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Research Article

Concurrent Hepatic and Pulmonary Fasciolosis in a White Fulani Cow: A Case Report Highlighting Food Safety and Economic Implications

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ABSTRACT

Fasciolosis, caused by liver flukes of the genus *Fasciola*, remains a globally significant parasitic disease of ruminants, with annual economic losses exceeding US$3.2 billion due to decreased productivity and organ condemnation. We report a rare case of concurrent hepatic and pulmonary fasciolosis in a 400 kg White Fulani cow that resulted in condemnation of both the liver and lungs at postmortem inspection. Clinically, the animal presented with respiratory distress, jaundice, dehydration, weight loss, and emaciation. Fecal examination revealed operculated *Fasciola* eggs, while necropsy demonstrated severe hepatic fibrosis, necrotic tracts, pipe-stem lesions, and adult flukes, alongside pulmonary congestion, necrotic foci, and adhesions consistent with ectopic migration. This case emphasizes the parasitological and pathological significance of fasciolosis, its contribution to economic losses in the cattle industry, and the zoonotic risk to humans. The report highlights the necessity of integrated control strategies, including regular anthelmintic treatment, improved animal husbandry, snail control, and strengthened abattoir surveillance to safeguard both livestock health and food safety.

Keywords: Cattle; Ectopic migration; Fasciolosis; Food safety; Organ condemnation

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INTRODUCTION

Fasciolosis is a neglected foodborne parasitic disease caused by trematodes of the genus *Fasciola*, notably *F. gigantica* and *F. hepatica* (Hayward *et al*., 2021; Saijuntha *et al*., 2021). Globally, fasciolosis is responsible for economic losses exceeding US$3.2 billion annually due to reduced meat and milk yield, impaired fertility, and organ condemnation (Flores-Velázquez *et al*., 2023). The World Health Organization (WHO) has classified fasciolosis as a neglected tropical disease, with over 2.4 million people infected worldwide and nearly 180 million at risk. Human fasciolosis is increasingly reported, reinforcing it's One Health significance (Opio *et al*., 2021; Abaya *et al*., 2023).

Fasciola have a complex life cycle involving freshwater snails (*Radix natalensis*, *Galba truncatula*) as intermediate hosts. Their distribution and transmission are strongly influenced by rainfall, flooding, and ecological conditions (Nyagura *et al*., 2022; Modabbernia *et al*., 2024). Following ingestion of metacercariae, immature flukes migrate from the intestine to the liver, establishing in the bile ducts and causing chronic hepatopathy (Lalor *et al*., 2021). Beyond hepatic damage, the ectopic migration of immature

flukes to extrahepatic organs such as the lungs and brain has been reported but remains uncommon (Weinstock & Leung, 2022; Nukeri *et al*., 2022).

In Nigeria and other African countries, fasciolosis remains endemic, exacerbated by poor animal husbandry, limited veterinary services, lack of routine deworming, and informal slaughter practices that bypass meat inspection (Ahmad *et al*., 2020; Banwo *et al.,* 2023; Yuguda *et al*., 2024). This case report documents concurrent hepatic and pulmonary fasciolosis in a White Fulani cow, highlighting the parasitological significance, economic losses, and public health risks.

CASE PRESENTATION

A 400 kg adult female White Fulani cow was presented for clinical evaluation with a history of progressive respiratory difficulty, coughing, anorexia, and inability to graze despite being offered hay and maize bran.

On physical examination, the animal showed dyspnoea, jaundiced mucous membranes, marked dehydration, severe weight loss, and poor body condition. Blood and faecal samples were collected. Haemoparasites were not detected on blood smears, while faecal flotation revealed numerous operculated eggs (Plate 1) morphologically consistent with *Fasciola* spp.

Due to financial limitations, the owner opted for slaughter instead of prolonged treatment.

POSTMORTEM FINDINGS

Gross examination of the liver revealed extensive pathological changes, including migratory tracts filled with necrotic debris, fibrotic lesions, calcification, and adult *Fasciola* flukes embedded in the parenchyma (Plate 2). The bile ducts were markedly dilated, with characteristic “pipe-stem” fibrosis. On incision, the hepatic tissue appeared gritty and discoloured (Plate 3). The lungs showed significant lesions, including congestion, whitish necrotic foci, firm consolidated areas, and pleural adhesions (Plate 3). These findings were consistent with ectopic migration of *Fasciola* flukes and secondary bacterial infection. In accordance with standard meat inspection protocols (FAO, 2007), both the liver and lungs were condemned.

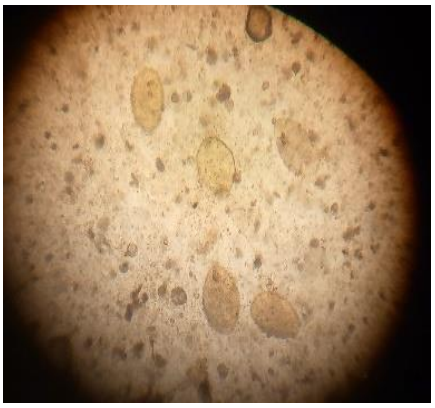

Plate 1. Oval eggs of *Fasciola* on fecal sedimentation as seen under the microscope x10, x40 magnification

Plate 2. Showing harvested *Fasciola* from the condemned organs

Plate 3. Showing the condemned liver and lungs with lesions

DISCUSSION

Bovine fasciolosis is one of the most important parasitic diseases of livestock, with *F. gigantica* predominating in Africa (Nukeri *et al*., 2022; Banwo *et al*., 2023). This case highlights an unusual presentation where both hepatic and pulmonary tissues were simultaneously condemned due to the ectopic migration of immature flukes. Comparable cases have been reported in goats (Oljira *et al*., 2022) and buffaloes (Seyedrasouli *et al*., 2023; Mancera *et al*., 2024), but reports in cattle are rare.

Economic losses from fasciolosis are substantial, arising from liver condemnation, reduced milk and meat yield, infertility, and increased treatment costs (Girma *et al*., 2024; 2025). The concurrent condemnation of both liver and lungs represents an amplified economic burden. Moreover, ectopic lesions may mimic other conditions such as bacterial pneumonia (Corda *et al*., 2022), complicating diagnosis.

The ectopic migration observed here illustrates the complexity of host–parasite interactions, possibly involving aberrant migration of juvenile flukes via the vasculature into systemic circulation (Flores-Velázquez *et al*., 2023). In addition, drug resistance is an emerging challenge: triclabendazole, the treatment of choice against *Fasciola*, is increasingly compromised by resistant strains (Kelley *et al*., 2016; Beesley *et al*., 2023).

From a zoonotic perspective, fasciolosis remains a neglected but significant public health concern. In endemic regions, humans acquire infection through the consumption of aquatic vegetation contaminated with metacercaria (Abaya *et al*., 2023). With millions at risk, fasciolosis requires an integrated One Health approach. Control strategies must combine regular anthelmintic administration, snail intermediate host management, improved grazing practices, and enhanced abattoir surveillance. Adoption of molecular and serological diagnostics will improve early detection and facilitate targeted interventions (Yihunie *et al*., 2024).

CONCLUSION

This case demonstrates the severe parasitological and pathological consequences of fasciolosis in cattle, with concurrent hepatic and pulmonary involvement leading to condemnation of vital organs. Such cases represent not only a direct economic burden to farmers but also a public health concern due to the zoonotic potential of *Fasciola* spp. Routine veterinary surveillance, integrated parasite control strategies, and stronger abattoir inspection frameworks are urgently needed to reduce the impact of fasciolosis in endemic regions. In addition, a One Health framework is essential to safeguard livestock productivity, food safety, and human health in the endemic areas.

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