



Ulcerative Lymphangitis in a 12 Year Old Stallion in Ibadan, Nigeria A Case Study

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ABSTRACT

Ulcerative lymphangitis, a bacterial infection primarily caused by *Corynebacterium pseudotuberculosis* is an important infectious disease of horses and ruminants affecting the cutaneous lymphatic vessels. Differential diagnosis of ulcerative lymphangitis include epizootic lymphangitis, a fungal infection, sporotrichosis caused by *Sporothrix schenckii*, pyoderma, and glanders. The aim of this study is to describe the successful management protocol of ulcerative lymphangitis in a stallion in Ibadan, Nigeria. A 12 year old Arewa stallion was presented in December 2019 with cutaneous lesions, ulcerated wounds, anorexia, and weight loss. The lesions were present around the limbs, chest, facial and abdominal regions. Based on case history, the client previously had a mare presenting similar conditions, and decided to manage the mare according to his knowledge. Due to the unresponsiveness of the mare to the protocol incorporated by the client, resulted in the death of the mare. Furthermore, the client reported that three months earlier, the stallion had previously been managed for cutaneous myiasis with forceful expulsion of worms from the skin and the administration of ivermectin. Based on clinical and laboratory examinations, the case was diagnosed as ulcerative lymphangitis. Therapeutic management protocol includes the use of levofloxacin, an antibiotic of the fluoroquinolone drug class, diclofenac, tetanus antitoxin, and supportive therapy. The management protocol proved successful, with the stallion recovering 3 weeks posttreatment.

Case study:

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INTRODUCTION

Ulcerative lymphangitis also known as “pigeon fever or dry land distemper” (Spier, 2006) is an important infectious disease of horses affecting the cutaneous lymphatic vessels. Several bacterial pathogens, including *Corynebacterium pseudotuberculosis*, *C. equi*, *Mannheimia haemolytica*, *C. pyogenes*, *Streptococcus spp*, *Pseudomonas aeruginosa*, and *Fusobacterium necrophorum*, and fungi agents such as *Aspergillus fumigatus*, *Aspergillus niger*, *Mucor spp.*, and *Trichophyton spp.*, have been linked as the disease's causal organism (Zavoshti *et al.* 2009, Mamman *et al.* 2011). However, it is reported to be primarily caused by *Corynebacterium pseudotuberculosis*, a Gram positive, pleomorphic rod-shaped, and facultative anaerobic bacteria organism (Sandy and Tim, 2012). This bacterium has been identified as the causative agent of the classical type of

the disease, with other isolated organisms very occasionally related with clinical manifestation. Transmission is mostly through skin abrasions and mucous membranes, mainly from infected soil and insects, particularly flies, which plays essential role as mechanical vectors (Valentine and McGavin, 2007).

Ulcerative lymphangitis manifest as a chronic condition that progress from small skin nodules, fever and in appetite, to broad big nodules with external abscessation, internal abscessation, and ulcerative lymphangitis (Sandy and Tim, 2012). If not promptly addressed as reported by Radostits *et al.* (2007), the disease disrupts the performance of the affected horse resulting in lameness and limb deformity. Tentatively, diagnosis can be obtained with the history, clinical presentation, and physical examination while a definitive diagnosis can be confirmed using culture exudates or cytology of skin abscess impression smears

(Radostits *et al.* 2007). The most common management protocol for ulcerative lymphangitis is the combination of antibiotics, anti-inflammatory drugs, hydrotherapy, and, in some cases, surgical drainage and local skin ulcer treatment (Scott and Miller, 2003). In general, antimicrobials are indicated for the three reported forms with rifampin co-administered with ceftiofur, a third generation cephalosporin (β -lactam) proven to be effective against internal abscesses while trimethoprim-sulfa or procaine penicillin together with creating a drainage line are reported as treatment against external abscesses (Sandy and Tim, 2012).

Ulcerative lymphangitis is said to be zoonotic in nature with possible development of lymphadenitis and pneumonia in humans (Wilson, 2012). In Nigeria, there are few reports about ulcerative lymphangitis in horses which happens to be a disastrous disease limiting performance of horses (Addo 1980, Adeyefa 1983, Useh *et al.* 2005, Mamman *et al.* 2011) but further reported to be more common in the Northern region considering the high population of horses and adverse climatic conditions when compared to the Southern part of the country (Mshelia *et al.* 2010, Mamman *et al.* 2011).

Case History

A 12 year old Arewa stallion within the suburbs of Ibadan, Southwestern region of Nigeria was presented in December 2019 with nodular lesions, deep ulcerated wounds, anorexia, and weight loss. History further revealed that the client previously had a mare that recently died with similar clinical presentations. Three months earlier, the stallion had previously been managed for cutaneous myiasis with forceful expulsion of worms from the skin and the administration of ivermectin.

Clinical Findings

Physical examination revealed lesions as seen in Fig. 1, purulent discharge with a pungent odor from cutaneous abscesses, slightly dehydrated, and palpable ribs. Rectal temperature was 40 °C indicating pyrexia, heart rate (40 beats/minute) and respiratory rate (14 cycles/minute). Further investigation revealed that the stallion had no stable, poor quality feed, and the presence of stable flies alongside house flies (*Musca domestica*) was noticed around the surroundings.

Sample Collection

After the stallion had been properly restrained by the handler, blood sample was aseptically collected using a 10 ml syringe which was divided into a 5 ml anticoagulated sample bottle and another 5 ml plain sample bottle. Swab stick was deeply inserted into selected ulcerative lesion for microbial analysis. The samples were sent to the laboratory in ice-packed container.

Laboratory Findings

The hemogram as shown in table (1), present anemia, lymphopenia, and leucopenia.

Table 1: Complete blood Count (CBC) representation of the Stallion.

Parameter	Value	Unit
Hemoglobin Concentration (Hb)	9.2	g/dl
Packed Cell Volume (PCV)	27	%
Red Blood Cell Count (RBC)	4.22	$\times 10^6/\mu\text{l}$
Mean Corpuscular Volume (MCV)	63	fl
Mean Corpuscular Hemoglobin Concentration (MCHC)	34	g/dl
Platelets	92000	μl
Total White Blood Cell Count (TWBC)	5850	μl
Lymphocytes	13	%
Segmented Neutrophils	71	%
Band Neutrophils	2	%
Eosinophils	10	%
Monocytes	4	%
Basophils	0	%
Total protein	7.7	g/dl
Fibrinogen	200	mg/dl

Culture and Sensitivity Test

On blood agar, mixed growth of α -hemolytic isolates *Corynebacterium spp* alongside *Streptococcus spp* and *Staphylococcus aureus* was discovered. Impression smears from abscesses revealed non-motile Gram positive pleomorphic rods with few cocci. On biochemical test, the isolate was catalase positive, oxidase positive, and nitrate negative. The antibiotic sensitivity test reported all isolates to be commonly sensitive to ciprofloxacin 10 μg and tarivid 10 μg .

Treatment

Administration of levofloxacin (500 mg, IV, q24h) for 5 days, diclofenac (25 mg, IM, q24h) for 3 days, vitamin C (50 mg/kg bwt, IM, q24h) for 7 days, vitamin B complex (7.2 mg/kg bwt, IM, q24h) for 4 days, 0.9% sodium chloride solution IV and 10% dextrose IV (2 L each for 5 days), charmil[®] skin gel (active ingredients – *Cedrus deodara* oil and *Pongamia glabra* oil) application once daily till wounds dries off. Tetanus antitoxin (3000 IU, SC) and tetanus toxoid (1

ml, IM) were administered via both side of the neck with the toxoid booster scheduled for eight weeks after the initial dose. Re-examination of the stallion on day 2 post-treatment revealed that the stallion responded to the treatment regimen with drying up of some cutaneous lesions and appetite restored. On day 21 post-treatment, there was no evidence of skin lesions around the body and the weight appreciated as seen in Fig. 2.



Fig. 1(left-right): nodular and ulcerative lesions around the chest, face, and limbs.



Fig. 2: stallion after full recovery

DISCUSSION

Ulcerative lymphangitis remains an endemic infection in horses in Nigeria with few reported cases. *Corynebacterium pseudotuberculosis*, *Staphylococcus aureus*, *Streptococcus spp*, *Pseudomonas aeruginosa*, *Rhodococcus equi* have all been incriminated as etiological agents of ulcerative lymphangitis (Smith 2002, Radostits *et al.*, 2007, Mamman *et al.*, 2011).

The present study confirmed *Corynebacterium pseudotuberculosis*, alongside with *Streptococcus spp*, and *Staphylococcus aureus*, as the etiological agent for ulcerative lymphangitis which was similar to the findings by Mamman *et al.*, (2011) in Nigeria. The hematological parameters revealed anemia, moderate lymphopenia, leucopenia, which was in agreement with the findings by AL-Mubarak *et al.*, (2013). This occurred as a result of the multiple lesions, hemorrhage, stress, and bacteria load encountered.

Fluoroquinolone selection as the antimicrobial drug of choice in this study supports the findings reported by Mamman *et al.*, (2011) who revealed that fluoroquinolones or penicillins can be used to produce favorable results when there is no opportunity to carry out drug sensitivity test. Levofloxacin was the drug of choice used due to the fact that it has increased bactericidal effect on Gram positive bacteria when compared to ciprofloxacin (Odenholt *et al.*, 1997) and its pharmacokinetic data gives room to be administered once daily (Djabarouti *et al.*, 2004). Vitamin B complex was administered as hematinics to enhance hemopoiesis. Tetanus antitoxin and tetanus toxoid were administered to prevent short and long term tetanus to which equine species are highly susceptible. Tetanus antitoxin 3000 IU was administered based on the fact that the presented lesions were stale. On the sixth day, fluid therapy was discontinued due to the fact that the stallion was observed to be feeding about 70% of the normal feed ration.

Considering the environment with the absence of a stable, the stallion was bound to roam freely increasing the possibility of mixed infection as further reported by Radostits *et al.*, (2007). The wound sites noticed during physical examination would have been points of entry for the causative organism. This supports documented findings by Pratt *et al.*, (2005) and Radostits *et al.*, (2007) that the point of entry for the organism can be considered to be via abrasions or skin breakage, but further research by Valentine and McGavin (2007) proved that the organism can directly enter the skeletal muscle through open wounds. Alongside the soil which could be a habitat for the organism (Spier *et al.*, 2012), there is high probability that stable and house flies can be a source of transmission due to their numerous population

discovered during the first farm visit which also support the findings reported by Pratt *et al.*, (2005), Radostits *et al.*, (2007), and Spier *et al.*, (2012) that insects such as *Haematobia irritans*, *Musca domestica* and *Stomoxys calcitrans*, etc., serves as vectors for disease transmission. Delay in disease reporting could result in the unresponsiveness of antimicrobials especially when at the chronic stage (Singathia *et al.*, 2011; Spier 2019).

CONCLUSION

This study further proves *Corynebacterium pseudotuberculosis* as the major etiological agent of ulcerative lymphangitis, and the fluoroquinolone class of antimicrobial as drug of choice. Also, prompt reporting of cases for early diagnosis is strictly advised. The client was further advised on the importance of fly control, provision of stables with improved hygienic conditions, timely vaccination, and strict biosecurity for disease prevention.

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Conflicts of interest

The authors acknowledge that there is no conflict of interest regarding the research data and tools used with this study.

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