

Male Pseudohermaphroditism in a Lamb

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SUMMARY

This paper reports male pseudohermaphroditism identified macroscopically and microscopically in a female Akkaraman breed lamb at 4 months of age. Visual examination of the external genitalia in the lamb showed to be female with vulva. But the lamb had testes and epididymis like structure as internal genital organs. At histological examination normal vulval tissue was seen. At testicular tissue the immature seminiferous tubules were occupied only by Sertoli cells and primitive gamet like cells. The microscopic appearance of epididymis showed; cystic tubule like structures with primitive and degenerative gamet like cells.

Key Words

Lamb, Pathology, Pseudohermaphroditism

Bir Kuzuda Erkek Psödohermafroditizm Olgusu

ÖZET

Bu çalışmada; 4 aylık, Akkaraman ırkı bir kuzuda erkek psödohermafroditizm makroskopik ve mikroskopik olarak tanımlandı. Kuzu görsel bakıda sahip olduğu dış genital organ vulvası ile dişi görünmekteydi. Ancak kuzu iç genital organ olarak testislere ve epididimise benzer yapıya sahipti. Histolojik incelemede normal vulva dokusu görüldü. Testiste ise olgunlaşmamış seminifer tubullerinde sadece sertoli hücreleri ve primitif eşey hücrelerine benzer yapılar ile döşeli olduğu gözlemlendi. Epididimin mikroskopik incelemesinde kistik tubul benzeri yapılar ile primitif ve degeneratif eşey hücrelerine benzer hücreler görüldü.

Anahtar Kelimeler

Kuzu, Patoloji, Psödohermafroditizm

INTRODUCTION

Disorders of genital development occur in all mammals but not commonly (Weng et al. 2005). They are caused by abnormalities of genetic or chromosomal origin or inappropriate hormone exposure. Intersexuality can be categorized into two groups as; true hermaphroditism and pseudohermaphroditism. True hermaphrodites should have both male and female gonadal tissues. The external genitalia in these individuals may range from normal male to normal female (Alam et al. 2007, Hermaphroditism Information on Healthline 2002). The pseudohermaphrodite is characterized by a difference between the phenotypic and gonadal sex. However, most phenotypic males have hypospadias. Pseudohermaphroditism refers to gonadal dysgenesis (Hermaphroditism Information on Healthline 2002). The pseudohermaphrodite has only a single type of gonadal tissue and the animal is classified as either a male or female pseudohermaphrodite on the basis of the gonadal tissue present (Kennedy and Miller 1993). Female pseudohermaphrodites have ovaries but phenotypically have masculine appearance; male pseudohermaphrodites possess testes while having mixed or female external genitalia (Weng et al. 2005). True hermaphroditism is often diagnosed after laparoscopic investigation. An initial suspicion of male pseudohermaphroditism is often made by inspection of external genitals. This is confirmed by chromosomal analysis and assays of hormones such as

testosterone. Initial suspicion of female pseudohermaphroditism is also made by inspection of external genitals (Hermaphroditism Information on Healthline 2002).

Freemartinism may be considered as a form of intersexuality and should be considered when diagnosing causes of intersexuality (Hafez et al. 2005).

Hermaphroditism is rare in sheep and is more common in goats than in any other farm animals (Hafez et al. 2005). Previously true hermaphroditism was reported in a lamb (Bunch et al. 1991) and male pseudohermaphroditism was reported at three lambs (Dennis 1979).

In this study a case of male pseudohermaphroditism in a lamb was described with macroscopically and microscopically findings.

MATERIALS and METHODS

An Akkaraman female lamb at 4 months of age, which was euthanized because of right femur fracture was necropsied at Ankara University Veterinary Faculty Department of Pathology. After necropsy all of the organs of lamb were fixed in 10% buffered formalin, and were processed for histological examination by routine methods and embedded in paraffin wax. The sections were cut 5-6 µm in thickness, mounted on glass slides and stained using the hematoxylin and eosin (HE) method.

RESULTS

At macroscopically a pieced fracture was seen at the right corpus ossis femoris of lamb. Lamb was identified as a female based on visual examination of the external genitalia. A vulva and a small clitoris that was protruding from vulvar juncture were seen as an external genitalia organs (Figures 1 and 2). But during necropsy abdominal testes, epididymis like structure were seen as an internal genitalia organs (Figures 1 and 2). The size of the right and left testes was found to be as 2.5x2x0.3 cm and 2x1.9x0.2 cm, respectively. At the upper left of the head we observed a rudimenter horn which was measured as 1.5x0.8x0.4 cm. Microscopically examination of vulval

tissue showed a normal vulval tissue. But testicular tissue consisted of immature seminiferous tubules that were lined with what appeared to be incompletely differentiated Sertoli cells with primitive gamet like cells. An extended interstitial layer with fibrous tissue were observed between these immature seminiferous tubules (Figure 3). Cut sections that were taken from probabaly epididymis, cyclic tubule like structures were seen. In these tubules degenerative and primitive gamet like cells were observed (Figure 4). Many sporocysts of Sarcocystis and mononuclear cell infiltration were seen in heart muscle; and hydrophic degeneration and passive hyperemia was observed in liver.

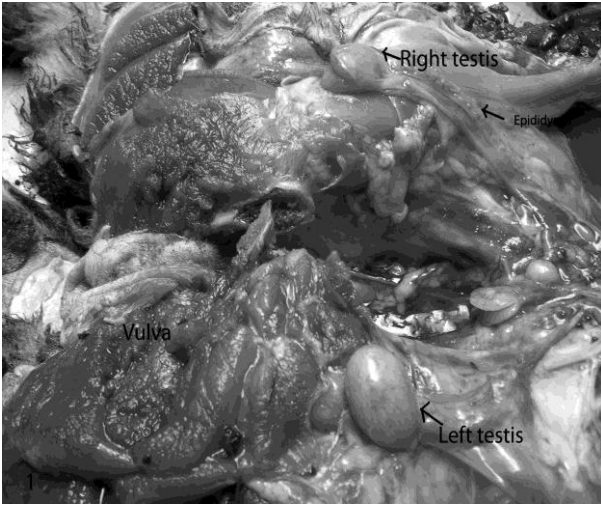


Figure 1. A vulva was seen as an external genitalia and right/ left testes and epididymis were seen as internal genitalia

Şekil 1. Dış enital organ olarak vulva ve iç genital organ olarak sağ/sol testisler ve epididimis gözlenmekte

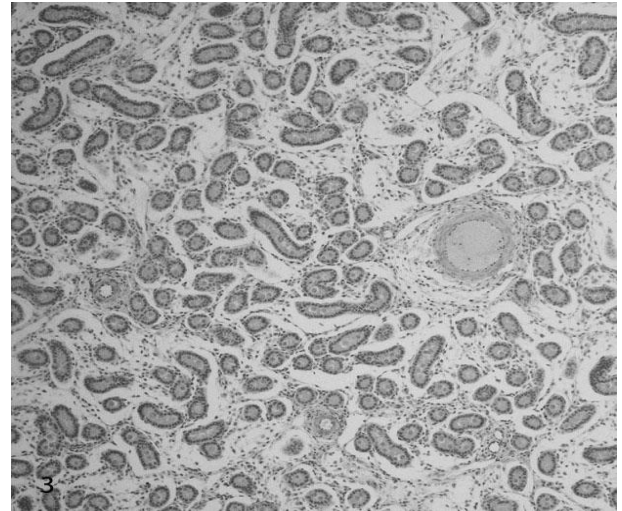


Figure 3. Immature seminiferous tubules with Sertoli like cells, HEX100

Şekil 3. Olgunlaşmamış seminifer tubuller ile sertoliye benzer hücreler, HEX100

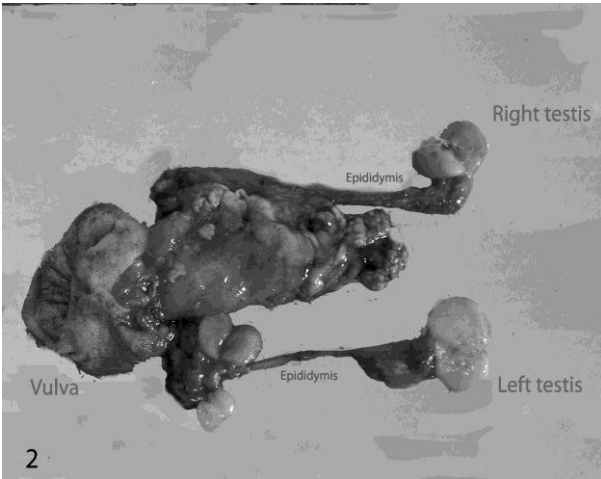


Figure 2. Both vulva, testes and epididymis were seen at lamb as genitalia organs

Şekil 2. Kuzuda genital organ olarak hem vulva, hem de testisler ve epididimis gözlenmekte.

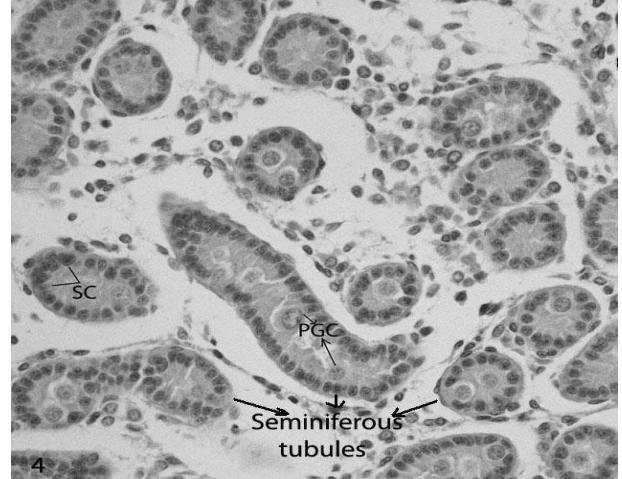


Figure 4. Immature seminiferous tubules were consisted only Sertoli like cells (SC) and primitive gamet like cells (PGC), HEX400

Şekil 4. Olgunlaşmamış seminifer tubuller sadece sertoliye benzer hücreler (SC) ile primitif eşey hücrelerine benzer hücrelerden (PGC) oluşmakta HEX400

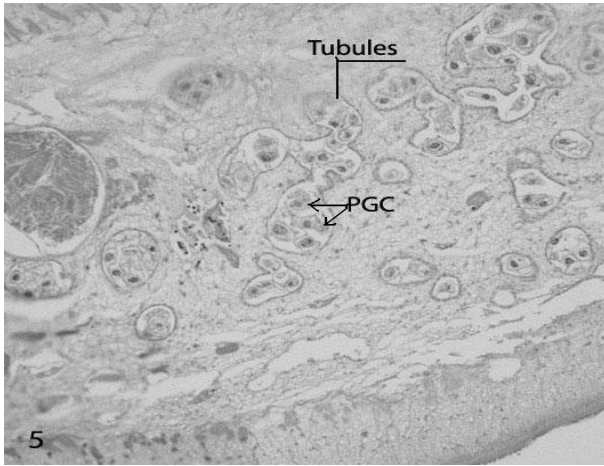


Figure 5. At epididymis like structure, only degenerative and primitive gamet like cells (PGC) were found in tubules, HEX100

Şekil 5. Epididimis benzeri yapıda tubullerin içerisinde sadece dejeneratif ve primitif eşey hücrelerine benzer hücreler (PGC) bulunmakta, HEX100

DISCUSSION

Intersex describes a broad category of genital disorders and abnormalities in which an animal has the genitalia and/or the secondary sex characteristics of both male and female (Kenney et al. 1992). Male pseudohermaphrodites have testes and female external genitalia organs; female pseudohermaphrodites have ovaries and male external genitalia organs (Kennedy and Miller 1993). In our study because of the presence of male gonadal tissues, it is proposed that the lamb was a male pseudohermaphrodite.

At previous studies normally located vulva and a large penis-like clitoris was reported at male pseudohermaphrodites (Baştan et al. 2003, Hafez et al. 2005, Weng et al. 2005). In the study same with these reports normally located vulva and contrary to them small clitoris was observed.

At male pseudohermaphroditism during visual examination of the internal genitalia testes (Hafez et al. 2005, Sysa et al. 1975, Weng et al. 2005), epididymis, vas deferens (Hafez et al. 2005, Sysa et al. 1975) and uterus (Sysa et al. 1975, Weng et al. 2005) can be seen. In our study only testes and epididymis were seen as internal genitalia.

At histological examination of testicular tissue immature seminiferous tubules that were lined with Sertoli cells were observed (Hafez et al. 2005, Weng et al. 2005). In the study additively these similar microscopic findings, we also saw primitive gamet like cells in immature seminiferous tubules. The epididymis was similar in histological appearance to the normal epididymis (Hafez et al. 2005). But in the present study cystic tubule like structures with degenerative and primitive gamet like cells were observed.

Male pseudohermaphroditism has been described in numerous species, including dogs (Alam et al. 2007, Baştan et al. 2003), rats (Goldman et al. 1976), goats (Just et al. 1994), horses (Milliken et al. 1995), and cattle (Sysa et al. 1975). In lambs only one study was reported at three lambs (Dennis 1979). In Turkey male pseudohermaphroditism was reported at one dog (Baştan et al. 2003). Hermaphroditism was reported in two calves and in one lamb (Aksoy et al. 2006) but authors didn't

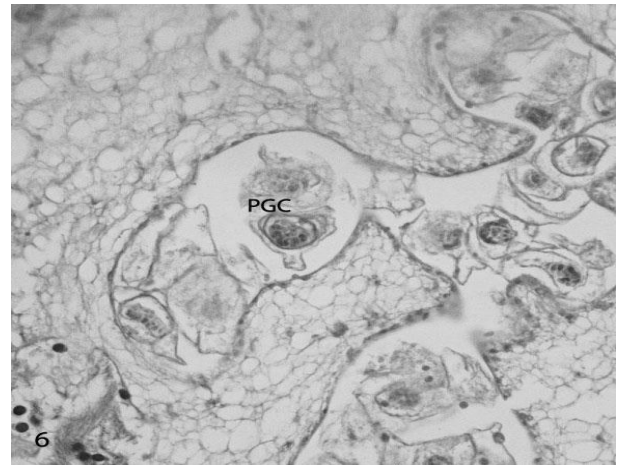


Figure 6. See Figure 5 up close, HEX400

Şekil 6. Şekil 5 in yakından görünümü, HEX400

explain the kind of hermaphroditism. Because of this reason the present report, with the macroscopic and microscopic findings, is the first case of male pseudohermaphroditism in a lamb.

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