



Obstructive urolithiasis in a Ram: A post mortem report

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Abstract

A 3-year-old Yankasa-Ouda cross breed ram was presented to the Veterinary Teaching Hospital, Usmanu Danfodiyo University Sokoto with complaints of inappetance and respiratory distress. There was rapid labored breathing and rectal obstruction on clinical examination. The ram died before further diagnostics and medical intervention. Postmortem lesions associated with obstructive urolithiasis are reported and discussed.

Keywords:; Obstruction, postmortem, ram, urolithiasis

Introduction

Urolith or calculus is a common cause of urethral obstruction in male ruminants (Braunet *et al.*, 2006; Van Saun, 2007; VinodhKumar *et al.*, 2010). Obstruction occurs primarily at the sigmoid flexor and or urethral process (Tiruneh, 2000). Environmental, nutritional, climatic, anatomical and physiological factors have been implicated in the development of obstructive urolithiasis. Clinical signs of urethral obstruction due to calculi may vary depending on severity of the condition. Inappetance, restlessness, depression and micturation problems are early indications (Nagy, 2009). At this stage management practices are successful (Kingston & Staempli, 1995). Severe conditions require radical approach. Perineal urethrostomy, tube cystotomy, bladder marsupialization and urethral translocation have been performed with marginal success (Van Saun, 2007).

When several unrelated signs follow a disease process, postmortem examination will allow an accurate diagnosis to be made. This is especially true for cases with mortalities amidst inadequate clinical history and laboratory findings. Urethral obstruction has been extensively reported in ruminant species (Kingstone and Staempli, 1995). However, few or no reports have been found in this region. In this report, an attempt has been made to establish the likely course or pathogenesis of the condition.

Case Report

A 3-year-old Yankasa-Ouda cross breed ram with a white and brown hair coat weighing 40kg was presented to the Veterinary Teaching Hospital, Usmanu Danfodiyo University Sokoto with the chief complaints of inappetance and respiratory distress. The respiratory distress was observed a day prior to presentation to the hospital. The ram was purchased about 6 months before presentation and managed semi-intensively with seven other sheep in the flock.

On physical examination, there was rapid laboured breathing. A rectal obstruction was noted when a rectal temperature was obtained. The temperature was 38.8 °C. Serous, clear fluid oozed from the mouth of the ram. The ram died within 5 minutes prior to other diagnostic or medical intervention.

At necropsy, the carcass was fresh and well fleshed. Severe subcutaneous diffuse ecchymotic and petechial hemorrhages were observed. There was marked froth in the trachea. The lungs were moderately hyperemic, enlarged and edematous with mild ecchymotic hemorrhages. The bronchi were slightly congested and contained little amount of froth. The thorax contained 500ml of clear fluid. The heart and liver were slightly enlarged. The rumen content contained few undigested silk materials. There were severe ecchymotic hemorrhages on the mucosa of the small intestine, a 2cm jejunal intussusception (Plate I) and dried feces obstructing the rectum. The kidneys were severely

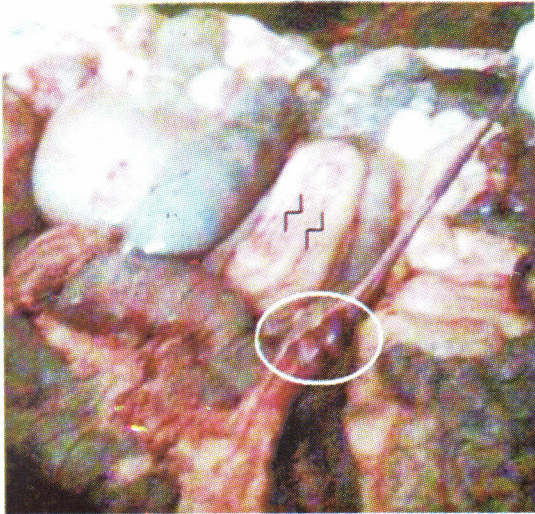


Plate I: Gastrointestinal tract showing jejunal intussusception (circled) and intestinal haemorrhage

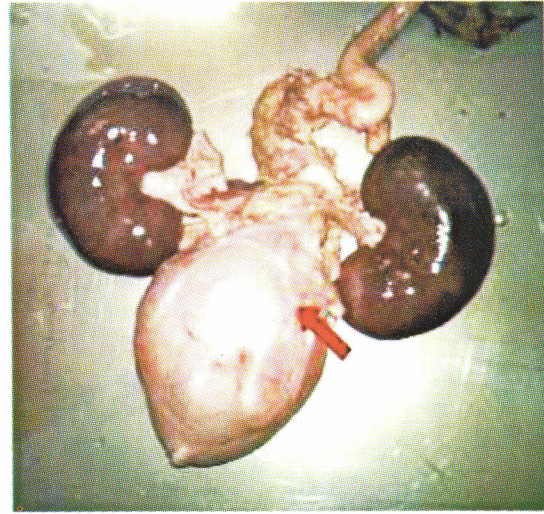


Plate II: Urinary tract showing marked renal enlargement, distended ureters and urinary bladder (arrow)

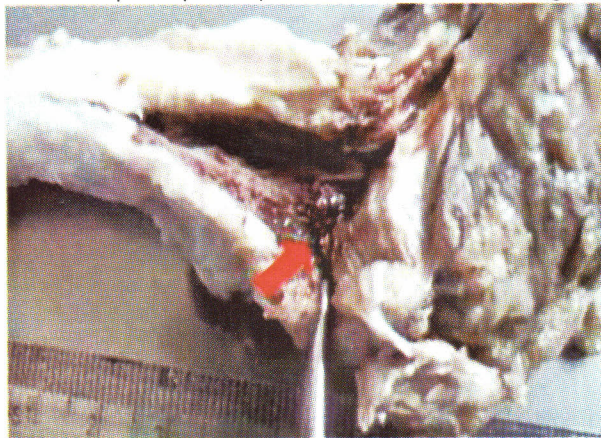


Plate III: Urethra showing calculi at point of obstruction (arrow)

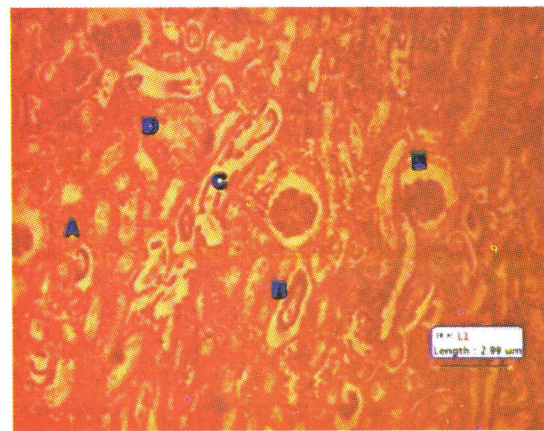


Plate IV: Transverse section of the kidney (H&E X100) showing diffuse interstitial oedema (A), tubular degeneration (B), tubular necrosis (C), glomerular capillary rupture (D) and enlargement of the Bowman's space (E).

enlarged. There were pale areas, ecchymosis and petechiae on the kidney cortex. The ureters and urinary bladder were severely distended with urine (Plate II). The accessory sex organs (prostate) were moderately enlarged and the pores of the urethral glands visibly dilated. The urethral passage (Plate III) was blocked with a reddish brown substance through its length anterior to the sigmoid flexor and severely dilated cranial to the point of obstruction.

Histologically, in the kidney (Plate IV), there are diffuse interstitial oedema, tubular degeneration and necrosis, glomerular obsolescence and enlargement of the Bowman's space.

Discussion

Urolithiasis is a condition which refers to presence of calculi in the urinary passages (Bani *et al.* 2007). The condition is termed obstructive urolithiasis when the calculi cause partial or complete urethral obstruction.

Obstructive urolithiasis is seen primarily in young castrated male ruminants which are fed high concentrate diet or on problematic pastures (Hooper, 1998; Radostits *et al.*, 2000; Tiruneh, 2000). The pathogenesis basically involves development of nidus, precipitation of solutes and concretion by cementing precipitated salts (Maxie & Prescott, 1993; Bani Isma'il, 2007), and it is multi-factorial (Sulvian 2007). Clinical signs may go unnoticed until there is urethral or bladder rupture (Hooper, 1998; Radostits *et al.*, 2000). Water deprivation or drought result in increased urine concentration and predispose individuals to urolithiasis (Tiruneh, 2000; Sulvian, 2007). The lesions observed here are as a result of urethral obstruction resulting in renal insufficiency, uremia, respiratory distress and death. Some of these are similar to necropsy lesions found by Waltner-Toews & Meadows (1980) in a steer that died of urolithiasis. High concentrate diet and water deprivation were contributory factors.

Tiruneh (2000) made similar observations in a retrospective study of urethral obstruction conducted in Ethiopia. Exogenous oestrogenic compounds or ingestion of oestrogenic plant might have initiated nidus formation. The latter presumed by enlargement of accessory sex organs was reported in wether by Ladds (1993), Maxie & Prescott (1993).

Obstruction causes urine stasis and the bladder becomes distended. There will be urine reflux exerting pressure on the renal tissue leading to hydronephrosis and renal dysfunction. Bladder and or urethral rupture are common findings (Hooper, 1998; Tiruneh, 2000). Moreover, failure to excrete waste materials out of the body has widespread effect on various systems when cumulative. Thus, a hemorrhagic uremic syndrome (HUS) characterised by petechiae and ecchymoses of the kidney, subcutis and intestine. Maxie & Prescott (1993) reported a likely association of blood factor III with the bleeding disorder seen in uremia. Haemorrhages were also reported by Waltner-Toews & Meadows (1980). Another possible explanation is

disseminated intravascular coagulation (DIC) and septicemia secondary to jejunal necrosis and translocation of bacteria across the intussusception. Hydrothorax and fecal obstruction of the rectum were not previously reported. The former could explain the reason for respiratory distress manifested at antemortem. Whilst lack of water intake and subsequent attempt by the body to conserve water by maximal reabsorption (at the rectum) resulted in feco-rectal obstruction, left sided heart failure caused pulmonary congestion, increased hydrostatic pressure at the venous end of pulmonary capillaries and oedema (hydrothorax). Death due to uremia is usually the final outcome of untreated urethral obstruction (Radostits *et al.*, 2000).

Obstructive urolithiasis is an economically important urinary disease of ruminants. If early diagnosis was made and appropriate treatment instituted, severity of the condition could have been reduced. However, dietary management is the key to control and prevention.

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