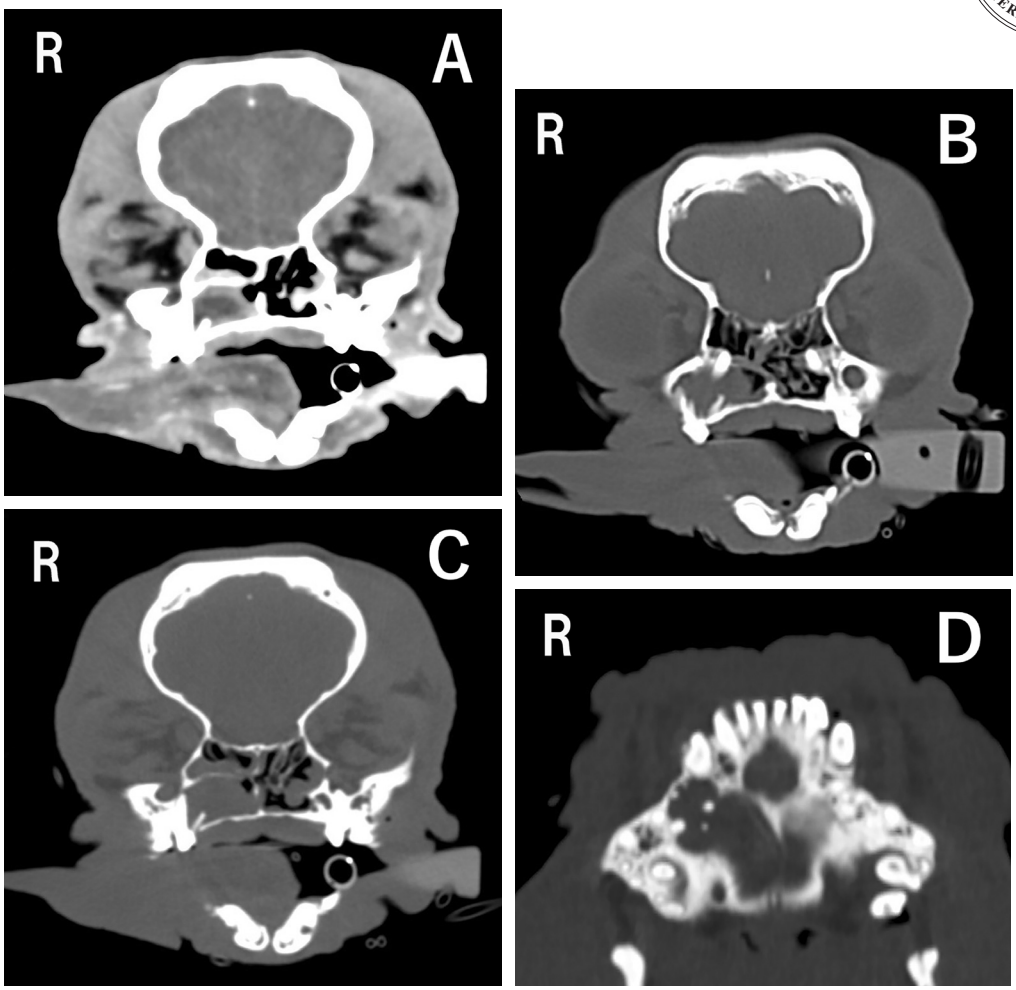

Figure 1—Transverse (A through C; dog's right is to the left) and dorsal (D) plane CT images obtained after administration of contrast medium to a 5-year-old 6.1-kg (13.4-lb) castrated male Pekingese with a 1.5-month history of intermittent nasal discharge. A—Image is at the level of the maxillary third premolar teeth in soft tissue algorithm and window. B—Image is at the level of the maxillary second premolar teeth in bone algorithm and window. C—Image is at the level of the maxillary third premolar teeth in bone algorithm and window. D—Image is at the level of the hard palate in bone algorithm and window.

History

A 5-year-old 6.1-kg (13.4-lb) castrated male Pekingese was referred to our veterinary teaching hospital because of a 1.5-month history of intermittent nasal discharge. The owner reported that the discharge was initially seen from the right nostril but became bilateral 1 month previously when the dog's sleep was disrupted by dyspnea, and that the dog had had 3 episodes of epistaxis in the past 2 weeks. On the basis of stenotic nares and an elongated soft palate noted on physical examination, concurrent brachycephalic airway syndrome was diagnosed. Results of a CBC, serum biochemical analyses, and urinalysis were within the reference limits, and nasal radiography (not shown) revealed no abnormalities. Computed tomography was performed, with initial images **(Figure 1)** obtained after a 60-second delay following IV administration of iohexol (2.0 mL/kg [0.9 mL/lb]; 300 mg of iodine/mL).

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

Findings from contrast-enhanced CT indicated that the right nasal cavity was partially filled with a soft tissue density mass (approx 1.4 × 0.8 × 1.7 cm) that lacked central contrast enhancement but had weak peripheral contrast enhancement, suggestive of a fluid-filled cyst **(Figure 2)**. The cyst included or was attached to the roots of the right second and third premolar teeth. The root of the second premolar tooth had signs of resorption, compared with the contralateral second premolar tooth. Additionally, the right maxillary palatine process contacting the cyst had slight resorption, with smooth edges, and the perpendicular lamina of the ethmoid bone was deviated to the left.

Endoscopy of the nasopharynx revealed a smooth mass protruding into the caudal aspect of the right nasal cavity and swelling of the mucosa in both nasal cavities. Histologic evaluation of an endoscopic biopsy specimen of the smooth mass revealed chronic inflammation, and on the basis of this and findings from CT, an intranasal odontogenic cyst was presumptively diagnosed.

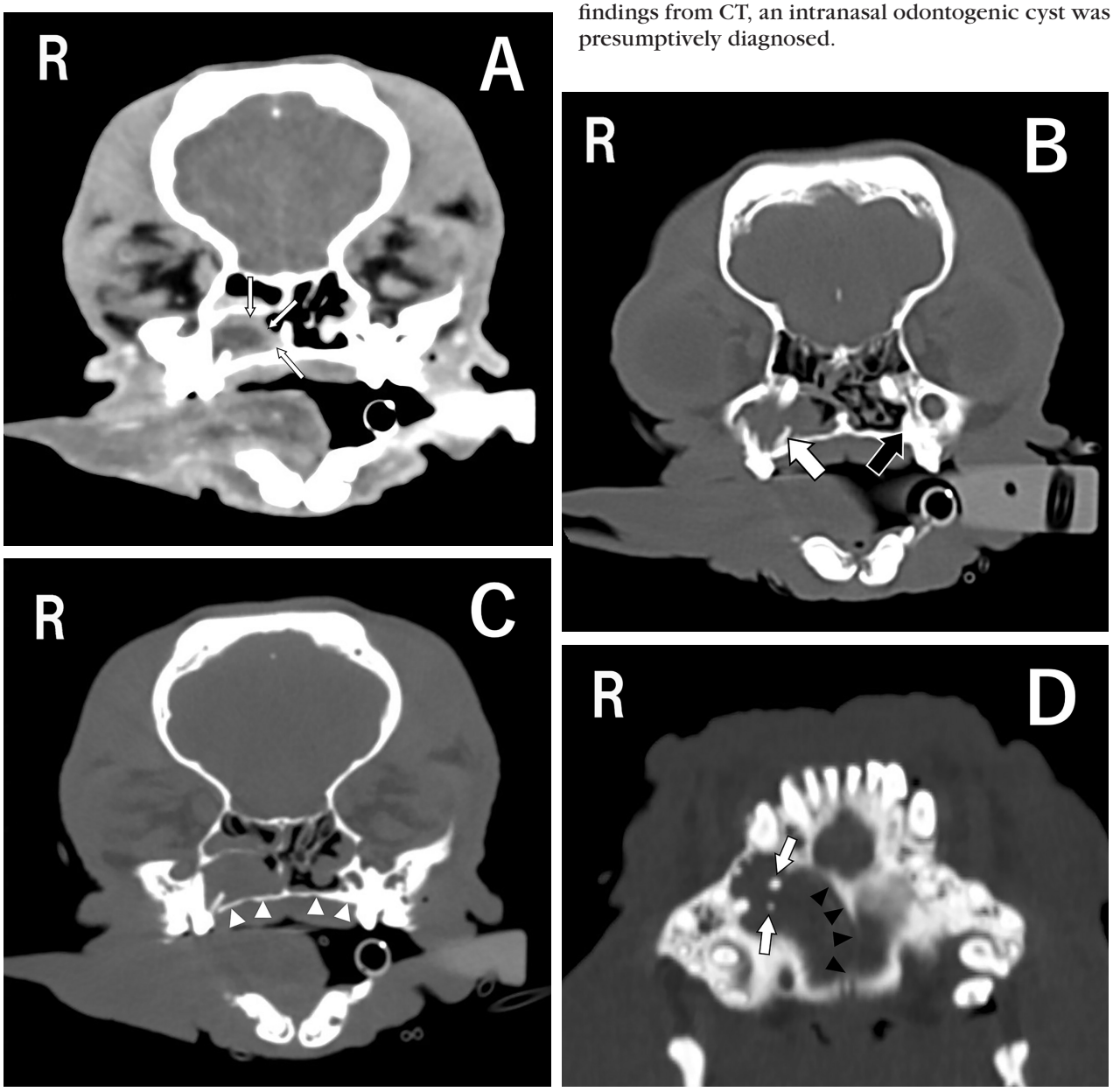

Figure 2—Same images as in Figure 1. The right nasal cavity is partially filled with a soft tissue density mass (thin white arrows; A) that has weak peripheral but no central contrast enhancement. The cyst includes or is attached to the roots of the right second and third premolar teeth. The root of the right maxillary second premolar tooth (broad white arrow; B) shows resorption, compared with that of the left maxillary left second premolar tooth (black arrow; B). Resorption is evident in the right-sided palatine process of the maxillary bones (white arrowheads; C) contacting the cyst and in the roots of the right maxillary second and third premolar teeth (broad white arrows; B and D). In addition, the perpendicular lamina of the ethmoid bone (black arrowheads) is deviated to the left.

Treatment and Outcome

The dog underwent general anesthesia and surgery to excise the cyst and treat the stenotic nares and elongated soft palate. Along with the cystic wall, the second and third premolar teeth to which the cyst was attached were also removed. The dog recovered uneventfully, and histologic evaluation of excised tissue confirmed the diagnosis of an odontogenic cyst. The dog had no nasal discharge or other abnormal signs at 2 days after surgery or during the postsurgical follow-up period (12 months).

Comments

Odontogenic cysts (ie, dentigerous cysts, radicular cysts, lateral periodontal cysts, and keratocysts) are benign lesions originating from odontogenic epithelium and are rare in dogs.[1,2] To our knowledge, there is only 1 large retrospective study[2] of this rare condition in dogs, and 29 of 41 (71%) dogs included in that study had a dentigerous cyst, mostly related to unerupted teeth.

Because odontogenic cysts are slow growing and often do not cause clinical signs, such cysts are typically large by the time of diagnosis.[3] However, resorption of adjacent bone and tooth roots is common with large cystic lesions and may lead to mandibular fractures.[3,4]

Brachycephalic dogs are more commonly affected by odontogenic cysts than are nonbrachycephalic dogs[2,3]; however, little information is available regarding odontogenic cysts that fill the nasal cavities in dogs. From our experience, affected brachycephalic dogs may snore, have dyspnea, or have nasal discharge (including epistaxis), alone or in combination. These clinical signs are similar to those of brachycephalic airway syndrome and therefore may result in misdiagnosis. However, nonbrachycephalic dogs may not show clinical signs, even when the cyst is large enough to occupy an entire unilateral nasal cavity.

In the dog of the present report, CT was useful in identifying internal characteristics of the intranasal mass and its impacts on the maxilla and involved tooth roots. Tumors and periapical tooth root abscesses could have been considered because of the space-occupying aspect of lesions in the nasal cavity; however, tumors generally have uniform contrast enhancement, and periapical abscesses involve alveolar bone around the tooth root apex, neither of which was observed in the dog of the present report. Radiographically, space-occupying lesions of nasal cavities in dogs can generally be recognized as increased unilateral or bilateral soft tissue density. Although the lesion in the dog of the present report was not observed with radiographic examination, typical radiographic findings could not be used to distinguish between nasal tumor and odontogenic cyst. However, radiographic detection of abnormally directed or located unerupted teeth can be useful information for supporting a diagnosis of odontogenic cyst. Furthermore, given the overrepresentation of such cysts in brachycephalic dogs, CT may provide veterinarians with important information on coexisting abnormalities related to brachycephalic airway syndrome (eg, thickened soft palate and abnormal turbinate formation), which should be treated concurrently.

References

1. Poulet FM, Valentine BA, Summers BA. A survey of epithelial odontogenic tumors and cysts in dogs and cats. *Vet Pathol* 1992;29:369–380.
2. 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.
3. D'Astous J. An overview of dentigerous cysts in dogs and cats. *Can Vet J* 2011;52:905–907.
4. Soukup JW, Lawrence JA, Pinkerton ME, et al. Computed tomography–assisted management of a mandibular dentigerous cyst in a dog with a nasal carcinoma. *J Am Vet Med Assoc* 2009;235:710–714.