Diagnostic Imaging in Veterinary Dental Practice

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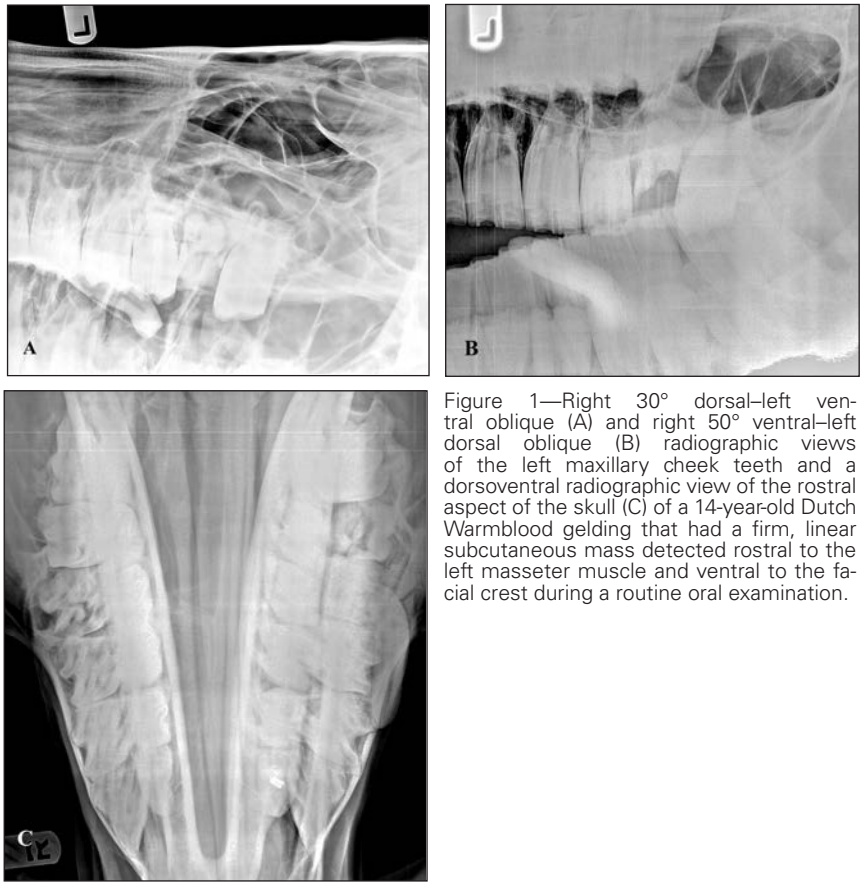

Figure 1—Right 30° dorsal–left ventral oblique (A) and right 50° ventral–left dorsal oblique (B) radiographic views of the left maxillary cheek teeth and a dorsoventral radiographic view of the rostral aspect of the skull (C) of a 14-year-old Dutch Warmblood gelding that had a firm, linear subcutaneous mass detected rostral to the left masseter muscle and ventral to the facial crest during a routine oral examination.

History and Physical Examination Findings

A 14-year-old Dutch Warmblood gelding underwent a routine oral examination. The horse had no history of dysphagia, facial swelling, nasal discharge, or prior facial trauma. Maxillofacial examination revealed a firm, linear subcutaneous mass rostral to the left masseter muscle and ventral to the facial crest. After sedation with detomidine[a] (0.015 mg/kg [0.007 mg/lb]) and butorphanol[b] (0.004 mg/kg [0.002 mg/lb]) administered IV, oral examination revealed sharp enamel points on the buccal aspects of the maxillary cheek teeth and lingual aspects of the mandibular cheek teeth. Scarring and abrasions of the buccal mucosa, < 2 cm in length, were observed adjacent to the left maxillary molar teeth. There was a complicated crown root fracture of the left maxillary second molar tooth through pulp horns 1 and 2, with loss of all clinical crown except for the buccal enamel and peripheral cementum. Feed packing in the palatal area of the missing tooth was associated with gingivitis. There was neither demonstrable mobility of the fractured tooth nor evidence of abnormal sulcular probing depths. The opposing left mandibular second molar tooth had a subjectively elongated clinical crown. Findings of a general physical examination were considered normal.

Lateral, dorsoventral, and open-mouth maxillary lateral oblique radiographs (dorsal technique [left 30° dorsal–right ventral oblique and right 30° dorsal–left ventral oblique[1]] and ventral technique [left 50° ventral–right dorsal oblique and right 50° ventral–left dorsal oblique[2]]) were obtained with a portable x-ray generator[c] and a portable computed radiography digital scanner with photostimulable phosphor plates and imaging software.[d] For the lateral oblique views, the mouth was positioned fully open with a speculum[e] and the cassette was placed on the side to be imaged (**Figure 1**).

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

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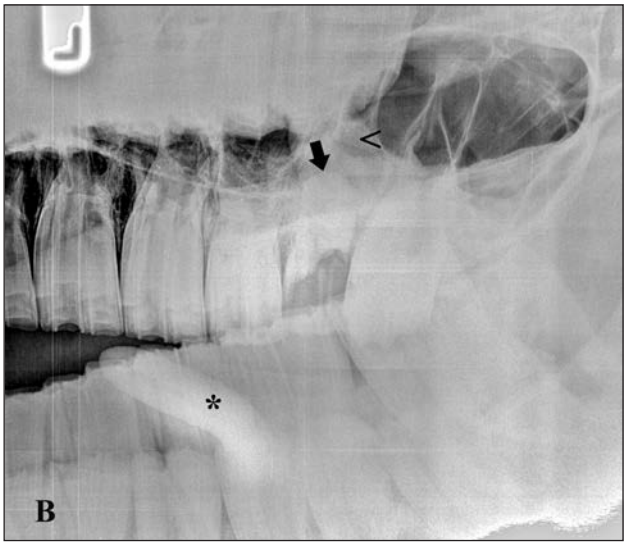

Figure 2—Same radiographic views as in Figure 1. A—In the right 30° dorsal–left ventral oblique view, a smooth-bordered, radiopaque structure approximately 65 mm in length with a linear central radiolucency (asterisk) is located in the region demarcated by the left maxillary third premolar and first molar teeth. The left maxillary second molar tooth has a complicated crown root fracture with widening of the periodontal ligament space; the roots have a blunted appearance (black arrows). Condensing osteitis (sclerotic periapical alveolar bone), thickening of the sinus epithelium, or both is present around the roots of the left maxillary second molar tooth, the mesiobuccal root of the left maxillary third molar tooth, and the rostroventral floor of the caudal maxillary sinus (carets). B—In the right 50° ventral–left dorsal oblique view, the same radiopaque structure as in panel A (asterisk) is projected over the crowns of the right mandibular cheek teeth. The left maxillary cheek teeth are projected in the space between the quadrants. Blunting of the roots of the left maxillary second molar tooth (black arrow) and periapical condensing osteitis (caret) are evident. C—In the dorsoventral radiographic view, the same radiopaque structure (asterisk) is seen lying buccal to the cheek teeth. There is a radiolucent area in the center of the second molar tooth (black arrow), which is likely due to the loss of clinical crown or infundibular caries. Condensing osteitis of the alveolar bone associated with the left third molar mesiobuccal root is evident (caret). The small radiopacity superimposed on the left mandibular second premolar tooth is a metal part of the bungee cord used to hold the radiography cassette in place.

Diagnostic Imaging Findings and Interpretation

A smoothly bordered, curvilinear, radiopaque structure with a linear radiolucent center was detected in the soft tissue of the left cheek just ventral to the left maxillary fourth premolar and first molar teeth (**Figure 2**). The left maxillary second molar tooth had blunted tooth roots, a wide periodontal ligament space around the reserve crown and roots, uniform thickening of the periapical alveolar bone, and a central radiolucency. On the basis of these radiographic and clinical examination findings, the diagnosis was made of a sialolith located in the left parotid duct and a complicated crown root fracture of the left maxillary second molar tooth.

Treatment and Outcome

Surgical removal of the sialolith and surgical extraction of the left maxillary second molar tooth were recommended. The owner elected to address the sialolith initially and defer tooth extraction until after the show season. The horse was sedated as previously described and positioned in stocks. A full mouth speculum was placed, and the head was supported with a headstand.[f] The mouth was rinsed with water, followed by a 0.12% chlorhexidine gluconate solution.[g] Lidocaine with epinephrine[h] (total dose, 3.6 mL) was injected into the submucosa overlying the sialolith with an aspirating syringe.[i] The mucosa, submucosa, and parotid duct wall overlying the sialolith were incised with a No. 10 scalpel blade on a long scalpel handle. The 40-mm linear incision created in a caudal to rostral direction was just long enough for the sialolith to be removed intraorally. The patient was administered a single IV injection of flunixin meglumine[j] (1.0 mg/kg [0.45 mg/lb]). The wound was allowed to heal by sec-

ond intention. The owner reported no postoperative abnormalities, and at the time of reexamination 90 days later, the oral mucosa at the surgical site was smooth, with no evidence of a fistula.

Comments

Equine sialolithiasis is a rare condition reported infrequently in the veterinary literature.[3–6] The manifestation in the case described in this report was typical of the condition described in horses: a nonpainful, subcutaneous, radiopaque swelling located within the cheek rostral to the masseter muscle and ventral to the facial crest, corresponding to the course of the rostral aspect of the parotid salivary duct. In 2 reports,[3,6] the sialoliths contained a central core of plant material. In the horse of the present report, efforts to section the sialolith and reveal a potential nidus resulted in shattering of the sialolith, so the core could not be analyzed.

Parotid duct sialolith surgery involves an intraoral surgical approach, which in the past required general anesthesia. Our results indicate that the intraoral procedure can be performed in standing horses with sedation and local anesthesia. As in previous reports,[3,5,6] the oral incision of the parotid duct and overlying mucosa was allowed to heal by second intention and healing was uncomplicated.

The nonstandard oblique radiographic views of the maxillary cheek teeth described in this report can provide images similar to those obtained with an intraoral technique.[2] In this patient, the sialolith was readily detected in these open-mouth oblique projections.

Delay in extraction of the fractured left maxillary second molar tooth could result in extension of the apical infection into the maxillary sinus. The absence of clinical crown in this instance would necessitate surgical extraction via a sinus (repulsion) or transbuccal approach.[7]

a. Dormosedan, detomidine hydrochloride, 10 mg/mL, Pfizer Animal Health, New York, NY.
b. Butorphic, butorphanol tartrate, 10 mg/mL, Lloyd Laboratories, Shenandoah, Iowa.
c. Ajex Meditech Ltd, Seoul, Republic of Korea.
d. ScanX12, AllPro Imaging, Metron–DVM, Epona Tech LLC Diagnostic Imaging Services, Rapid City, SD.
e. Stubbs Full Mouth Speculum, Stubbs Equine Innovations, Johnson City, Tex.
f. Cradle Style Headrest, Harlton's Equine Specialties, Elmwood, Wis.
g. Chlorhexidine gluconate oral rinse 0.12% USP, Patterson Dental, Saint Paul, Minn.
h. Lidocaine HCl 2% and epinephrine 1:100,000, Patterson Dental, Saint Paul, Minn.
i. Aspirating syringe, 1.8-mL cartridge size, Patterson Dental, Saint Paul, Minn.
j. Banamine, 50 mg/mL, Intervet/Schering-Plough Animal Health, New York, NY.

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