Case Report Rapport de cas

Submandibular lymph node abscess caused by Actinomyces denticolens in a horse in Ontario

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Abstract – This is the first report of the isolation of Actinomyces denticolens, an opportunistic pathogen, from a draining submandibular lymph node abscess in a horse in Ontario. Due to the similarity of the clinical signs with strangles, this pathogen should be included in the differential diagnosis of submandibular lymphadenopathy in the horse.

Résumé – Abcès des ganglions lymphatiques sous-maxillaires chez un cheval causé par Actinomyces denticolens. Il s’agit du premier rapport d’isolement d’Actinomyces denticolens, un agent pathogène opportuniste, lors du drainage d’un abcès d’un ganglion lymphatique sous-maxillaire chez un cheval en Ontario. En raison de la similarité des signes cliniques avec ceux de la gourme, cet agent pathogène devrait être inclus dans le diagnostic différentiel d’une lymphadénopathie sous-maxillaire chez le cheval.

(Abcotted par Isabelle Vallières)

A 6-year-old Thoroughbred gelding was presented to the Ontario Veterinary College Teaching Hospital for evaluation and treatment of left submandibular lymphadenopathy and abscessation. Swelling of the left submandibular lymph node was noted 10 d prior to presentation and was of unknown duration.

Case description

On initial physical examination, the horse appeared bright, alert, and responsive and the vital parameters were unremarkable. No nasal discharge or signs of upper respiratory tract infection were observed. There was an active purulent discharge from the affected submandibular lymph node. The lymph node was surrounded by mild edema and was mildly painful and warm on palpation. No other peripheral lymph nodes were enlarged or painful. Hematology and a serum biochemistry profile showed no abnormalities.

Among differential diagnoses, infections with bacterial pathogens (such as Streptococcus equi subsp. zooepidemicus, S. equi subsp. equi, Corynebacterium pseudotuberculosis), were high on the list, followed by trauma, and the presence of a foreign body. The horse was sedated with xylazine (Rompun; Bayer, Toronto, Ontario), 0.3 mg/kg body weight (BW), IV, and a sample of the purulent material from the draining tract was collected aseptically and submitted to the Animal Health Laboratory for aerobic and anaerobic culture and sensitivity. In addition, since the horse had been receiving antimicrobials [oral trimethoprim (2 mg/kg), pyrimethamine (1 mg/kg), and sulfadiazine (10 mg/kg)] prior to admission for suspected equine protozoal myeloencephalitis, polymerase chain reaction (PCR) to detect S. equi subsp. equi DNA from the purulent material was also requested. The draining tract was then enlarged using a #15 blade and 2 well-defined lobules were incised but no purulent material could be drained from either lobule. No foreign body could be palpated. The horse was placed in the isolation unit pending bacteriology results. Treatment consisted of placing hot packs on the left submandibular area and lavaging the abscess with 1% iodine solution (Dovidine Solution, Laboratoire Atlas, Montréal, Québec) twice daily until closure of the incisions (3 d after admission). The surrounding edema resolved by day 5 of admission despite the remaining lymphadenopathy.

Streptococcus equi subsp. equi was not detected by PCR (1) and no anaerobes were isolated. Aerobic culture (received on day 5 of hospitalization), however, yielded a pure culture of gram-positive rods in large numbers. Based on preliminary biochemical identification the organism was identified as an Actinomyces sp. Further identification was based on partial 16S rRNA sequencing as described previously (2). Sequencing revealed that this organism was closely related to Actinomyces denticolens with 98% nucleotide homology and 96% query coverage. Based on the bacteriology results procaine penicillin...
G (Pen Aqueous; Wyeth Animal Health, Guelph, Ontario), 22 000 IU/kg BW, BID, IM, was added to the treatment of hot packing and lavaging on day 5 for a total duration of 7 d. The horse was discharged from the hospital 7 d after presentation. On follow-up 1 mo after discharge, the owner reported that the abscess had resolved and that a small amount of scar tissue remained over the affected area.

**Discussion**

*Actinomyces* spp. are gram-positive, non-motile, non-spore-forming anaerobic to facultatively anaerobic rods that may show branching. They are common commensals of the oral cavity and gastrointestinal tract of humans and many animal species including horses (3–7). In horses, *Actinomyces* spp. have been associated with occasional infections such as submandibular lymphadenopathy (8–12), fistulous withers and poll evil (13), skin pustules and nodules (5), and mandibular osteomyelitis (14). Various species of *Actinomyces* have been associated with these clinical presentations including *A. viscosus*, *A. odontolyticus*, and more recently *A. denticolens*. *Actinomyces denticolens* was first described in 1984 after being isolated from dental plaque of healthy cattle (15). Subsequently, *A. denticolens* was isolated from the oral cavity and lower respiratory tract of healthy horses, donkeys, and cats (3,6). Recently, this bacterium was also reported as a causative agent of submandibular abscesses in horses in Switzerland and California (11,12).

To our knowledge, this is the first report describing isolation of *A. denticolens* from an abscess in a horse in Ontario. Interestingly, during our case diagnostic workup, an abscess swab from another horse from Ontario suspected of having strangles was submitted to the Animal Health Laboratory for culture and for PCR to detect *S. equi* subsp. *equi*. Gram stain on the purulent discharge revealed a large number of gram-positive branching rods and culture and PCR tests were both negative for *S. equi* subsp. *equi*. *Actinomyces* sp. was isolated from the submitted sample. Further speciation of this isolate was also carried out by partial 16S rRNA sequencing. The results of sequencing indicated that the isolate from this case shared 98% nucleotide homology with *A. denticolens*.

Because the range of clinical signs and the anatomic location of *A. denticolens* abscesses highly resemble strangles it is important that veterinarians in Ontario include this organism as a possible rule-out when dealing with strangles suspects. In some cases the clinical presentation is different from strangles with no evidence of pyrexia, depression, or nasal discharge as in our case. However, in most cases both diseases are clinically similar and it is advisable to quarantine the patient until the final diagnosis is established. To help with the initial rule-out of strangles, *Streptococcus* spp. will appear as gram-positive cocci frequently in chains, whereas *Actinomyces* spp. will be seen as gram-positive pleomorphic rods. Antimicrobial use, however, can change bacterial cell morphology and, based on our experience, *Streptococcus* spp. can become crescent-shaped making interpretation of the Gram stain difficult. The absence of bacteria on smears, however, does not exclude either cause of lymphadenopathy and Gram stain should be followed by bacterial culture since, at present, this is the only way to confirm the presence of *Actinomyces* spp. Further speciation of *Actinomyces* spp. may prove to be challenging for a routine diagnostic laboratory because of very poor biochemical characterization of the species belonging to this genus. Advanced molecular methods such as 16S rRNA sequencing may have to be used.

In summary, this is the first report of the isolation of *Actinomyces denticolens* from a horse in Ontario; this organism should be included in the differential diagnosis of submandibular lymphadenopathy in horses.

**References**