Use of intralesional formalin administration for treatment of a subepiglottic cyst in a horse

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Case Description—A 4-year-old horse was evaluated for chronic coughing, mucopurulent nasal discharge, and failure to thrive. The horse had been adopted from the Bureau of Land Management approximately 6 months prior to examination. The horse had been treated by the owner under the direction of the local veterinarian with 2 separate courses of doxycycline with no improvement in clinical signs. Physical examination revealed the horse to be bright and alert with normal vital signs but with a rough hair coat and moderately low weight. There was clear mucoid discharge present from both nostrils. Lung auscultation with a rebreathing bag revealed no abnormalities. A cough could not be elicited.

Clinical Findings—Endoscopy was performed on the larynx, pharynx, and trachea and revealed an approximately 2-cm fluctuant subepiglottic cyst. The cyst appeared to have a wide base of attachment to the ventral aspect of the epiglottis. The soft palate was located ventral to the epiglottis and did not become displaced during the examination. Food material was present in larynx, pharynx, and nasal passages throughout the length of the trachea. On the basis of the appearance and location of the cyst, a diagnosis of a subepiglottic cyst was made.

Treatment and Outcome—The subepiglottic cyst was treated with intralesional formalin administration. Following 2 injections, 2 weeks apart, the cyst was completely resolved with no evidence of scarring or epiglottic deformity.

Clinical Relevance—Findings suggest that intralesional formalin administration for treatment of subepiglottic cysts may be a minimally invasive, economically suitable alternative to surgical treatments. (J Am Vet Med Assoc 2008;233:463–465)

A 4-year-old Bureau of Land Management Mustang mare was evaluated for chronic coughing, mucopurulent nasal discharge, and failure to thrive. The horse had been adopted from the Bureau approximately 6 months prior to examination. The horse had been treated by the owner under the direction of the local veterinarian with 2 separate courses of doxycycline with no improvement in clinical signs. Physical examination revealed the horse to be bright and alert with normal vital signs but with a rough hair coat and moderately low weight. There was clear mucoid discharge present from both nostrils. Lung auscultation with a rebreathing bag revealed no abnormalities. A cough could not be elicited.

An endoscopic examination of the larynx, pharynx, and trachea was performed without sedation. A fluctuant cyst approximately 2 cm in diameter was identified on the right side of the ventral aspect of the epiglottis (Figure 1). The cyst appeared to have a wide base of attachment to the ventral aspect of the epiglottis. The soft palate was located ventral to the epiglottis and did not become displaced during the examination. Food material was present in larynx, pharynx, and nasal passages throughout the length of the trachea. On the basis of the appearance and location of the cyst, a diagnosis of a subepiglottic cyst was made.

At this time, options for treatment were discussed with the owner and included surgical resection,1 snare excision, or laser ablation of the cyst.2 Because of economic constraints, surgical resection and laser ablation were not viable options. The standing snare excision technique did not appear to be a viable option in this case because of the wide base of attachment of the cyst. Because of these limitations, the owner was also offered the option of intralesional formalin injection. Although intralesional formalin administration for treatment of a subepiglottic cyst has not been previously reported, to the authors’ knowledge, previous uses for intralesional administration of formalin for treatment of epidermal inclusion cysts3 and ethmoid hematoma4 appeared to make this treatment viable and low cost.

The horse was sedated with xylazine hydrochloride (200 mg, IV), and a flexible 1-m endoscope was passed through the left nostril to the level of the pharynx. A polypropylene endocatheter was passed through the biopsy channel of the endoscope, and the rostral aspect of the cyst was topicaly anesthetized with 10 mL of lidocaine hydrochloride. After removal of the endoscope from the nostril, a 16-gauge needle was attached with cyanoacrylate to the exposed biopsy channel of the endocatheter after removal of the needle hub. After protecting the exposed needle end within the most distal aspect of the endoscope, the endoscope was again passed through the left nostril to the level of the pharynx. After reaching the correct position, the endocatheter (with attached needle) was advanced into the cyst.

Figure 1—Endoscopic view of a subepiglottic cyst in a horse prior to treatment via intralesional administration of formalin.
Approximately 20 mL of slightly cloudy fluid was aspirated from the cyst, which was not analyzed because of economic constraints. The needle was left in place, and approximately 10 to 15 mL of neutral-buffered 10% formalin was injected into the cyst until fluid leaked out around the injection site. Because of the presence of feed material in the trachea, administration of a 30-day course of trimethoprim-sulfadimethoxazole was begun for treatment of potential aspiration pneumonia, and the horse was discharged.

After 14 days, the horse was returned for reevaluation. Physical examination again revealed the horse to be bright and alert, without abnormal findings. Clear mucoid bilateral nasal discharge was still present, but the owner reported improvement in the amount of nasal discharge seen since the previous visit. The horse was sedated with a combination of butorphanol (5 mg, IV) and detomidine hydrochloride (5 mg, IV). The endoscopic examination was performed as described and revealed reduction in the size of cyst by approximately 50%. A second intralesional injection of neutral-buffered 10% formalin was administered as described.

Four weeks after the initial evaluation, the horse's physical condition had substantially improved (improvement in the hair coat and increased body weight). There was complete resolution of the nasal discharge. The owner reported an increase in the amount of coughing and nasal discharge for 5 days following the second intralesional injection, followed by a substantial reduction and eventual resolution of these signs. The horse was sedated with a combination of butorphanol (5 mg, IV) and detomidine hydrochloride (5 mg, IV), and an endoscopic examination was performed, which revealed complete resolution of the subepiglottic cyst; no evidence of subepiglottic scarring; normal position of the soft palate; no evidence of pharyngeal irritation; and resolution of the feed material in the larynx, pharynx, nasal passages, and trachea (Figure 2).

Figure 2—Endoscopic view of the horse in Figure 1 after 2 treatments with intralesional administration of formalin, approximately 4 weeks after initial evaluation. Notice complete resolution of the cyst and absence of epiglottic deformity and cicatrix formation.

Thirteen months and 42 months after the initial examination, the horse was returned upon request for endoscopic reevaluation. At both times, the owner reported that the horse was doing well and had no evidence of nasal discharge, coughing, dysphagia, exercise intolerance, or respiratory stridor since the second intralesional formalin injection. Physical examination at both examinations revealed the horse to be bright and alert with no abnormal findings. The horse was sedated prior to the endoscopic examinations, which revealed a completely normal larynx, pharynx, and trachea, as seen at the 4-week examination period.

Discussion

Subepiglottic cysts have been reported to develop predominantly in foals either through a congenital abnormality of a remnant of the thyroglossal duct or an inflammatory or traumatic etiology. Although infrequent, subepiglottic cysts have been reported in adult horses with no previous history of respiratory problems. In the case reported here, the etiology could be identified because the horse had only recently been captured and adopted.

Treatment options for subepiglottic cysts that have been reported in the literature include surgical resection or endoscopic-guided snare excision or laser ablation. Proposed advantages of surgical resection via a ventral laryngotomy or pharyngotomy incision include preservation of the mucosa surrounding the cyst, which may decrease scar formation and secondary epiglottic dysfunction. More recently, endoscopic-guided snare excision or neodymium:yttrium aluminum garnet laser ablation of subepiglottic cysts have been reported. Regardless of the approach, complete removal of the secretory lining of the cyst is necessary to eliminate the potential for recurrence. In addition, concerns have been raised for all techniques regarding subepiglottic cicatrix formation and secondary dorsal displacement of the soft palate associated with epiglottic deformity.

Intralesional administration of formalin has been reported as a minimally invasive, low-cost treatment of ethmoid hematomas, epidermal inclusion cysts, and traumatic injuries of the parotid salivary gland in horses. It is believed that the mechanism of action of formalin treatment is desiccation and coagulation of the tissue. Documented adverse effects following formalin injection for treatment of ethmoid hematomas have included laminitis and sudden onset of acute fatal neurologic signs. However, fewer adverse effects were reported with intralesional administration of formalin, compared with intralesional administration of silver nitrate or administration of chlorhexidine. No substantial adverse effects beyond nasal irritation and epistaxis were reported with intralesional administration of formalin in the treatment of epidermal inclusion cysts.

To the authors' knowledge, this represents the first reported use of intralesional administration of formalin for treatment of subepiglottic cysts. The procedure was completed quickly and was minimally invasive and economically suitable to the owner. As reported with formalin treatment of ethmoid hematomas, multiple injections may be necessary to result in complete resolution of the cyst. This could be dependent on the initial...
size of the lesion, but further investigation is required to confirm this. Additional clinical cases are required to fully determine any adverse effects of formalin to the surrounding pharyngeal and laryngeal tissues or possible recurrence of the cyst.

References

Selected abstract for JAVMA readers from the American Journal of Veterinary Research

Pharmacokinetics of florfenicol in serum and synovial fluid after regional intravenous perfusion in the distal portion of the hind limb of adult cows
John N. Gilliam et al

Objective—To define the pharmacokinetics of florfenicol in synovial fluid (SYNF) and serum from central venous (CV) and digital venous (DV) blood samples following regional IV perfusion (RIVP) of the distal portion of the hind limb in cows.

Animals—6 healthy adult cows.

Procedures—In each cow, IV catheters were placed in the dorsal common digital vein (DCDV) and the plantar vein of the lateral digit, and an indwelling catheter was placed in the metatarsophalangeal joint of the left hind limb. A pneumatic tourniquet was applied to the midmetatarsal region. Florfenicol (2.2 mg/kg) was administered into the DCDV. Samples of DV blood, SYNF, and CV (jugular) blood were collected after 0.25, 0.50, and 0.75 hours, and the tourniquet was removed; additional samples were collected at intervals for 24 hours after infusion. Florfenicol analysis was performed via high-performance liquid chromatography.

Results—In DV blood, CV blood, and SYNF, mean ± SD maximum florfenicol concentration was 714.79 ± 301.93 µg/mL, 5.90 ± 1.37 µg/mL, and 39.19 ± 29.42 µg/mL, respectively; area under the concentration versus time curve was 488.14 ± 272.53 h•µg•mL–1, 23.10 ± 6.91 h•µg•mL–1, and 113.82 ± 54.71 h•µg•mL–1, respectively; and half-life was 4.09 ± 1.93 hours, 4.77 ± 0.67 hours, and 3.81 ± 0.81 hours, respectively.

Conclusions and Clinical Relevance—Following RIVP, high florfenicol concentrations were achieved in DV blood and SYNF, whereas the CV blood concentration remained low. In cattle, RIVP of florfenicol may be useful in the treatment of infectious processes involving the distal portion of limbs. (Am J Vet Res 2008;69:997–1004)

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