

CASE REPORT

Food/Farmed Animals

Foot lesion in a male Boer goat associated with caprine digital dermatitis

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Email: mostafa1955ug@yahoo.com**Abstract**

A case of interdigital hyperplasia and digital dermatitis on the dorsal aspect of the right hind digit in an adult male Boer goat was described. The digital dermatitis was complicated by granular ulceration of the skin on the dorsal aspect of the foot. Histologically, the lesion was characterised by the presence of numerous papillae-like growths in the epidermis. Some papillae had mononuclear inflammatory cells. A number of papillae-like growths hardly had any cells in the core; however, a few plasma cells and lymphocytes were present. The goat was moderately lame on the affected limb. The lesion was excised surgically and healed without any complication. Surgical excision proved to be uneventful healing.

BACKGROUND

A Boer goat was introduced in Uganda for crossbreeding with the local breeds of goats for increasing meat production and raising the household income of smallholder farmers. Foot lameness is a serious disease in dairy livestock because of decreased milk production and fertility and increased risk of culling.¹ Lameness in goat has been identified as a common welfare problem.² The diseases causing lameness in goat are less well described than in cattle and sheep.^{3,4} Foot lameness was observed in 15% of the goats showing foot lesions and 24% of the goats without foot lesions. Claw cracks, erosions on the horn of the bulbs and interdigital dermatitis have been reported in goats.⁵ The clinical signs and pathology of contagious ovine digital dermatitis (CODD) with severe lameness have been described in both sheep and goats.^{4,6,7} Foot disorders recognised in goats are similar to those described in sheep.³ The described clinical symptoms of the disease in the United Kingdom are varied with no distinct clinical pattern. Some lesions included the coronary band and hoof wall⁴ and some cases involved the sole.⁷ To our knowledge, there are no reports of the condition occurring in Uganda. Therefore, this report will describe clinical and histopathological features associated with clinical foot lesions of digital dermatitis in a male Boer goat and its surgical treatment.

CASE PRESENTATION

A 5-year-old male breeding goat was referred to the surgery clinic, Faculty of Veterinary Medicine, Makerere University for chronic ulcerating and granulating wound of 3 months duration in its right hind foot (Figure 1a). Clinical examination revealed a large, chronic granulating wound cover-

ing the dorsal aspect of the right hind digits. It extended from the skin of the interdigital skin to the skin overlying the first interphalangeal joint, and over the dorsomedial and dorsolateral aspects of the medial and lateral digits, respectively.

The skin around the margins of the wound was thickened and raised. Most of the wound surface was covered by dried scab, but in some areas, the scab had peeled off leaving a bleeding, raw surface. There was a growth of the skin in the interdigital space with grossly resembled interdigital skin hyperplasia seen in cattle. The skin growth was attached to the axial aspect of the lateral claw resulting in a widening of the space between the medial and lateral claws. The goat walked with moderately lame, uneven steps and shortened stride. The owner decided to treat the lesion surgically. Verbal informed owner consent was obtained.

INVESTIGATIONS

Histopathological findings revealed the lesion mostly involved the epidermal layer of the skin. A thick cornified (keratinised) layer covered the outer portion of the affected area. Numerous papillae-like growths were seen (Figure 1b). Some papillae had mononuclear inflammatory cells. The papillae-like growth was covered with a thick layer of keratin and showed inflammatory cells and a thin layer of stratified squamous epithelium (Figure 1c). Some papillae-like growths hardly had any cells in the core. The core appeared evacuated (Figure 1d). However, a few plasma cells and lymphocytes were present. Some papillae neither had cells in the core nor epithelial layer suggesting necrosis. The interpapillary spaces were filled with cornified and fibrinous material.

The subcutis demonstrated a marked presence of granulation tissue dominated by fibrocytes.

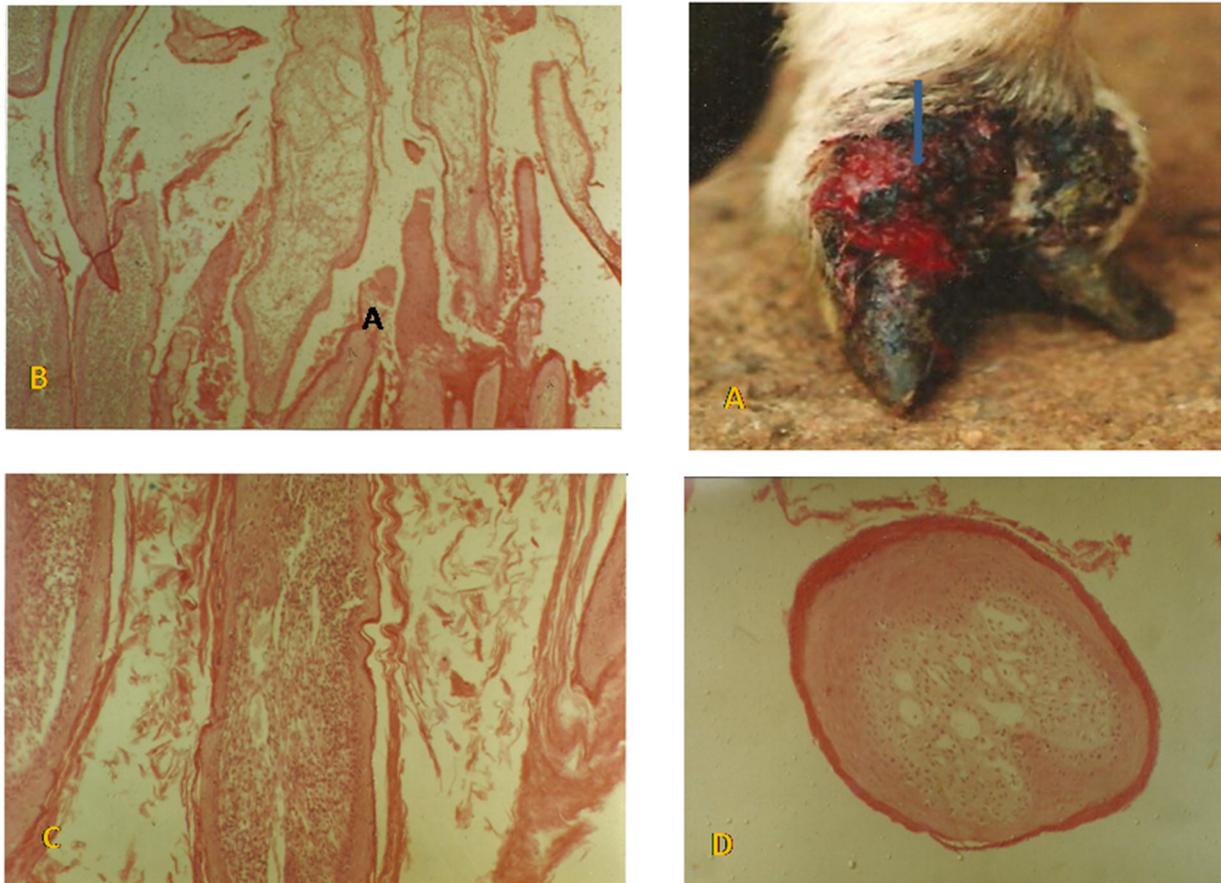


FIGURE 1 (a) A 5-year-old male Boer goat with digital dermatitis in right hind limb with overgrowth, ulceration, necrosis in the Interdigital space and coronet with marked hyperkeratosis. (b) A 5-year-old male Boer goat with digital dermatitis showing free surface of the skin. Many papillary growth (A). A thick layer of keratin covers the papillae like growths (X- 40). (c) A 5-year-old male Boer goat with digital dermatitis showing papillae like growths. Thick layer of keratin was seen. One papillae (center) showing inflammatory cells and thin layer of stratified squamous epithelium (X- 100). (d) A 5-year-old male Boer goat with digital dermatitis. Cross section of the papillae like growth. Thick layer of keratin with Many epithelial cells appeared necrotic. The core of the growth is evacuated (X- 250)

SURGICAL TREATMENT

Surgical treatment was carried under the effect of total intravenous general anaesthesia using Xylazine 0.1 mg/kg (ADWIA Co. SAE, Egypt) and ketamine hydrochloride (Sigma-tec Pharmaceutical Industries, SAE, Egypt) 5 mg/kg given intravenously.⁸ The general anaesthesia was supplemented by subcutaneous infiltration of 5 ml 2% solution of lignocaine hydrochloride (ASTRA Sodertl äje, Sweden) in a ring block just distal to the fetlock joint. The lesion was carefully excised surgically under aseptic conditions. Haemorrhage was controlled using a tourniquet applied around the limb just proximal to the fetlock. The skin incision was closed with Vetafil suture material using a simple interrupted pattern.

OUTCOME AND FOLLOW-UP

The foot was bandaged and penicillin-streptomycin antibiotic injection was given intramuscularly for 3 successive days. The excised lesion was placed in 10% neutral buffered formalin, and then sectioned into 5-mm slices and stained with haematoxylin and eosin (HE). The wound healed without any complication or recurrence within 6 months postsurgically.

LEARNING POINTS/TAKE HOME MESSAGES

- Keeping the animal under dry hygienic environment.
- Annual routine foot trimming.
- Regular observation of goats for early recognition of lameness.

DISCUSSION

The diseases causing lameness in goats are less well described than in cattle and sheep.^{1,4} Recently, clinical, radiographic, histopathology and immunohistochemistry in CODD have been described in sheep and goats.^{4,6,7} Foot disorders recognised in goats are similar to those described in sheep.³ Previously described CODD lesion was started with hair loss erosion/ulceration of the skin at the coronary band with partial under-running of the hoof horn with purulent and visible laminae in sheep.⁴ Similarly, the typical clinical picture is evidenced here in a Boer goat similar to sheep, but without purulent and visible laminae.

In this respect, recent study in dairy goats reported severe and mild lesions were started with solar ulceration and granulation tissues with or without hyperkeratosis and gross enlargement of the foot.⁷ These findings were contradicted with Boer goat in the present study. Moreover, bovine digital dermatitis (BDD) and CODD have been hypothesised to be the same disease.⁹ Therefore, the finding in the present study coincides with dairy cattle BDD identified by erosive/ulcerative, granulating, and proliferative or papilliform-like features¹⁰ (Sibley, 2013). Furthermore, sometimes BDD lesions involve the interdigital skin or the skin of interdigital hyperplasia.^{11,12}

Therefore, based on the clinical features and location of the lesion seen in the present study in both sheep and cattle suggested that the case under study is one of digital dermatitis in a Boer goat.

The aetiopathogenesis of the high frequency of lameness and digital diseases in goats were attributed to the moist and humid environment,¹³ bacterial particularly spirochetes detected in histological sections of the affected skin have been reported.¹¹ Recently, the immunohistochemistry and histopathological tissue sections have been used to identify *Treponema*-like organisms and were associated with hair follicles and sebaceous glands in BDD.¹⁴ Similarly, large numbers of *Treponema*-like organisms were observed in histopathological and immunohistochemistry tissue sections in sheep and goats CODD.^{6,7} In the current study, it was not possible to establish the cause of the lesion encountered in this 5-year Boer goat.

Previously reported histopathological changes in the superficial layers of the epidermis in bovines included hyperkeratosis, parakeratosis, hyperparakeratosis as well as erosion of the stratum corneum and lucidum, and perivascular infiltration of neutrophils, eosinophils, basophils, plasma cells, macrophages and others. The deeper layers showed acanthosis, swelling and ballooning degeneration of the cells of the stratum spinosa, as well as microabscesses were also seen in this area.^{12,15}

Proliferative and inflammatory reactions have been frequently observed in the dermis, especially the dermal papillae, which may become numerous and extend to the surface, sometimes being separated by parakeratotic cells.¹⁵ Furthermore, the reported CODD in sheep on the superficial layers exhibited mild to moderate epidermal hyperplasia, parakeratotic hyperkeratosis, haemorrhage and infiltration of neutrophils. There was a complete loss of the superficial cornified layer (horn) and replacement by a band of degenerated neutrophils, fibrin, necrotic debris and haemorrhage. The epidermal laminae were markedly infiltrated by the suppurative inflammatory process, which extended into the dermal laminae.⁶

Accordingly, the observed histopathological features in the present study with the proliferation of dermal papillae and keratinisation were the most prominent features and consistent with the findings in cattle and sheep. However, the degree of inflammatory reaction was less marked than those observed in earlier reports of digital dermatitis in cattle and sheep. However, the scarcity of cells in the papillae is thought to be due to the presence of extensive necrosis.

Early treatment of BDD recommended topical application of oxytetracycline antibiotics in the form of spray or

footbath.¹¹ Recently, a significant effect of systemic amoxicillin antibiotics combined with foottrim and chlortetracycline footbath significantly improved recovery rate and reduced the risk of developing further infection.² In BDD with proliferative forms or neglected complicated cases, surgical excision was advised.¹¹ Subsequently, in the present study surgical excision of the lesion was effective and provided uneventful healing without recurrence or other complication within 6 months postsurgically.

In conclusion, an unusual case of digital dermatitis involved a male Boer goat was described. Some features of the disease mentioned in cattle, sheep and dairy goats were not seen. However, based on the location of the lesion, some histopathological features particularly the presence of numerous papillae and the polymorphic nature of the disease might suggest that the case under study is one of digital dermatitis. More cases of the disorder in Boer goats need to be studied to strengthen this suggestion.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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