History and Physical Examination Findings

A 1.7-year-old indoor domestic shorthair cat with no reported history of trauma was referred because of a missing left maxillary canine tooth. Two weeks prior to presentation, oral examination by the referring veterinarian revealed the presence of a complete set of permanent teeth, except for a persistent deciduous left maxillary canine tooth and absence of the permanent left maxillary canine tooth. Once the left maxillary deciduous canine tooth exfoliated and no permanent canine tooth erupted, the cat was referred for evaluation and diagnostic imaging.

Findings on referral physical examination were largely unremarkable, apart from reduced nasal airflow on the left side and absence of the left maxillary canine tooth. Results of a CBC, serum biochemical profile, and urinalysis were within reference limits. The cat was anesthetized, and full-mouth dental radiography (Vistas Scan; Dürr Dental) was performed (Figure 1).

Diagnostic Imaging Findings and Interpretation

Intraoral occlusal and left lateral dental radiographic images demonstrated an elongated radiopaque structure with a shape resembling a malformed maxillary canine tooth in the left rostral nasal cavity (Figure 2). These findings were suggestive of an ectopic left maxillary canine tooth.1

Cone-beam CT (CBCT; VIMAGO Imaginalis; Firenze) of the skull was performed (80 kV, 50 mA, and 0.2-mm slice thickness), and images were viewed with the use of specialized software (InVivo5; Anatomage). Findings on CT were consistent with those from dental radiography and demonstrated an elongated structure with peripheral mineral density and a radiolucent central cavity attributable to an odonto-dysplastic tooth (Figure 3). This tooth was located in the ventral meatus of the left nasal cavity and extended caudally in the left side of the choanae. Peripherally, the tooth structure was surrounded by material with irregular margins and both soft tissue and mineral attenuation values. Focal loss of the normal architecture of the nasal turbinates on the left side was also noted. The intranasal position of the left maxillary canine tooth with the crown pointing...
caudally suggested an intranasal ectopic maxillary canine tooth.²

Treatment and Outcome

To avoid future complications of nasal obstruction, potential infection, chronic nasal discharge, and oronasal fistula formation, an intraoral lateral rhinotomy was performed, and the ectopic tooth was removed. In brief, left infraorbital nerve block with 2% lidocaine was performed as preemptive analgesia, then a semilunar mucosal incision was created over the maxillary bone, starting at the level of the maxillary left third premolar tooth and continued rostro-dorsally. A mucoperiosteal flap was raised, and an osteotomy of the maxillary bone was performed (Piezosurgery; Mectron SPA). Bone removal around the root of the ectopic tooth was performed until the tooth became mobile and extraction was possible through the osteotomy site (Figure 4). The mucoperiosteal flap was closed in a simple interrupted pattern with 5-0 poliglecaprone suture (Monocryl; Ethicon Inc). The patient was discharged with a prescription of Meloxicam (0.05 mg/kg, PO, q 24 h for 5 days). On recheck examination 2 weeks after surgery, the cat showed no signs of pain and had clinical healing of the surgical wound and airflow through each nostril.

Comments

For the cat of the present report, a multimodal diagnostic imaging approach was used to diagnose an ectopic canine tooth in the nasal cavity and for surgical planning of its removal. Findings on the dental radiographic images suggested the presence of an intranasal ectopic tooth. The differential diagnosis list for radiopaque intranasal objects includes foreign body, bone sequestration, mineralized neoplasm, rhinoliths, and impacted, unerupted, intruded, or ectopic teeth.³⁻⁵ Subsequent CBCT imaging confirmed the diagnosis and allowed for precise spatial understanding of the position of the ectopic tooth in the nasal cavity and precise surgical planning.

In the present case, the canine tooth was considered ectopic and not impacted³ because it was not located in its alveolus or embedded partially or

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Figure 2—Same images as in Figure 1 showing a tooth-shaped structure (white arrows) in the left nasal cavity and angled caudomedially, with abnormal curvature of the root and the presumed apex pointing rostral rather than caudodorsal.

Figure 3—Transverse (A) and dorsal (B) plane cone-beam CT and rostral (C) and lateral (D) 3-D CT images of the skull of the cat described in Figure 1. There is an elongated structure with peripheral mineral density and a hypodense central cavity (arrows) in the left ventral meatus. This structure is surrounded by heterogeneously mineral- and soft tissue-attenuating material with irregular margins. A, B, and C—The cat’s left side is toward the right.
completely in bone. Moreover, the tooth was in an inverted position with the root toward the alveolar ridge and was therefore considered heterotopic.

Ectopic tooth is an uncommon condition with various prevalences based on the tooth type and the ectopic location. Specifically, the intranasal location is an extremely rare condition in humans. Etiologic factors are not clear and include persistent deciduous teeth, insufficient space for eruption, cleft lip and palate, trauma, and genetic predisposition.

In veterinary medicine, the prevalence of nasal ectopic teeth is unknown. However, because there are only sporadic reports on the matter, the prevalence is suspected to be very low. Regardless of the underlying cause, it is important to remove ectopic teeth to prevent future complications such as pain, infection and chronic rhinitis, nasal discharge, epistaxis, oronasal fistula, and nasal airflow obstruction. For the cat of the present report, lateral rhinotomy was performed to extract the ectopic tooth. This technique was preferred over a palatal approach due to the proximity of the tooth to the lateral aspect of the maxilla, preferred visualization of the tooth, and avoidance of damaging the palatine artery. Rhinoscopy with removal through the nostrils was excluded due to the size of the tooth.

Proper diagnostic imaging is a fundamental part of a comprehensive diagnostic and therapeutic plan for patients with a tooth or teeth suspected to be ectopic. Conventional dental radiography could be sufficient for initial diagnosis. However, for precise surgical planning, CBCT imaging eliminates superimposition of the various important anatomic structures and also provides specific information regarding the spatial relationship of surrounding structures. Findings for the cat in the present report demonstrated the importance of a comprehensive oral examination coupled with advance diagnostic imaging in a patient with an unerupted permanent tooth for diagnosis and surgical planning.

References