

A case report of ulcerative lymphangitis (a mini review of causes and current therapies)

Fereydon REZAZADEH ZAVOSHTI*, Amir Babak SIOOFY-KHOJINE, Hassan Ali MAHPEIKAR

Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Tabriz, Tabriz - IRAN

Received: 10.12.2007

Abstract: Ulcerative lymphangitis, or pigeon fever, is a bacterial infection of the lymphatic vessels of the skin in horses, cattle, sheep, and goats. *Corynebacterium pseudotuberculosis* is the classical cause of the disease. However, other pathogens such as *Staphylococcus aureus* have been isolated from cases of ulcerative lymphangitis. The aim of this report is to review the causes of pyoderma and skin abscesses in horses with specific attention to *Staphylococcus aureus*. A 10-year-old Thoroughbred stallion was examined in the suburbs of Tabriz (northwest of Iran) in February 2007. Skin abscesses were present around the hock joints on the hind limbs, on the chest, and on abdominal and neck skin ranging from 0.5 to 6 cm in diameter. A few of these abscesses drained to the surface of the skin and contained bright green purulent discharge. Bacterial culture confirmed the presence of *Staphylococcus aureus*. Based on the clinical examination and laboratory findings the case was diagnosed as ulcerative lymphangitis. Antibiotic therapy included procaine penicillin G (30,000 IU/kg, IM, bid) and streptomycin (3 g, IM, bid) both for 15 days, and Phenylbutazone (10 mg/kg, IM, sid) for 3 days. The therapy was immediately successful.

Key words: *Staphylococcus aureus*, ulcerative lymphangitis, horse

Introduction

Bacterial pathogens such as *Staphylococcus aureus*, *Corynebacterium pseudotuberculosis*, and *Dermatophilus congolensis* are important causes of pyoderma in horses (1). The disease is known to be zoonotic and could be transmitted to man (2-4). Ulcerative lymphangitis is a financial burden on owners, as shown by a study in the USA with an estimated cost of \$139 (range \$100 to \$ 850) for 13 days of standard treatment (5,6). The disease may cause lameness and deformity of the limbs in affected animals, which will affect the performance of the horse (2,6,7).

Case history

A 10-year-old Thoroughbred stallion was examined in the suburbs of Tabriz (East Azerbaijan) in February 2007. The horse had a post-exercise respiratory disorder and on physical examination it had an abnormal breathing rhythm. The main complaint according to the owner was purulent exudates from abscesses on the skin of the hind limbs (Figure 1), chest (Figure 2), and neck (Figure 3), which had not responded to previous unknown treatment. The horse had tachycardia (72/min), the respiratory rate was 28/min, and rectal temperature after 2 min was 37.4 °C. Poor quality feed, lack of

* E-mail: f_rezazadeh@tabrizu.ac.ir

ventilation of the stable, and lack of manure removal from the stable were observed (Figure 3). Samples were collected from one of the abscesses on the neck area under sterile conditions. Bacterial cultures were followed by biochemical tests and confirmed the presence of *Staphylococcus aureus* infection. Based on clinical examination (affected area and clinical signs including abscesses and edema on the hind limbs) and laboratory findings, the final diagnosis was ulcerative lymphangitis. Antibiotic therapy was started with procaine penicillin G (30,000 IU/kg, IM, bid) and streptomycin (3 g, IM, bid) for 15 days. Phenylbutazone was administered (10 mg/kg, IM, sid)



Figure 3. Distribution of the abscesses on the right forelimb and shoulder; note the stable in the background.

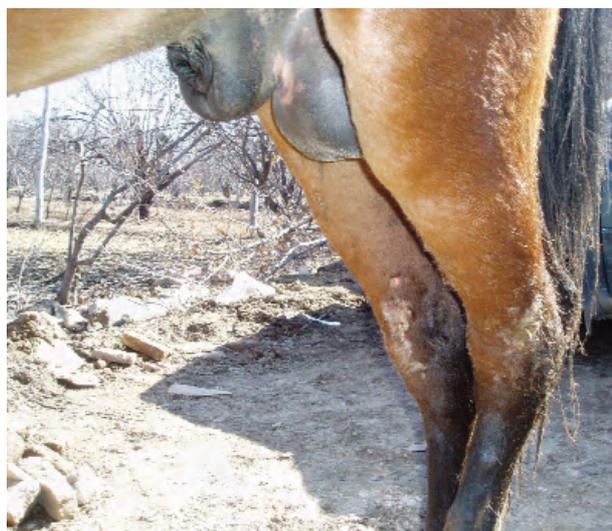


Figure 1. Lateral view; hock joints of the hind limbs showing lymphangitis and pyoderma (edema is prominent).



Figure 2. Post-sampling exudation from an intact abscess in the left side of neck (pus exposed during sampling).

for 3 days. The therapy was immediately successful, but the horse died 1 month later. It was not possible to perform a post-mortem examination since the animal had been sold to someone in another city, and so was not accessible. Therefore, the exact cause of death was not investigated.

Results and discussion

Samples were collected under strict sterile conditions from an intact abscess and were sent on ice to the bacteriological facility at the Department of Pathobiology, University of Tabriz. Samples were inoculated into enrichment media (tryptic soy broth) and positive cultures were subcultured after microscopic examination of the bacteria. Direct smears were also prepared from fresh samples for Gram staining. The presence of gram-positive cocci was confirmed and protocols were followed to identify the cause of the disease. Bacterial cultures followed by biochemical tests confirmed the presence of *Staphylococcus aureus*. Attempts to isolate other microorganisms were unsuccessful.

Etiological organisms of ulcerative lymphangitis in animals are *Corynebacterium pseudotuberculosis* (classical form), *Corynebacterium pyogenes*, *Corynebacterium equi* (rare), *Mannheimia haemolytica*, *Pseudomonas aeruginosa*, *Rhodococcus equi* (caused by *Strongyloides westeri* infection in foals), *Fusobacterium necrophorum*, *Streptococcus* spp. (rare), *Staphylococcus* spp., and *Actinobacillus equuli* (rare) (2,6-10). Mixed infection, soil-borne infection

(sporadic), or sterile abscesses have also been reported (2,6,8). Wound contamination and poor hygienic conditions in stables are predisposing factors to ulcerative lymphangitis (2,6,7). Sex, breed, or age has no significant effect on the prevalence of the disease (2,6). Ulcerative lymphangitis accounts for only 0.22% of the equine dermatoses seen at the Cornell University Clinic (6).

Lesions and abscesses on the hind limbs, especially on the fetlock joints, and extending to hock joints or the proximal part of these limbs have been reported in few cases of lymphangitis (9). In the present case, the lesions were seen on the skin of the hind limbs, chest, and neck. Normally, lesions are fluctuant/firm nodules, 5-7 cm in diameter and may discharge greenish exudates to the surface of the skin (6,9). Similar lesions are reported here. Single abscesses can resolve within 1 to 2 weeks; however, new abscesses may subsequently develop (6,9). In ulcerative lymphangitis due to *Corynebacterium pseudotuberculosis*, edema and fibrosis may cause lameness and deformity of the limbs (2,6,7). The spread of infection beyond skin lymph nodes is rare; actual lymphangitis is uncommon, with approximately 50% of abscesses occurring in the pectoral, ventral abdomen, auxiliary, and inguinal areas. These facts would indicate our case to be lymphangitis rather than pyoderma (6,9). Similar biotypes of *Corynebacterium pseudotuberculosis* (biotype 2) affects sheep, cattle, and horse (2,11), with variable nitrate reducing activity (6,11).

In the differential diagnosis of ulcerative lymphangitis, glanders, sporotrichosis, equine histoplasmosis, pythiosis, mycetoma, epizootic lymphangitis, and mycobacterial infections should be considered (2,6,7,9,12). The definitive diagnosis is based on the history, physical examination, cytology of impression smears from the skin abscess, and culture of the exudates. Biopsy of the skin lesions shows superficial to deep perivascular dermatitis or diffuse dermatitis (2,6,7). Pyoderma or pyogranulomatous dermatitis has also been reported, and edema or fibrosis may be present in ulcerative

lymphangitis (2,6,7). Gram or Brown and Brenn's staining is used to identify the presence of bacterial agents (7). In this report we isolated *Staphylococcus aureus*, which is not uncommon in ulcerative lymphangitis. Not only reported in abscesses but also present on the skin of affected horses, *Staphylococcus aureus* was reported by Devriese et al. (13) and Tabatabayi and Firouzi (14) along with *Staphylococcus intermedius* and *S. hyicus* (13-14). Bagcigil et al. (15) showed the risk of transmission of *Staphylococcus* spp. to humans from nasal discharges of animals such as horses, cattle, dogs, and pigs.

Local treatment of ulcers is a common and effective practice for only restricted lesions. However, parenteral injections of penicillin or tetracycline are necessary in severe cases (2). Fibrosis may reduce the chance of successful treatment (2,6,7,9,13). Hydrotherapy, exercise, surgical drainage, and using procaine penicillin G (20,000 to 80,000 IU/kg BW, bid, IM for 30 days or more, occasionally for 6 months) are recommended as well (6-8). Potassium penicillin (20,000 to 40,000 IU/kg, BW, IV qid) alone or in combination with sulfonamides (15 mg/kg, PO, bid) was also reported to be effective (10). Phenylbutazone and flunixin meglumine can reduce inflammation and pain (7,10), and improve the welfare of animals during therapy. We followed standard treatment protocols and the immediate response to the therapy (limiting skin wounds and improving the healing process) was as expected. Phenylbutazone was not used for more than 3 days. However, due to unknown causes the stallion died 1 month later. In this case a regular physical examination of the horse and post-mortem examination were not conducted. The initial respiratory disorder or any other cause (unknown to us) could have been responsible for death, as mortality in ulcerative lymphangitis is rare.

Control and preventive measures are important and include using disinfectants, improving hygienic conditions of the stables and beddings, quarantine and isolation of infected horses, fly control, and proper wound management (2,6,7,9,13).

References

1. White, S.D.: Equine bacterial and fungal diseases: A diagnostic and therapeutic update. Clin. Tech. Equine Pract., 2005; 4: 302-310.
2. Radostits, O.M., Gay, C.C., Hinchcliff, K.W., Constable, P.D. Veterinary Medicine. Saunders Co., Philadelphia. 2007; 798-800.

3. Weese, J.S., Caldwell, F., Willey, B.M., Kreiswirth, B.N., McGeer, A., Rousseau, J., Low, D.E.: An outbreak of methicillin-resistant *Staphylococcus aureus* skin infections resulting from horse to human transmission in a veterinary hospital. *Vet. Microbiol.*, 2006; 114: 160-164.
4. Leonard, F.C., Markey, B.K.: Methicillin-resistant *Staphylococcus aureus* in animals: a review. *Vet. J.*, 2008; 175: 27-36.
5. Hall, K., McCluskey, B.J., Cunningham, W.: *Corynebacterium pseudotuberculosis* infections (Pigeon Fever) in horses in Western Colorado: an epidemiological investigation. *J. Equine Vet. Sci.*, 2001; 21: 284-286.
6. Scott, D.W., Miller, W. H.: *Equine Dermatology*. W.B. Saunders Co., St. Louis. 2003; 90 and 227-232.
7. Scott, D.W. *Large Animal Dermatology*, 1st edn., W. B. Saunders Co., Philadelphia. 1988; 120-121 and 133-134.
8. Brown, C.M., Bertone J. *The 5- minute veterinary consult equine*. 1st edn., A Wolters Kluwer Co., Philadelphia. 2002; 288-289.
9. Smith, B.P. *Large Animal Internal Medicine*. 3rd edn., Mosby, Inc., Missouri. 2002; 183.
10. Rose, R.J., Hodgson, D.R. *Manual of Equine Practice*, 2nd edn., W. B. Saunders Co., Philadelphia. 2000; 497-498.
11. Costa, L.R.R., Spier, S.J., Hirsh, D.C.: Comparative molecular characterization of *Corynebacterium pseudotuberculosis* of different origin. *Vet. Microbiol.*, 1998; 62: 135-143.
12. Nadalian, M.Gh., Dalir Naghadeh, B., Khosravi, A.: The first report of *sporothricosis* in horse around Tehran. *J. Fac. Vet. Med. Univ Tehran*. 1997; 51: 92-95.
13. Devriese, L.A., Nzuambe, D., Godard, C.: Identification and characteristics of staphylococci isolated from lesions and normal skin of horses. *Vet. Microbiol.*, 1985; 10: 269-277.
14. Tabatabayi, A.H., Firouzi, R. *Disease of Animals due to Bacteria*. The University of Tehran press., Tehran. 2001; 8-9.
15. Bagcigil, F.A., Moodley, A., Baptiste, K.E., Jensen V.F., Guardabassi L.: Occurrence, species distribution, antimicrobial resistance and clonality of methicillin- and erythromycin-resistant staphylococci in the nasal cavity of domestic animals. *Vet. Microbiol.*, 2007; 121: 307-315.