

Acute Suppurative Thyroiditis Complicated with Hepatic Degeneration in a Yankassa Sheep: A Postmortem Report

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ABSTRACT

Suppurative thyroiditis is a rare but potentially fatal bacterial disease. Most bacterial infections of the thyroid gland occur via the pyriform sinus fistulae and by hematogenous spread from systemic bacterial diseases. A 2 year-old Yankassa ewe was presented with complaint of anorexia, weakness and a swelling 4-5cm around the ventral neck region near the larynx. Swelling was identified as abscesses. The cut section of the gland contained a thick creamy purulent exudate from which *Staphylococcus aureus* was isolated. Microscopically there was necrosis and accumulation of neutrophils and macrophages in the thyroid gland. The liver showed fatty degeneration of the hepatocytes. *Staphylococcus aureus*, a pyogenic bacterium is a normal micro biota but can also be an opportunistic pathogen especially with immunosuppression. Most of the published literature on acute suppurative thyroiditis are related to humans. Hence in this report we present a rare case of thyroiditis caused by *Staphylococcus aureus* in Ovine species.

Keywords: Neutrophilic Infiltrations; *Staphylococcus aureus*; Suppurative; Thyroiditis; Yankassa

INTRODUCTION

Suppurative thyroiditis is a rare but potentially fatal bacterial disease. It accounts for 0.1-0.7% of all thyroid diseases (Akuzawa *et al.*, 2017). The thyroid is normally very resistant to infection. This is mainly due to a relatively high amount of iodine in the tissue as well as its high vascularity and the lymphatic drainage to the region (Melmed *et al.*, 2008). Acute suppurative thyroiditis occurs as a result of infection by various microorganisms, including Gram-positive aerobes such as *Staphylococcus aureus* and *Streptococcus spp* (Akuzawa *et al.*, 2017). Most bacterial infections of the thyroid gland occur via the pyriform sinus fistulae and by hematogenous spread from systemic bacterial diseases. Direct extension of contiguous infection also plays a role in the occurrence of the acute suppurative thyroiditis (Paes *et al.*, 2010). Common clinical signs of acute suppurative thyroiditis include but not limited to anterior neck pain on palpation, swelling, pyrexia and an elevated leucocyte count (Akuzawa *et al.*, 2017).

Case Presentation

On the 15th March, 2019 an ewe was presented with a chief complaint of weakness and emaciation to the Large Animal Unit of the Veterinary Teaching Hospital, University of Maiduguri, Borno State, Nigeria. The ewe was 2 years old, Yankassa breed with an approximate weight of 23 kg. The

client noticed that his ewe was off feed 5 days prior to presentation, exhibiting signs of weakness and there was a swelling 4-5cm around the ventral neck region near the larynx. There was pyrexia with a temperature of 40.4 °C, with a slight restriction upon movement of the neck. The animal later died few minutes after physical examination and was sent to the Veterinary Pathology Unit for Necropsy.

Necropsy Findings

Gross Examination

On physical examination carcass was slightly emaciated. There were bilateral swellings on each side of the trachea at the ventral area of the mandible. Swellings were identified as abscesses when cut open. The cut section of the gland contained a thick creamy purulent exudate. Liver appeared pale with a diffuse yellowish area.

Microbiological Findings

Sterile swab taken from the exudate was inoculated onto Mannitol salt agar and incubated at 37 °C for 48 hrs, the result yielded a positive growth of *Staphylococcus aureus*.

Histopathologic Findings

Microscopically there was necrosis and accumulation of neutrophils and macrophages in the thyroid gland. The liver showed fatty degeneration of the hepatocytes.

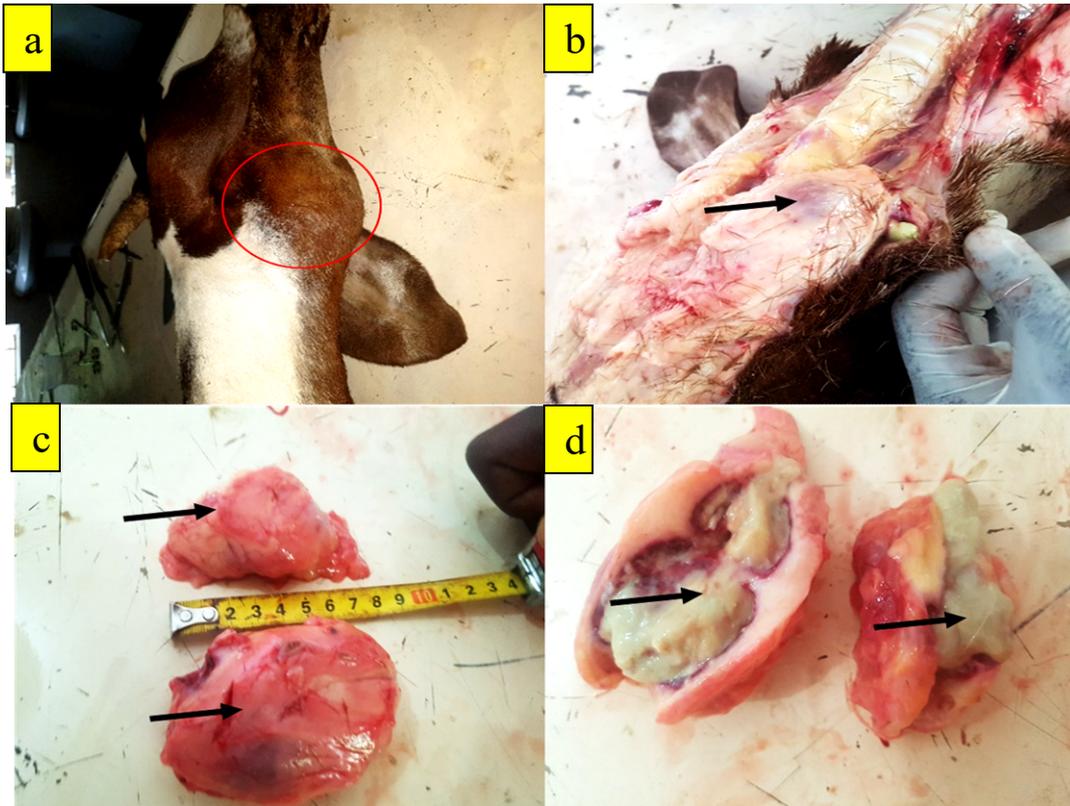


Figure 1: Photographs of the thyroid gland showing (a) swollen neck region (red circle), (b) swollen and hyperemic thyroid gland (c) excised thyroid tissue (d) cut section of the gland showing thick creamy exudate (pus)

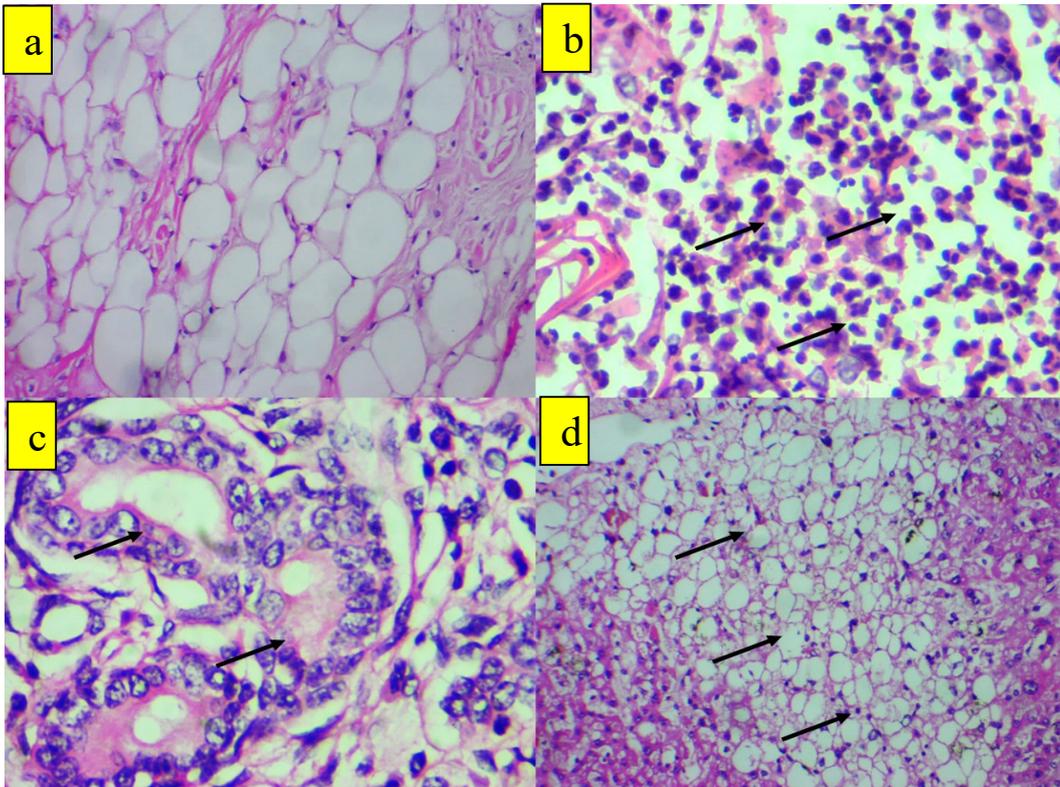


Figure 2: Normal thyroid gland showing follicles of different sizes (a), diffuse infiltration of neutrophils within the inflamed thyroid gland (b), necrosis of thyroid follicular cells typified by nuclear pyknosis and cytoplasmic eosinophilia (c), fatty degeneration of hepatocytes typified by large cytoplasmic vacuoles with nuclei displaced to the periphery (d), H and E x 100.

DISCUSSION

Due to its encapsulated structure, high vascularity, lymphatic drainage, uptake of iodine and hydrogen peroxide, the thyroid gland is generally resistant to infections. In this case report, we present a rare case of suppurative thyroiditis in sheep as most documented reports occur mostly in humans. The presence of a pyriform sinus fistula, third and fourth branchial arch abnormalities, and an immunosuppressive state predisposes the gland to acute suppurative thyroiditis (Akuzawa *et al.*, 2017). The thyroid hormone influences all major metabolic pathways. In this report there was fatty degeneration of the hepatocytes this was suggested to be due to the decrease production of the thyroid hormone by the gland which affects the metabolism, synthesis, mobilization and degradation of lipids, and probably other nutritional excesses and/or deficiencies (Pucci *et al.*, 2000). *Staphylococcus aureus* is a normal micro biota but can also be an opportunistic pathogen especially with immunosuppression (Masalha *et al.*, 2001). The accumulation of pus within the thyroid occurs as result of influx of neutrophils to the site of infection (Pucci *et al.*, 2000). Early diagnosis of acute suppurative thyroiditis is quite important to avoid a fatal outcome. Diagnostic technique such as X-ray and ultrasonography can be used to achieve a proper diagnosis. However hormonal assay (immunoassays) can be more accurate in determining the concentration of the thyroid hormones (triiodothyronine and tetraiodothyronine) in the blood, decreased concentrations will be obtained in this scenario producing a state of a primary hypo function of the gland.

Conclusion

This report documents a rare case of acute Suppurative thyroiditis in a Sheep. The Sheep died as a result of septic shock associated with the condition. Early detection and prompt thyroidectomy might have averted the mortality seen in this case.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

Author's Contribution

DTY performed the necropsy, studied the histopathological slide and drafted the manuscript. DLM studied the histopathological slide and edited the manuscript. JSB performed the necropsy and edited the manuscript. YA edited the manuscript and interpreted the histopathological slides. JOAO edited the manuscript.

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