

Bilateral Carpal Hygroma in a 2-Month-Old Dorper Lamb Ram

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Abstract

This case report aimed to treat a bilateral hygroma in a 2-month-old Dorper lamb ram in a flock of sheep at Rafin Guza, Kaduna North Local Government Area, Nigeria. The flock comprised twenty Dorper sheep (18 ewes and 2 rams) with a history of swollen joints in one lamb ram, there was a history of medication with de-wormer (Albendazole), Injection Tylosine, and Injection of 20 % Oxytetracycline in the flock. Physical examination on the farm visit showed an apparently healthy flock except for the lamb with carpal hygroma. The lamb ram weighed 20 kg with a slightly pale mucous membrane, unilateral enlarged pre-scapular lymph nodes, and bilateral carpal hygroma. Vital parameters like temperature, pulse, and respiratory rate were 38.2°C, 60 beats/min, and 17 cycles/min, respectively, which was within the normal range. Bacteriological and serological tests were carried out using the blood and hygroma fluid samples collected aseptically from the lamb ram. The result showed the lamb had leukocytosis and neutrophilia on hematology, the serum sample was positive for Rose Bengal Plate Test (RBPT) and the culture showed positive for *Brucella* spp. Hence, there is a need for proper surveillance in the study area because of the public health and economic threat that can be posed by *Brucella* spp found on the farm.

Keywords:

Brucellosis, Dorper, Hygroma, Kaduna.

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Introduction

Brucellosis is a zoonotic disease caused by a gram-negative bacterium of the genus *Brucella* (Ducrotoy et al., 2017; Qureshi et al., 2023). The disease has a worldwide distribution and affects economically important domestic livestock as well as a wide range of wild mammals (Craighead et al., 2018). According to Dadar et al., (2021), the species that have the biggest effects on domestic livestock productivity and human health are *B. abortus*, *B. melitensis*, and *B. suis*. Moreover, cross-infections may be important in mixed husbandry systems or at the livestock-wildlife interface, even though they primarily infect cattle, small ruminants, and pigs, respectively (Dadar et al., 2021). Those in charge of health systems rarely give brucellosis top priority and the World Health Organization (WHO) lists it as one of the seven endemic zoonoses that are often neglected (Saxena and Saxena, 2018). Brucellosis causes considerable losses through abortion, infertility, neonatal death, reduced milk yield, dystocia, and uterine prolapse (Ebid et al., 2020). In small ruminants (sheep and goats), it has been reported in northern Nigeria with carpal hygroma fluid is serologically positive for brucellosis (Onoja et al., 2008). Despite underreporting and the scarcity of epidemiologically valid data, the evidence obtained throughout the years shows that brucellosis is a widespread problem in Africa (Ducrotoy et al., 2017). Diagnosis of brucellosis is conducted directly (bacteriological and molecular methods) and indirectly (*in vitro* serological methods and allergic methods *in vivo*) (Khoshnood et al., 2022).

Case Details

History, clinical examination, and sample collection

A 2-months-old dorper lamb weighing 20 kg was presented to the ambulatory unit of Magajin Veterinary Clinic, Department of Veterinary Services, Ministry of Agriculture, Kaduna State, Nigeria, with the complaint of swollen joints (Fig. 1) and inappetence.



Fig. 1. Bilateral carpal hygroma (arrow).

The lamb was semi-intensively managed in a flock of twenty Dorper sheep. The temperature (38.2°C), pulse rate (60 beats per minute), and respiratory rate (17 cycles per minute) were within the normal range (Hassan and Hassan, 2003). The mucous membrane was slightly pale, and the pre-scapula lymph nodes were enlarged unilaterally on palpation. Blood was collected from the jugular vein for a complete blood count and the values obtained were compared with the reference laboratory values documented by Radostits et al., (2006). The carpal joint was shaved

and cleaned properly using chlorhexidine and the entire content was aseptically drained using a hypodermic needle and syringe which was then subjected to bacterial culture, and an antimicrobial susceptibility test. The serum was subjected to the Rose Bengal Plate Test (RBPT) with *B. abortus* polyvalent antigen. The procedure was as described previously by Alton et al., (1988). The hygroma fluid samples were cultured in

Farrell’s medium and following the growth in this primary medium, the observed colonies were cultured diphasically into both *Brucella* agar and Serum Dextrose Agar (SDA) plates and incubated at 37°C in 10% carbon dioxide for four days.

Laboratory Result

The hematological parameters showed leukocytosis and neutrophilia (Table 1).

Table 1. Hematology result showing blood parameters.

Parameters	Result	Reference Values (Njidda et al., 2014)	Inference
PCV (%)	31	27-45	Normal
Hb (g/dL)	12	9-15	Normal
RBC (X 10 ⁶ /μL)	14.3	9-15	Normal
MCV (fl)	32	28-40	Normal
MCH (pg)	8.7	8-12	Normal
MCHC (g/dL)	31.3	31-34	Normal
Platelets (μL)	810	800-1100	Normal
Total WBCs (X 10 ⁶ /μL)	10.4	4-8	Leukocytosis
Neutrophils (X 10 ⁹ /L)	56	10-50	Neutrophilia
Lymphocytes (X 10 ⁹ /L)	53	40-55	Normal
Monocytes (X 10 ⁹ /L)	2	0-6	Normal
Eosinophils (X 10 ⁹ /L)	0	0-10	Normal

Based on the antimicrobial susceptibility test, *Brucella spp* was sensitive to gentamicin and doxycycline but resistant to ciprofloxacin, erythromycin, and chloramphenicol (Fig. 2). The RBPT showed a positive result for *Brucella* (Fig. 3).

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Diagnostic Report Form

Date/Time of Collection: 03/04/24
 Date of submission: 03/04/24
 Veterinarian: _____ Necropsy/Clinic No: _____
 Clinician/Address: _____
 Owner's Name/Address: _____
 Species: OXIDE
 Breed: ASPICER Age: 7 MONTH
 Sex: M Color: _____
 REQUEST: Routine Service: _____ Research: _____
 Examination Required: Culture:
 Serology:
 Smear/Slide: _____
 Gram stain:
 PCR test: _____
 Other: _____

RESULTS

Amoxicillin Vancomycin Ciprofloxacin CO-13 sulphate Erythromycin Azithromycin Chloramphenicol	Sensitive Doxycycline Gentamicin
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Fig. 2. Diagnostic report form showing required bacteriological examination and antimicrobial sensitivity.

Treatment and Outcome

Injection of dexamethasone (2 mg/kg stat., Range Pharma, Bangladesh), furosemide (3 mg/kg stat., Baxter Healthcare, USA) was intramuscularly administered once while tetracycline (20 mg/kg Kepro®, Netherland) was every other day for two weeks. The lamb recovered and the hygroma completely healed (Fig. 4). A farm visit and careful examination of the flock was carried out as a follow-up to the case. There was no history of abortion or infertility in the flock and vital parameters for the flock were within the normal range, indicating a healthy flock.

Discussion

There was a significant increase in the leucocyte and neutrophil counts of the lamb on hematological examination. Sheep with carpal hygroma may experience stress and compromised immunity due to pain and discomfort (Prajapati and Chauhan, 2024). The carpal hygroma in this study was due to *Brucella* infection and the body's immune system responds by increasing white blood cell production, leading to leukocytosis. Neutrophilia specifically occurs because neutrophils are key players in the body's defense against microorganisms, hence, they migrate to the site of infection and work to eliminate the invading bacteria (Teng et al., 2017).

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Diagnostic Report Form

Date/Time of Collection: 3/4/24
 Date of Submission: 03/04/24
 VPH NO: _____ Necropsy/Clinic NO. _____
 Clinician /Address: _____
 Owner's Name/Address: _____
 Species: Ovis
 Breed: Dorper Age: Adult
 Sex: M Color: White
 Request: Routine Service: _____ Research: _____
 Examination Required: Culture: _____
 Sensitivity: _____ Serology: RBPT (+)
 Special Stain: _____
 Brucellosis test: RBPT (+)
 Rabies test: _____
 Others: _____

Results
 Positive for RBPT (+)

Dept. of Vet. Public Health & Preventive Medicine
 Faculty of Veterinary Medicine
 Ahmadu Bello University, Zaria.

Fig. 3. Serological analysis result using Rose Bengal Plate test.



Fig. 4. Improvement in the condition of the ram following treatment.

The hygroma fluid was cultured in *Brucella* agar and results showed positive for *Brucella spp* Since no history of vaccination and a positive result from RBPT and culture indicates a serious health risk to other sheep within the flock as well as the attendants on the farm since

brucellosis is a zoonotic disease that has a public health significance (Qureshi et al., 2023). The results agree with Onoja et al., (2008) who stated the presence of active infection of brucellosis in Zaria. Kaduna and Zaria towns have similar environmental conditions that will enhance the survivability of the *Brucella*, hence, a need for a more robust epidemiological investigation to determine the status of brucellosis in Kaduna State, Nigeria. The treatment also confirms the effectiveness of 20 % oxytetracycline at a dose rate of 20mg/kg, every other day for 2 weeks in the treatment of brucellosis in sheep, though molecular analysis is suggested.

Conclusion

This case report indicates the presence of *Brucella spp* both through RBPT and culture from the lamb in the flock studied. There is a need for the government to establish a nationwide control program for brucellosis in animals to mitigate its spread because of its public health significance and the zoonotic risks that clinicians and in-contact personnel are exposed to in brucellosis-infected flocks. It also poses a serious economic threat to the survival and sustainability of the food chain.

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