

First Reported Case of Hydrops Foetalis in a Nigerian Breed (Uda) of Sheep

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Abstract

Background: Hydrops foetalis is a rare foetal anasarca or generalized edema encountered in sheep, other animals and humans. In this paper, the first clinically diagnosed case of hydrops foetalis in a Nigerian breed of sheep is reported.

Case report: An Uda sheep, with the chief complaint of prolonged straining was presented to the Veterinary Clinic in Sokoto metropolis, Sokoto State Nigeria. Physical examination revealed marked abdominal distension; large, slightly immovable mass was felt on the ventral abdomen. Clinical examination through the vagina revealed dystocia due to foetal oversize and a caesarian section (CS) was recommended. After the CS, a large and edematous foetal carcass weighing 9.7 kg was recovered from the ewe. Subsequently, the carcass was deposited at the Postmortem Unit, Veterinary Teaching Hospital, UDUS for further investigation. Therefore, postmortem examination report is presented.

Conclusion: This case demonstrated the dominant features of hydrops foetalis in sheep. The foetus might have died as a result of prolonged labor by the dam, anaemia and associated hypoxia due to pulmonary hypoplasia.

Keywords: Hydrops foetalis; Dystocia; Postmortem; Sheep; Sokoto Nigeria

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I. Introduction

Hydrops foetalis is a rare foetal anasarca or generalized edema encountered in sheep, other animals and humans. Foetal anasarca is also called by several names, such as *hydrops foetalis*, foetal hydrops, congenital dropsy and bulldog lambs^{1,2}. The condition is characterized by excessive accumulation of fluid in one or more foetal compartments, including ascites, pleural effusion, pericardial effusion, and skin edema^{1,3,4}. Hydropic foetuses have been classified as mild or severe by Van Kamp *et al*⁵. A mild foetal hydrops is defined as the presence of a distinct rim of ascites, with or without pericardial effusion. While severe form is characterized by the presence of a more abundant amount of fluid collection, usually ascites, with skin edema⁶. *Hydrops foetalis* have also been categorized on the basis of their causes, namely immunologic or non-immunologic depending on the presence or absence of maternal antibodies against foetal red blood cell antigens^{7,8}. The pathophysiology of both conditions was attributed to a variety of disorders including hypoproteinemia, cardiovascular defects, increased capillary permeability, portal venous obstruction or malformation of the lymphatic system^{7,8,9}. Foetal systemic infection is a predisposing factor to the development of *hydrops foetalis*, especially in the presence of hepatitis due to parvovirus or adenovirus infection. The accompanying hepatitis with these infections can compromise the protein synthesis of the foetus, thus decreasing the foetal oncotic pressure in the vascular space and resulting in fluid loss from the circulation¹⁰. Foetal monsters, including hydropic foetuses have been implicated in foetal-associated dystocia. Foetal dystocia is mainly due to oversize, mal-disposition, and monsters². Dystocia is a major cause of lamb losses in the flock and could result in economic setbacks to the farmers¹¹. Hence, early detection such as ultrasonography could improve the chances of foetal survival.

II. Case Report

In the case report, a 4-year-old sheep (*Uda*) weighing 50 kg was presented to a Veterinary Clinic in Sokoto metropolis, Sokoto State-Nigeria with the chief complaint of difficulty in giving birth. The situation was noticed a day prior to presentation at the clinic, history further revealed previous successful lambing with no

medical and vaccination records. Physical examination revealed marked abdominal distension in the ewe; large, slightly immovable mass was felt on the ventral abdomen. Clinical examination through the vagina revealed dystocia due to foetal oversize and a caesarian section (CS) was recommended. After CS, a large and edematous foetal carcass weighing 9.7 kg was recovered from the ewe. Subsequently, the carcass was subjected to radiographic examination before further investigation at the Postmortem Unit, Veterinary Teaching Hospital, UDUS.

Postmortem Report: On gross examination, the carcass appeared fresh and pale, with alopecia and generalized oedema termed 'bulldog' lamb (Plate 1). Excess serous fluid measuring four (4) litres was recovered from various fetal compartments, including ascites, pleural effusion, pericardial effusion, and subcutaneous oedema (Plate 2 & 3). The lungs tissues were markedly congested and hypoplastic (Plate 4). There were severe liver enlargement and moderate congestion of intestines (Plate 5). Earlier before the necropsy, radiographic examination revealed well-developed foetal bony structures from cranium to the extremities (Plate 6).

Discussion: The principal findings in the hydropic foetal carcass were anemia, increased body weight, marked anasarca and severe effusions in the thoracic and abdominal cavities. The findings were synonymous to many previous reports on *hydrops foetalis* in animals and humans. *Hydrops foetalis* is a rare condition whereby excess fluid collection is found in various foetal body cavities. Such as ascites, pleural effusion, pericardial effusion, and subcutaneous edema^{1,3,4}. The condition affects foetus mainly¹¹, but in some cases there are maternal complications including edema and dystocia². *Hydrops foetalis* appears to have been a progressive development *in utero* in late gestation, leading to an oversized oedematous foetus and subsequently foetal losses and/or foetal associated dystocia^{2,3}. *Hydrops foetalis* was previously thought to be secondary to maternal-foetal blood group incompatibilities, but later it was realized that over 90% of cases were non-immunological in nature^{12,13,14}. The pathophysiology of both immune and non-immune *hydrops foetalis* is attributed to a variety of conditions such as hypoproteinaemia, cardiac failure, hepatitis, increased capillary permeability, portal venous obstruction or malformation of the lymphatic system^{7,10}. *Hydrops foetalis* can be classified on the basis of the presence or absence of anaemia. This classification allows for a more specific approach towards diagnosis and treatment¹⁵. Foetal anaemia is mostly due to haematological disorders, such as glucose-6-phosphate dehydrogenase deficiency, pyruvate kinase deficiency, aplastic anaemia, congenital leukaemia and congenital dyserythropoietic anaemia. Intrauterine foetal infections associated with parvovirus B19, toxoplasmosis, adenovirus, coxsackie virus, rubella, cytomegalovirus, leptospirosis and congenital hepatitis, and syphilis have been linked to the development of anaemic *hydrops foetalis*^{16,17}. As observed in the case report, various malformations that have been described in relation with foetal hydrops⁷, have concomitant pulmonary hypoplasia affecting one or both lungs as an additional finding. The suggested explanation of lung hypoplasia and hydrops, was that a common effect of reduced thoracic volume with hydrops after occurring due to high intrathoracic pressure hinders venous return from the placenta¹⁰. Similarly, it was believed to be the result of limited space in the thoracic cavity due to a swollen liver and diaphragm that was pushed upward from the fluid that collected in the abdomen.

Foetal hydrops is primarily recognized by ultrasonographic examination during the first or second trimester of gestation. Significant fluid collections are easily detected, but fluid accumulation may also be limited and thus escape routine ultrasonographic detection¹⁸. The overall prognosis of fetal hydrops is poor, with a perinatal mortality rate between 50% and 98%¹⁹. Prognosis depends on the etiology, gestational age at onset, and whether pleural effusions are present. However, the underlying mechanisms that lead to hydropic fetuses remain uncertain²⁰. Cases of *fetal hydrops* should be referred promptly to a tertiary veterinary care center for evaluation.

III. Conclusion

This case demonstrated the dominant features of *hydrops foetalis* as previously reported in animals and humans. The fetus might have died as a result of unproductive labor by the dam, anaemia and associated hypoxia due to pulmonary hypoplasia. Early detection and obstetrics intervention may increase the chances of fetal survival in the flock.



Plate 1: Hydropic foetus recovered after caesarean section.

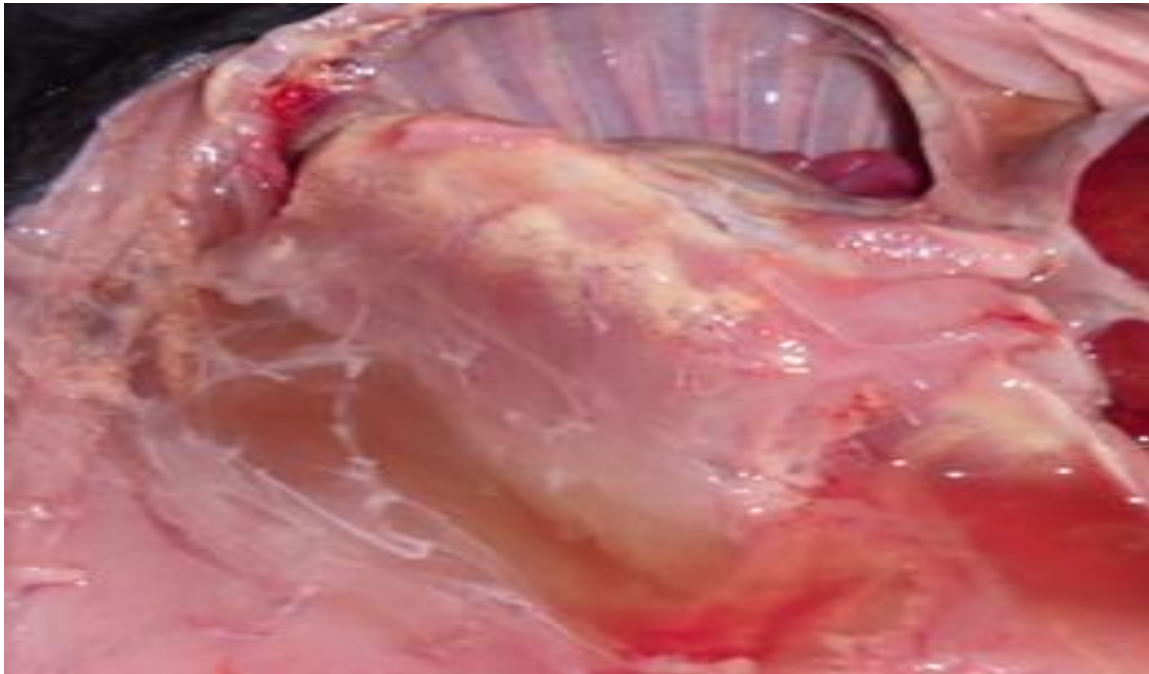


Plate 2: Fluid in the thoracic cavity



Plate 3: Presentation of subcutaneous oedema

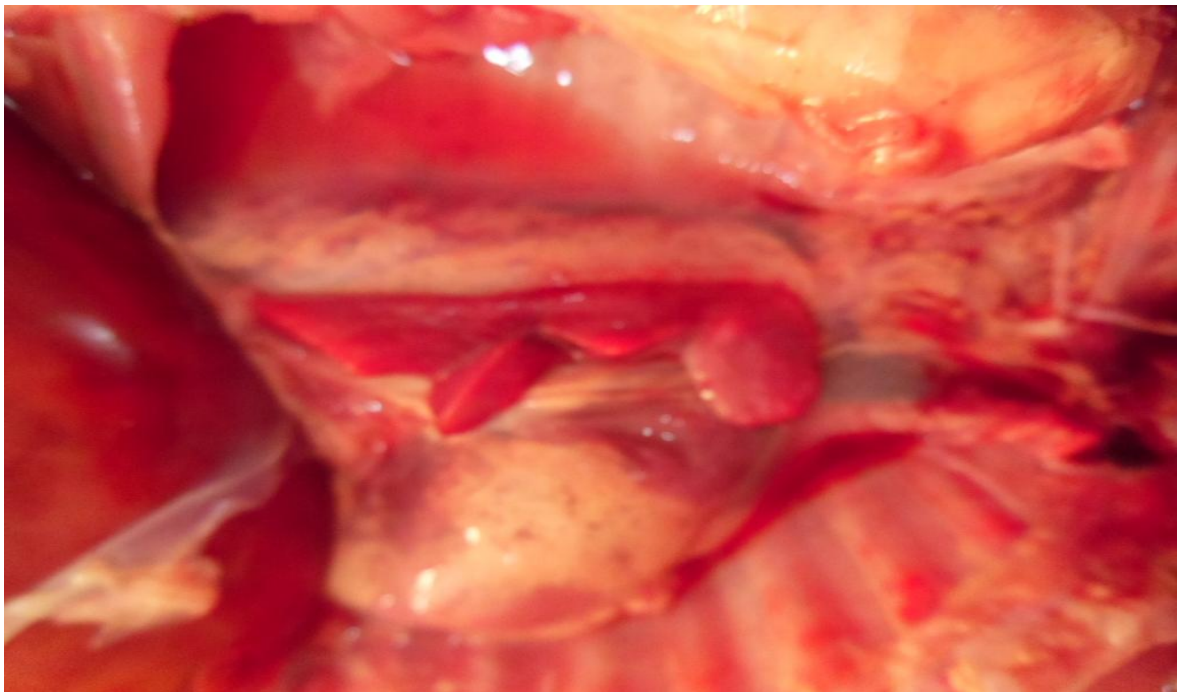


Plate 4: Marked congestion and hypoplasia of the lungs

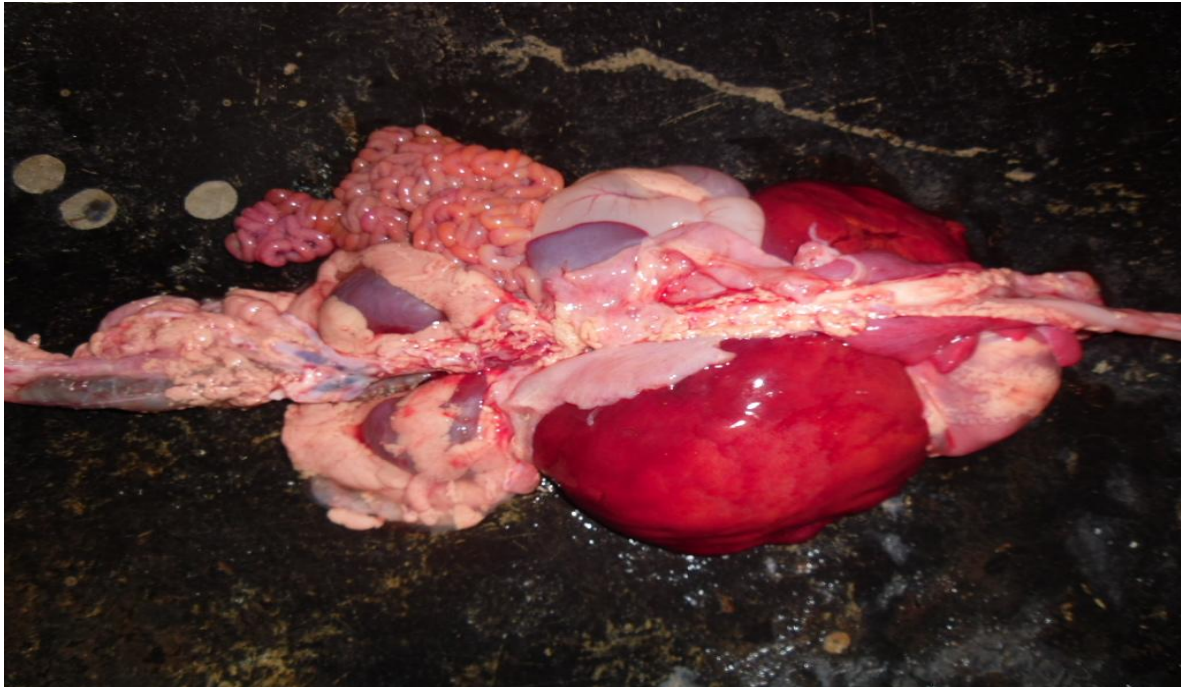


Plate 5: Features of hepatomegally and congested intestines



Plate 6: Normal pelvic development

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