What Is Your Diagnosis?

A 4-year-old spayed female Toy Poodle was referred to the University of Florida Veterinary Medical Center for evaluation of a right submandibular swelling. The mass had been present for 4 months and measured approximately 3 cm in diameter. The mass decreased in size following the completion of a 2-week course of amoxicillin and clavulanic acid (15 mg/kg [6.8 mg/lb], PO, q 12 h). On initial evaluation at our institution, a 4-cm-diameter, fluctuant, nonpainful mass was present ventral and caudolateral to the level of the fourth maxillary premolar tooth. A firm 3-mm prominence was observed on the ventrolateral aspect of the mass. No other abnormalities were found on physical examination. A CBC, serum biochemical analysis, and thoracic radiography were performed. Leukocytosis (20.46 X 10³ leukocytes/L; reference range, 5.0 X 10³ leukocytes/µL to 14.5 X 10³ leukocytes/µL) with mature neutrophilia (15.0 X 10³ neutrophils/µL; reference range, 3.0 X 10³ neutrophils/µL to 9.9 X 10³ neutrophils/µL) were the only abnormalities found. Cytologic examination of fluid from the mass, obtained via fine-needle aspiration, revealed a markedly cellular, moderately hemodilute sample with a dense basophilic granular background, which was consistent with a high protein content. Numerous mature, nondegenerate neutrophils were observed, and a moderate number of normal salivary gland epithelial cells were seen. No infectious or neoplastic cells were identified. Computed tomography of the skull was performed (Figure 1).

Determine whether additional imaging studies are required, or make your diagnosis from Figure 1—then turn the page →
Diagnostic Imaging Findings and Interpretation

A well-defined, mineral-attenuating structure (1,400 Hounsfield units [HU]) is located superficially within the soft tissues on the right side, ventral to the masseter muscle and lateral to the digastricus muscle at the level of the temporomandibular joint (Figure 2). This mineral-attenuating structure measures 11 mm in length and 2.2 mm in diameter. Surrounding this structure, there is contrast-enhancing thickened soft tissue, which extends rostrally to the lateral aspect of the right maxillary first molar tooth and caudally to surround the rostral aspect of the right mandibular salivary gland.

The primary differential diagnosis was a linear mineral foreign body with associated abscess formation; however, sialolithiasis with associated sialocele was also possible.

Treatment and Outcome

Fluid from the original tissue aspirate was submitted for periodic acid–Schiff staining. Results were strongly positive, indicating a high mucous content, which made parotid gland involvement less likely. These findings were consistent with a sialocele, with neutrophilic inflammation. Surgical removal of the mineral structure and evaluation of the surrounding soft tissues were performed. Once the mineral structure was isolated and removed, it was identified as a sialolith. Concurrently, the mandibular and sublingual salivary glands were removed. It was difficult to evaluate whether the sialolith was truly ductal at the time of surgery, and the salivary duct was difficult to assess because of the inflammation surrounding the gland. Mineral composition of the sialolith was determined to be 85% calcium carbonate and 15% protein. The calculus was composed of a compact admixed mass of pleomorphic calcium carbonate crystals and protein. Histologic examination revealed a moderately dilated salivary duct that contained mild-to-moderate amounts of sloughed epithelial cells. A low number of plasma cells and lymphocytes were seen separating the lobules of the salivary gland. The patient was reported to be doing well at home with no evidence of recurrence of the sialocele at the time of suture removal and at a subsequent 6-month follow-up.

Comments

Sialolithiasis is a rare condition in dogs. Mandibular sialolithiasis has only been reported for 1 dog, and the remaining reports described involvement of the parotid gland. The etiology for sialolith formation is not well-defined in the human or veterinary literature. Canine sialoliths are commonly composed of calcium carbonate or calcium phosphate inorganic mineral. In human medicine, 80% of sialoliths can be seen as mineral opacities on skull radiographs. Radiography and CT, with or without sialography, and MRI sialography have been reported as imaging modalities available for identification and assessment of sialoliths and associated anatomy, including ductal morphology, in human medicine. Reports of canine sialoliths describe mineral opacities identified on radiographs and mineral-attenuating structures identified on CT. Radiographic or CT sialography have also been reported in the veterinary literature. In a recent study on canine cadavers in which CT sialography was performed, the regions with mineral-attenuating structures were assessed and described in relation to the salivary glands and ducts. Computed tomography has been described as highly accurate for identifying sialoliths in people. Recently, susceptibility-weighted MRI has been used to detect sialoliths, which were confirmed by CT. The benefit of MRI is the reduced requirement for contrast medium or ionizing radiation. In the dog of the present report, CT sialography...
phy was not performed. In hindsight, CT sialography would have allowed assessment of the mineral structure in regard to its association with the salivary duct and additionally would have allowed assessment of the morphology of the salivary duct.

Sialolith removal was performed in the dog of the present report, which is considered to be the standard of care. In human medicine, stones can be removed by a variety of techniques, including surgical, endoscopic removal, removal by use of an endoluminal laser, or lithotripsy. Although sialoadenectomy has been described as the treatment of choice for cervical sialoceles, sialolith removal without sialoadenectomy of the associated salivary glands has been reported without recurrence. Even though it was believed that the sialocele in the dog of the present report was formed secondary to sialolith formation, it is unknown whether the sialocele would have resolved following removal of the presumed nidus.

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