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Conjoined West African Dwarf Goat, Capra Hircus, Twins with Duplicate Heads and Shared Neck, Body, and Limbs: Case Report

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Abstract

This case report describes a rarity occurrence of dicephalic parapagus, dibrachia bipus conjoined twins in West African dwarf goats capra hircus neonates in Makurdi (Benue state), Middle Belt region of Nigeria. a condition previously undocumented in Nigeria. The twins shared a single body with two heads, attached laterally at the occipital-cervical region. This anomaly may be attributed to genetic, environmental, or nutritional factors. The occurrence of conjoined twins in production animals results in reduced productivity, emphasizing the need for veterinarians and farmers to report such cases for accurate analysis and identification of breed, and management practices. Breeding dams that have produced conjoined twins should be discouraged. This case highlights the importance of documenting and studying rare congenital anomalies in animals, providing valuable insights into developmental biology and veterinary medicine.

Keywords: Conjoined twins; Dibrachia bipus; Congenital anomaly; Capra hircus; Neonates

Introduction

Congenital or teratogenic defects observed in both humans and animals at birth are attributed to abnormalities in the genetic makeup of the species, without any known genetic predisposition [1-5]. Various aetiological factors have been linked to these defects [6]. Reports of teratological malformations are relatively scarce in veterinary literature [7-10]. However, recent reports in small ruminant species (sheep and goats) include cases such as monocephalus dipygus [11], thoraco-omphalopagus twins [8], brachiomelia in goats [12], monocephalic thoracopagus tetrabrachus [7], cephalothoracopagus twins in sheep [13] and conjoined twins in West African Dwarf Goats [2] Dicephalic twins also

called Polycephaly is a general term that describes organisms with more than one head. Dicephalus dipus dibrachius is an extremely rare congenital anomaly characterized by conjoined twinning, where an infant is born with two separate heads, two arms, two legs, and a shared single trunk. These Conjoined Twins, are extremely rare congenital anomaly occurring when two fertilized eggs fail to fully separate. or fuse during embryonic development and has never been reported in goats. After conducting a thorough search, I couldn't find any documented cases of Dicephalus dipus dibrachius in goats. This condition is extremely rare in general, and most reported cases are in humans or other animals, but not specifically in goats.

Two theories attempt to explain the origin of conjoined twins: Fission Theory: This theory suggests that conjoined twins result from the incomplete separation of two embryonic discs during early development.

Fusion Theory: In contrast, this theory proposes that conjoined twins arise from the duplication and fusion of two originally separate embryonic discs.

This results in two offspring joined together, often sharing organs or body parts.

Conjoined twins are identical and arise from incomplete fission of a single embryo during the primitive streak stage [14-17]. Such aberrations are rare, theoretical and remain relatively under-reported in domestic animals. In this article, we report a unique case of conjoined neonatal West African dwarf goats (*Capra Hircus*), joined laterally to each other at the occipital cervical region [2]. This case highlights the importance of documenting and studying rare congenital anomalies in animals, which can provide valuable insights into developmental biology and veterinary medicine.

Case Report

A female West African dwarf goat neonate, born conjoined with episiotomy intervention, was presented moribund to the Veterinary Epidemiology Clinic, Livestock Service Department, Ministry of Agriculture and Food Security, Benue State, Nigeria. The dam (Fig.1), a three-and-a-half-year-old, had a history of two previous births of twins without any malformations. The backyard farm, where the goats were reared on a semi-intensive system using a tethering method, had a population of 6 goats. The animals were not allowed to roam freely around the staff quarters but were instead returned to their pen, where they were fed a mixture of kitchen leftovers, maize offal, and hay.

Figure 1 & 2: West African Dwarf Doe and Free Neonate twin.

The present set of twins consisted of a free neonate (Fig. 2) and conjoined neonates with two forelimbs, two hindlimbs, one trunk, one single neck, and two heads forming a bifurcation laterally to each other at the occipital-cervical region. Both neonates shared one single body, apart from the two heads, which were equal in size and identical (Fig. 3 and 4). The two heads lay laterally to each other, with kid 'B' positioned similarly to kid 'A' (Fig. 3 and 4).

Unfortunately, the twins died about 20 minutes after birth due to interminable dystocia. Dorsal and lateral X-ray examinations revealed two heads attached to each other at the occipital-cervical sides, positioned side by side. This unique case highlights the importance of documenting and studying rare congenital anomalies in animals, which can provide valuable insights into developmental biology and veterinary medicine.

Necropsy and Radiological Findings

The Physical examination showed the conjoined twins were female and have two heads, equal in size. And attached to each other and positioned laterally at the occipital-cervical region (Fig. 3 and 4). The twins died 10 minutes after birth due to interminable dystocia. Radiographic examination, including dorsal and lateral X-rays, revealed that the two heads attached to each other at the occipital-cervical sides (Fig. 3 and 4) positioned side by side, and that the two esophagi emptied into a single shared stomach.

Figure 3: Dicephalic Parapagus, dibrachia bipus twin neonate WAD goats. A and B show Occipital Cervical point of attachment of Twin A and B.

Figure 4: Conjoined dicephalic parapagus dibrachia bipus twin in WAD goat.

Discussion

This case report presents the first documented instance of dicephalic parapagus, dibrachia bipus in West African dwarf goats, Capra Hircus in Nigeria with Duplicate Heads and Shared Neck, Body, and Limbs delivered through episiotomy. The etiology of this condition is multifactorial, potentially involving genetic anomalies, toxin exposure, nutritional deficiencies, or viral infections. According to Roberts [18], conjoined twins occur at a rate of 1 in 100,000 births in cattle, while in humans, the prevalence is approximately 1 in 250,000. Diplopagus, also known as Siamese or conjoined twins, are monozygotic, monoamniotic, and monochorionic, resulting from incomplete cleavage of a single ovum [19, 21-24]. This phenomenon may be attributed to blastomeric separation at an early stage, specifically up to the 8-cell stage before day 14.

This develops into an independent conceptus, comprising of embryo and placental membranes [23], or a separation of inner blastomeres within a single morula where the two embryos share a single placenta. Diplopagies such as complex craniothoracopagus, pygopagus, rachiopagus including pelvipagus are anoma lies in the separation of the embryo in the late embryonic development [24-27] and have been attributed to both environmental contributors like roentgens, viruses, toxic plants, drugs and nutritional deficiencies [2, 14, 28-32] and chromosomal abnormalities, which could be at the cellular or molecular level, thereby altering the phenotypic expression of the genes. Omphalopagus twins occur in 18-33% of conjoined cases [1]. The condition (ischiopagus) is rare in sheep, dogs, cats and horses [24]. Vanderzon et al. [24] reported parapagus conjoined twins in Holstein calf. Nottidge et al. [33] described a case of monocephalus thoracopagus tetrabrachius in a dog. Spiers et al. [7] mentioned a case of monocephalic thoracobrachius tetrabrachius in a lamb and Umayange et al. [2] reported a case of Dicephalic parapagus, tetrabrachia bipus in west African dwarf goats [2].

The present case being reported on dicephalic parapagus, dibrachia bipus in west African dwarf goats. This incidence occurred on January 27, 2026. This finding suggests that the goat became pregnant in August of the previous year and the system of rearing was semi intensive tethering method, during the rainy season. This timing and probe implies that the dam may have been exposed to certain plants due to forage scarcity during the season. Additionally, exposure to radioactive sources from power plants in the quarters and trashing of the domestic waste on the outskirts of grazing areas may be a contributing aetiological factor, as nomadic herders often traverse these regions with their animals. Hyperthermia could also play a role, as environmental temperatures can reach up to 39 to 41°C here in Benue valley during the peak of the dry season is up to 45°C [33], and has been identified as a potential contributor [22]. Recently first dicephalic case report of conjoined twins in WAD goats by Umayange et al. [2] revealed a remarkable case of conjoined twins, WAD neonates goats exhibiting complete duplication across the cranial half of the body, with the entire length of the body's trunk fused mediocaudally between the thoracic and trunk regions (thoracopagus), resulting in a shared trunk, four forelimbs (tetrabrachius) and two hind limbs (bipus). A similar case was reported by Ramadan [35] where a black coat female neonatal goat was delivered and joined at the level with the axis the trunk was single, while the neonate stool on the four legs and only survived for 10 hours. In contrast, Ahmed et al. [34] also reported a case of dicephalic Siamese in male neonates from nondiscript primiparous goats delivered with cesarian section. The similarities occur with the present case report is that their neonates shared the same trunk, two hind limbs, and two forelimbs but duplicated heads connected at the occipital region [36-40].

Notably, internal organs, including the heart, lungs, and alimentary system, were also shared by the conjoined twins, their mouth to esophagia were separate and emptied into the shared stomach.

The occurrence of conjoined twins in production animals results in reduced productivity. To better understand and address this issue of conjoined twining, veterinarians, health workers, environmentalist and farmers are encouraged to probe and report such cases, facilitating accurate analysis and identification of breed, migration patterns, predisposing factors and management practices in epidemiological surveys of these anomalies generally in animals and in goats particularly. Furthermore, breeding dams that have produced conjoined twins should be discouraged [33].

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