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Fetal Arthrogryposis Multiplex Congenita as a Cause of Dystocia in a 3-Year-Old Balami Ewe

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ABSTRACT

This paper presents a case of dystocia due to Fetal Arthrogryposis Multiplex Congenita in a three-year-old Balami Ewe. The case was presented to Senator Ali Sheriff Veterinary Hospital, Maiduguri, Borno State by a client who noticed unproductive labor for approximately three (3) hours after rupture of the water bag. Physical examination of the Ewe revealed presence of fetal head and thorax in anterior longitudinal presentation with extended forelimbs hanging through the vulva, however, the hind limb was lodged in the birth canal. A pedal and suckling reflexes were observed in the lamb and obstetrical examination revealed a tail and flexed hocks impacted within the birth canal. There was adequate pelvic dimension and spacing that allowed per-vaginum manoeuvring and traction for relieve of the dystocia. A live fetus was delivered although characterized with ankylosed joints of the hind limb, deformed lumbo-sacral vertebral column, kyphosis of the thoracic spines with very poor gait when the lamb attempts to stand. In addition, the dam was weak and required support in order to stand. Supportive therapy involved intravenous infusion of 5% Dextrose saline (500mL) and intramuscular injection of Diclofenac sodium given at 2.5mg/kg body weight. Oxytocin (10I.U) was administered intramuscularly to facilitate uterine involution and reduced post-parturient hemorrhage. The fetus was placed on colostrum obtained from the dam but died within 24 hours of birth; however, the supportive therapy was continued for the dam for 3 days' post-partum. Follow-up assessments showed that the Ewe has regained a stable condition with no signs of retained fetal membranes, septicemia or metritis. The client was advised to avoid rebreeding the ewe and to use rams with proven reproductive histories for further breeding and genetic control.

Keywords: Arthrogryposis; Balami Ewe; Dystocia

INTRODUCTION

A rare hereditary musculoskeletal birth defect in neonates, periodically reported as a cause of dystocia in many species is the Arthrogryposis Multiplex Congenita (AMC). This condition is well documented in cows (Kamalakar *et al*., 2016; Sitali *et al*., 2017), humans (Achour *et al*., 2017; Pius *et al*., 2018; Sawafta *et al*., 2025) as well as in small ruminants like sheep and goats (Raja *et al*., 2016; Singh *et al*., 2020; Yadav *et al*., 2020). Syndrome of AMC in sheep consist of mixed clinical features including severe joint malformation of the fetal limbs, muscle atrophy with functional impairments, moderate to marked curvature of the dorsal spine (kyphosis) and deformed lumbo-sacral vertebral column (Singh *et al*., 2020). The etiology of Arthrogryposis Multiplex Congenita are still poorly understood, however, the interplay between chromosomal aberration, toxic substances, and infections that may impede neuromuscular development and functions during pregnancy are incriminated factors (Navti *et al*., 2010; Sitali *et al*., 2017; Sawafta *et al*., 2025). Noteworthy is that, adequate prenatal growth is dependent on fetal movement within the amniotic fluid and inability of passive extension and flexion of the fetal parts culminates varying morphologic defects associated with AMC in newborns (Witters *et al*., 2002; Achour *et al*., 2017). A case in affected human autopsy is well documented and showed facial abnormalities, contractures, short neck of the fetus, ankylosed temporomandibular joint, pulmonary hypoplasia and severe lumbar scoliosis (Achour *et al*., 2017).

In sheep, diagnosis of Arthrogryposis Multiplex Congenita is highly linked to inherited autosomal recessive mutations, which typically renders affected

lambs weak and nonviable (Singh *et al*., 2020; Yadav *et al*., 2020). AMC is a cause of major losses in the production of many meat-type sheep and goat breeds (Bukar *et al*., 2006; Singh *et al*., 2020; Yadav *et al*., 2020) as well as cattle breeds (Sitali *et al*., 2017; Adeyemi and Aina 2020), highlighting the need for improved surveillance through case reports to enable development of preventive measures for enhanced flock productivity and animal welfare. At present, cases of fetal Arthrogryposis are well reported in many species, but with fewer reports on their possible cause of dystocia in sheep. This paper presents a case of dystocia caused by Fetal Arthrogryposis Multiplex Congenita in a three-year-old Balami Ewe in Nigeria.

CASE PRESENTATION

A 3 years old Balami Ewe weighing 40kg was presented to Senator Ali Sheriff Veterinary Hospital, Maiduguri on the 3rd of April, 2025 with a history of unproductive labor pain for approximately three (3) hours after rupture of the water bag. According to the client, the Ewe had delivered twice in the past with a single normal lamb without any assistance but the presence of fetal parts at the vulva for hours without progressive delivery prompted their decision of reporting the case to the Hospital. Physical examination of the Ewe revealed presence of fetal head and thorax in anterior longitudinal presentation with extended forelimbs hanging through the vulva. A pedal and suckling reflexes were observed in the lamb but the hindlimb was lodged in the birth canal. Clinical examination revealed rectal temperature (39.2 °C), respiratory rate (38 cycles/min), pulse rate (86 beats/min) and a pinkish mucous membranes color. In addition, a tail and flexed hocks impacted within the birth canal was observed through obstetrical examination. The joints of the hindlimb and muscles were palpable per vaginum with enough pelvic dimensions and spacing that allowed manual traction for relieving the dystocia. The dam was weak and could not stand without a support.

MANAGEMENT

This involved per-vaginum maneuvering and traction for relieve of the dystocia. It began by proper restraint of the ewe on lateral recumbency and epidural administration of 2mL xylocane into the sacro-coccygeal space. The vagina passage was lubricated with KY jelly before the manual traction, done carefully to prevent injury to the genital tract. A live fetus was delivered although characterized with ankylosed joints of the hindlimb, deformed lumbo-sacral vertebral column, kyphosis of the thoracic spines with very poor gait (Figure 1 and 2). The fetus was placed on colostrum obtained from the dam but died within 24 hours of birth. The Ewe was managed with supportive therapy and this was done by intravenous infusion of 5% Dextrose saline (500mL), intramuscular injection of Diclofenac sodium given at 2.5mg/kg body weight as analgesics and Oxytetracycline (5%) administered intramuscularly at 1ml/20kg body weight for 3 days' post-intervention. Oxytocin (10I.U) was uterotonic drug administered intramuscularly to facilitate uterine involution and support reduced post-parturient hemorrhage. Follow-up assessments showed that the Ewe has regained a stable condition with no signs of retained fetal membranes, septicemia or metritis. As part of the management, the client was advised to avoid rebreeding the ewe and to use rams with proven reproductive histories for further breeding and genetic control.

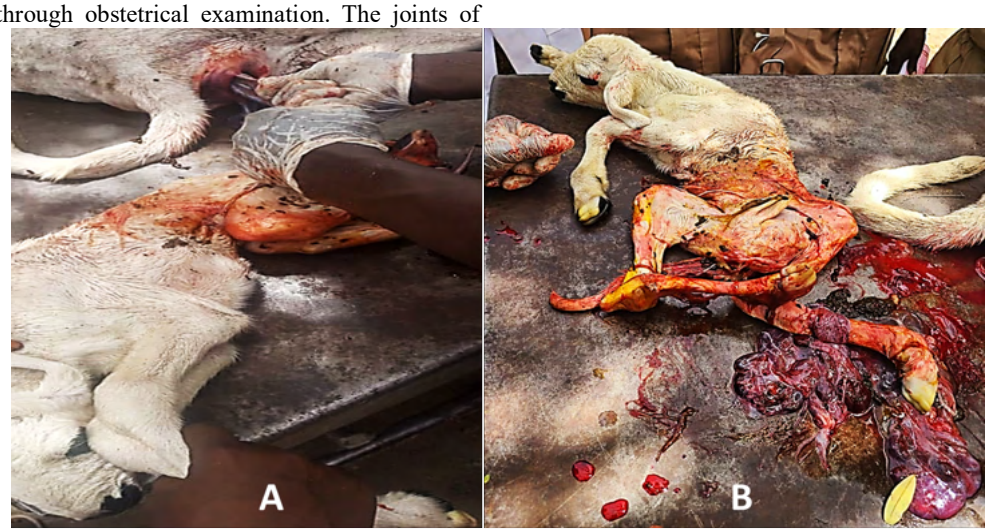

Figure 1: Per vaginum delivery of a lamb with Arthrogryposis Multiplex Congenita (AMC) (**A**), Ankylosed joints of the hindlimb and deformed lumbo-sacral vertebral column in fetal Arthrogryposis (**B**).

DISCUSSION

This report reveals a less frequently reported cause of dystocia in sheep. It describes a case of dystocia in a 3-year-old Balami Ewe caused by Fetal Arthrogryposis Complex Congenita (AMC). According to the client, the presence of fetal parts at the vulva for more than 3 hours without progressive delivery informed the decision to bring the case to the Hospital. The diagnosis was based on physical examination and obstetrical findings which revealed a flexed hock and deformed hind limb impacted within the birth canal of the Ewe. Liveability test of the fetus was confirmed by pedal and suckling reflexes and manual traction was adopted as the obstetrical approach to relieving the dystocia. Clinical examination showed a normal rectal temperature (39.2 °C) and pulse rate (86 beats/ min), although the dam

was weak and required support in order to stand. Supportive therapy was done by intravenous infusion of 5% Dextrose saline (500mL) and intramuscular injection of Diclofenac sodium given at 2.5mg/kg body weight as analgesics. Oxytocin (10I.U) was uterotonic drug administered intramuscularly to facilitate uterine involution and support reduced post-parturient hemorrhage. The supportive therapy was continued for 3 days' post delivery period.

Figure 3: Kyphosis of dorsal spine in live neonate with Arthrogryposis Multiplex Congenita indicated by white arrow traction

Examination of the delivered fetus revealed ankylosed joints of the hind limb and deformed lumbar vertebral column in a live fetus. A similar observation was made in the reports of Singh *et al*. (2020) and Yadav *et al*. (2020). The deformed hindlimb makes standing gait impossible for the live fetus, which was not in the reports of Singh *et al*. (2020) and Yadav *et al*. (2020) since both authors reported delivery of dead fetuses. Additionally, kyphosis of the dorsal spine was observed in this case similar to the reports of Yadav *et al*. (2020) in a goat (*Capra hircus*). Thorough examination of the placenta revealed completely detached placentomes with some quantity of placenta fluid. This observation agrees with similar reports of Raja *et al*. (2016) and Singh *et al*. (2020) in reported Arthrogryposis cases in Ewe. It is important to note, that the extent of congenital malformation informs the type of obstetrical maneuvering required for easy parturition in a given species. Manual traction was adopted in the present case because of the good pelvic dimension and spacing for per-vaginal maneuvering. Multiple factors are associated with Arthrogryposis in many species including humans; however, a major cause revolves around the interplay between chromosomal abnormalities and toxic substance exposure during pregnancy. These factors cause fetal akinesia and consequent poor neuromuscular development and functions (Sitali *et al*., 2017; Sawafta *et al*., 2025).

In this report, it was suspected that the deformed lumbo-sacral vertebral columns and its associated deviations within the birth canal prior to the intervention may have caused obstruction of the birth canal and the resultant dystocia. Nonetheless, it may also be due to exhaustion and failure of expulsive forces from possible overstretching of the uterine wall during passage of the thoracic spine of the fetus via the birth canal. Obstetrician must decide by comparing fetal and pelvic dimensions to ascertain possibility of moderate traction. In case of a doubt or unsuccessful per-vaginal maneuvering, cesarean section is indicated or fetotomy if one is dealing with a dead fetus (Raja *et al*., 2016). Ultrasonography can help in early diagnosis, planned intervention and treatment to prevent possible complications (such as uterine rupture, metritis, septicaemia, uterine inertia, or death) associated with Arthrogryposis. Accurate breeding and lambing record was recommended to help monitor recurrent defects. Nonetheless, the client was advised to avoid rebreeding the ewe and to use rams with proven reproductive histories for further breeding and genetic control.

Conflict of Interest

The authors have no conflict of interest to declare.

Authors Contribution

ASO, PID, ARI, and BUM, were the clinicians that handled the case at the SAS hospital. ASO. wrote the first draft and was revised by PID, ARI, and BUM. ASO wrote the second draft and was revised by WMA who was the consultant that guided the management of the case.

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