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Case Report Rapport de cas

Sialoendoscopy as a treatment for an obstructed mandibular salivary duct in a horse

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Abstract — A 14-year-old Quarter Horse was examined for a draining tract of 8 months' duration on the right mandible that was non-responsive to antibiotic therapy and surgical therapy. Further investigation and subsequent treatment with sialoendoscopy and ultrasonography were performed to relieve an obstruction of plant awns in the mandibular salivary duct.

Résumé — Sialo-endoscopie comme traitement pour un canal salivaire mandibulaire bloqué chez un cheval. Un cheval Quarter Horse âgé de 14 ans a été examiné pour une fistule purulente d'une durée de 8 mois à la mandibule droite qui ne répondait pas à la thérapie antibiotique et à la thérapie chirurgicale. De nouvelles investigations et le traitement subséquent à l'aide de la sialo-endoscopie et de l'échographie ont été réalisés pour éliminer un blocage du canal salivaire mandibulaire par des barbes de plantes.

(Traduit par Isabelle Vallières)

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Case description

A 14-year-old, 450-kg female Quarter Horse was evaluated at the University of California, William R. Pritchard Veterinary Medical Teaching Hospital (VMTH) for a draining tract of 8 mo duration on the right caudal mandible that had intermittently been treated with an unknown dose of trimethoprim sulfamethoxazole (TMS). The draining tract was located 5 cm rostral of the ramus of the mandible and was on the medial aspect of the right hemi-mandible (Figure 1). The horse was kept on a dry pasture lot with access to supplemental grass hay. With the exception of the draining tract, physical examination was normal with no evidence of lymphadenopathy or nasal discharge. Radiographs of the mandible showed no evidence of a sequestrum, radio-opaque foreign body, or osteomyelitis. Ultrasonographic examination of the salivary structures revealed a suspected plant foreign body within the mandibular salivary duct without associated sialoadenitis. Oral examination did not reveal any dental abnormalities although the right sublingual caruncle was thickened and erythematous.

Due to the chronicity of the mandibular draining tract and poor response to antibiotics, surgery was undertaken to remove the foreign body. Under general anesthesia, a 5 French polyethylene catheter was inserted into the draining tract and an incision was made following the catheter to the salivary duct. A second 5 French catheter was introduced into the salivary duct orally via the sublingual caruncle and was flushed with sterile saline until the foreign body was retropulsed to the surgical opening in the duct. The foreign body was removed, and the salivary duct and surgical site were closed with a simple interrupted pattern. At the time of surgery a sample of purulent material from within the salivary duct was taken and cultured *Pasteurella caballi* and *Truperella pyogenes,* both of which were sensitive to TMS. The horse was discharged on a 1-month course of TMS (Trimethoprim and sulfamethoxazole; Amneal Pharmaceuticals, Hauppauge, New York, USA), 30 mg/kg body weight (BW), PO, q12h. Repeat examinations by the referring veterinarian over the next 6 mo showed that the discharge decreased but never ceased.

Examination at the VMTH 6 mo after surgery confirmed a right-sided, ulcerated, ~2-cm diameter soft tissue mass caudal to the ramus of the right mandible with purulent material discharging from a 2-mm draining tract. No other abnormalities were found on physical examination. A repeat oral examination was performed and no abnormalities were noted except the erythematous and swollen right sublingual caruncle. Ultrasonographic examination of the region revealed multiple plant awn foreign bodies within the right mandibular salivary duct. The linguofacial vein was noted to be directly overlying the mandibular salivary duct complicating surgical access to the foreign bodies. Ultrasound-guided removal of the foreign bodies using endoscopic biopsy forceps passed orally through the sublingual caruncle to the site of obstruction was successful in removing 2 plant awns. Antegrade flushing via the patent draining tract was performed to allow for distention of the salivary duct and easy passage of the biopsy forceps for removal of

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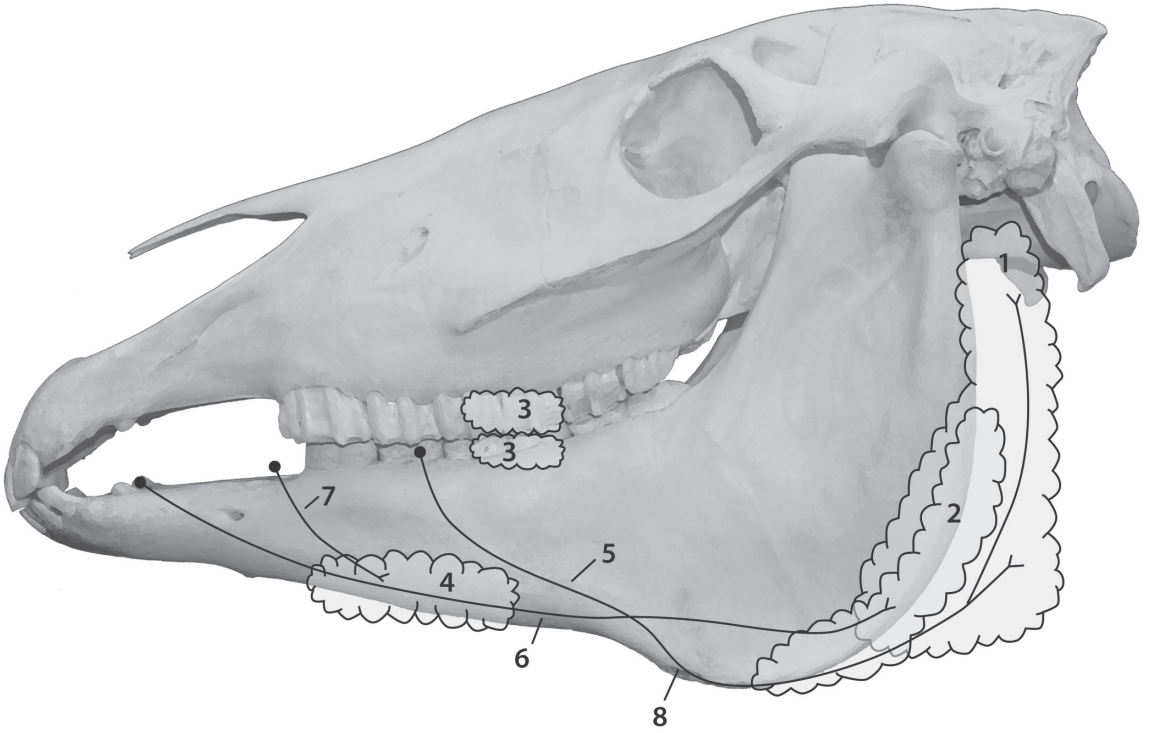

Figure 1. Diagram depicting the location of salivary glands, ducts, and draining tract:

1. Parotid gland. Occupying the space between the caudal border of the mandible, the wing of the atlas, and the base of the ear. Ventrally it extends to the linguofacial vein.
2. Mandibular gland extends from the basihyoid to the atlantal fossa and is covered laterally by the parotid gland.
3. Buccal glands form 2 rows along the dorsal and ventral borders of the buccinator muscle.
4. Sublingual gland is directly under the oral mucosa between the tongue and the medial surface of the mandible from the level of the chin to about the third cheek tooth.
5. Parotid duct. The duct accompanies the facial artery and vein and opens into the oral vestibule opposite the 2nd or 3rd upper cheek tooth.
6. Mandibular duct opens on the floor of the mouth a few centimeters caudal to the incisors.
7. The sublingual gland has many small excretory ducts that open on small papillae below the tongue.
8. Chronic draining tract on the duct.

additional plant awns. Repeat ultrasonographic evaluation after distention of the duct confirmed multiple additional foreign bodies within the salivary duct (Figure 1). The owner consented to additional diagnostics, and sialoendoscopy was scheduled for the following day.

At the time of sialoendoscopy, an Alumispec equine speculum (Veterinary Dental Products, Elmwood, Wisconsin, USA) was placed to facilitate access to the oral cavity. Incremental doses of detomidine (Pfizer, New York, New York, USA) and butorphanol (Torbugesic; Zoetis, Fort Dodge, Iowa, USA) were given via a jugular intravenous catheter to achieve adequate sedation. A 2.5-mm diameter endoscope was introduced into the right mandibular salivary duct through the right sublingual caruncle. The lumen of the duct was noted to be severely erythematous with large amounts of fibrin likely due to a chronic active inflammatory process (Figure 2). Lidocaine (Lidocaine hydrochloride 2%; VetOne, Boise, Idaho, USA), 20 mL, was infused into the duct to facilitate passage of the endoscope. Multiple foreign bodies (plant awns and hay) were noted along the length of the duct from the caruncle to the draining tract. Dilute betadine was infused via the draining tract to dilate the salivary duct to aid with visualization and foreign bodies were removed using biopsy forceps through the biopsy channel in the endoscope. The procedure was continued for 2 h and approximately 20 plant awns and multiple blades of hay were removed. Multiple plant awns were still present within the salivary duct, but the treatment was discontinued due to the length of the procedure and the amount of sedation administered. Dexamethasone SP (VetOne, Meridian, Idaho, USA), 0.2 mg/kg BW, was infused into the duct to reduce inflammation and the horse was discharged with dexamethasone (VetOne), 0.04 mg/kg BW, PO, q24h, flunixin meglumine (Merck Animal Health, Intervet, Summit, New Jersey, USA), 0.5 mg/kg BW, PO, q12h, and TMS (Amneal Pharmaceuticals), 30 mg/kg BW, PO, q12h. The owners were instructed to feed a pelleted diet and to eliminate access to pasture to reduce exposure to hay and plant awns. Re-examination was scheduled for 2 wk later.

At re-examination the draining tract on the mandible was reduced in size but was still present. The 2.5-mm endoscope was passed into the right sublingual caruncle and a stricture was noted at 10 cm from the ostium that would not allow passage of the endoscope. Initial attempts to pass the endoscope through the stricture were unsuccessful due to the flexibility of the endoscope. Biopsy forceps were passed through the stricture and allowed the endoscope to be advanced with gentle pressure. Plant awns were visualized, but antegrade removal of

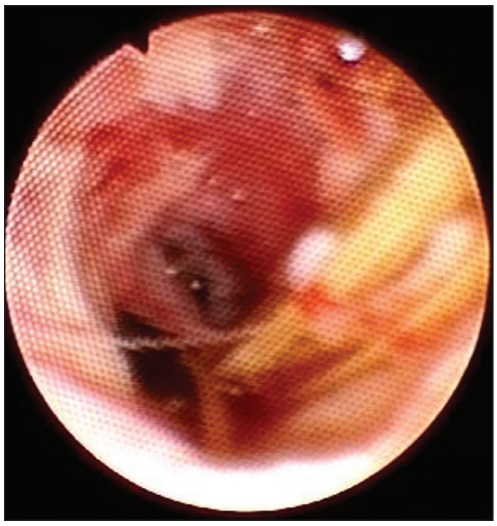

Figure 2. Mandibular salivary duct showing severe erythematous mucosa and fibrin accumulation. Plant material can also be seen.

the awns was unsuccessful. The endoscope was inserted into the draining tract and approximately 15 to 20 grass awns were removed via the draining tract using endoscopic biopsy forceps. After 2.5 h multiple plants awns were still visible in the duct but significant hyperemia and inflammation developed resulting in discontinuation of the procedure. Dexamethasone SP (VetOne), 0.2 mg/kg BW, IV, was infused into the right salivary duct to reduce inflammation and the horse was discharged on the same medications as described previously. Sialoendoscopy was performed a week later and additional plant awns were removed from the salivary duct until none were visualized. Re-examination was performed 2 wk later confirming resolution of the draining tract and a patent salivary duct. At this time all medications were discontinued and the owner was advised to continue to restrict the horse's diet to pellets and eliminate pasture access to reduce the risk of hay or plant awn intake. Six months following discharge the horse was reported to be clinically normal with no draining tract present.

This is the first report of the use of sialoendoscopy and dynamic ultrasound for the diagnosis and removal of foreign bodies within the mandibular salivary duct. Septic sialoadenitis (1) is an uncommonly reported disease in the horse with limited treatment options available. In a recent study, Kilcoyne et al (1) showed that 33% of cases of septic sialoadenitis had a sialolith as a predisposing factor. They showed that *Fusobacterium* sp. along with other aerobic and anaerobic bacteria were cultured in 50% of their cases. In the current case the bacteria cultured were *Pasteurella caballi* and *Truperella pyogenes* indicating that other bacteria may also be involved.

Diagnosing the underlying etiology of draining tracts in the mandibular region is difficult due the complex anatomy of the skull. Radiography is limited by summation and superimposition when looking for small foreign bodies although large, or radio-opaque sialoliths can be seen on radiographs (2). Ultrasound can be used for examination of the salivary glands and their associated ducts, although advanced ultrasonography skills are required (3). The use of ultrasonography in this case allowed complete evaluation of the salivary glands and ducts and aided in the visualization of foreign bodies. Dynamic ultrasound was used to manipulate and remove the plant awns although the technique underestimated the number of plant awns, present in the salivary duct due to superimposition and progressive gas accumulation within the duct. Sialoendoscopy was therefore required for identification of location and extent of multiple foreign bodies. Other potential diagnostics indicated include advanced imaging modalities (computed tomography or magnetic resonance imaging) although these both frequently require general anesthesia and the inherent risks associated with anesthesia.

In the case herein, the opening of the mandibular salivary duct into the oral cavity was located under the tongue 3 cm rostrolateral to the lingual frenulum at the sublingual caruncle. Cannulation was achieved using a 5 French polyethylene catheter and lavage was performed with a sterile saline solution. Cannulation and use of the endoscope was facilitated by a widened sublingual caruncle on the right side compared with the left. The widening was speculated to be due to the chronic inflammation and infection. A 2.5-mm endoscope was used for visualization although in some cases a smaller endoscope may be required.

Indications for sialoendoscopy include diagnostic evaluation of sialadenitis, unexplained swelling or draining tracts at the ramus of the mandible, salivary gland swelling, or localization of a sialolith. Sialendoscopy has been described to aid in sialolith retrieval or fracture using lithotripsy in humans (4). The only contraindication to the technique is in acute sialadenitis as the use of an endoscope, dilator systems, or irrigation could increase the likelihood of spread of infection or stenosis in humans (5).

Strictures of the salivary duct are complications that occur secondary to inflammation, infection, and trauma during surgical procedures and can limit the use of sialoenoscopy in humans (6). In the present case we were able to pass the endoscope through the stricture by using the biopsy forceps as a guide wire and a stabilizing instrument. The administration of topical and systemic dexamethasone was intended to reduce inflammation and the risk of stricture formation within the salivary duct. Although no studies have been performed on the efficacy of steroids in reducing the risk of stricture formation in salivary ducts (7), the efficacy of intralesional steroids in reducing the risk of recurrence in esophageal strictures has been confirmed in humans (8) and this approach has been attempted in horses (9), and extrapolated to this case.

The precise etiology of the salivary duct obstruction in this case was unclear. It was speculated that the diet consisting of large amounts of plant awns initially led to migration of an awn into the salivary duct. This initial migration may have subsequently lead to dilation of the duct allowing for migration of more awns.

Sialoendoscopy is a novel technique not previously reported in the veterinary literature as both a diagnostic and treatment modality. The technique allowed complete resolution of a chronically obstructed mandibular salivary duct which would otherwise have required extensive surgery for resolution. The

procedure was well-tolerated by the horse in this case with standing sedation; therefore, bypassing the risk of general anesthesia.

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