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A Rare Clinical Case Of Double Scrotum With Ectopic Testicle In a Dog

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Abstract

A two-years old male mixed breed dog weighing 11 kg was brought to the Veterinary Teaching Hospital by its owner because he noticed a pigmented skin zone with a mass lateral to the penis. The patient was in good clinical condition. On clinical examination, only one testicle was found within the scrotum, and a mass lateral to the right site of the penis was present; upon palpation, the mass was presumed to be a testicle. An ultrasound examination confirmed the presence of an ectopic testicle in that position. The dog had normal fertility and testosterone levels were normal. The patient underwent bilateral orchiectomy and was discharged the following day. The peculiarity of this case is the presence of two independent scrota, an ectopic testicle and its adnexa passing through the abdominal wall, was not supposed to be due a migration along the typical male gonad path during descent.

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Introduction

Cryptorchidism is the most common congenital anomaly of the testicles in human and mammals and it is considered to be hereditary as an autosomal recessive trait. However, some researchers believe that there is a multiple gene effect (1,2,3). A number of breeds are at risk for cryptorchidism, including Boxers, Malteses, Miniature Schnauzers, Siberian Huskies, Old English Sheepdogs, and Yorkshire Terriers (4,5). During late gestation and after birth, the gonads move from the lumbar area, where they originate, to their final location in the scrotum. The testicles are palpable inside the scrotum within 6 to 8 weeks from birth. Testicles that remain inside the abdomen or in the inguinal canal are defined as cryptic, whereas those that reach an abnormal location outside the inguinal ring are considered ectopic (6,7). Other authors however do not distinguish between cryptic and ectopic and non-scrotal testicles which were classified based on the locations: abdominal cavity (abdominal), inguinal canal (canalicular) or outside the abdominal wall (subcutaneous) (8). Similar to humans, unilateral cryptorchidism is more commonly detected in dogs, and the right testicle is affected twice as frequently (7). The undescendent testicle may affect fertility and predispose patients to neoplasm, spermatic cord torsion and inguinal herniation (9). The diagnosis of retained testicles is usually based on palpation (inguinal region, scrotum), but this can be difficult (successful only 48%) (4). Abdominal ultrasound examination is a sensitive technique to visualize retained testicles. In dogs and cats, retained testicles can be located anywhere between the caudal pole of the kidney and the inguinal area (7). An ectopic testicle is usually situated between the inguinal region and the prescrotal area (4). In dogs the right testicle retention is more frequent than in the left site; proportionally 68% of affected dogs show unilateral cryptorchidism and 32% bilateral cryptorchidism (4,7). Right testicle cryptorchidism is more common because of a forward starting position in the abdomen. This article describes an unusual case of an ectopic right testicle with two independent scrota in a dog.

Case Report

A two-years old male mixed breed dog weighing 11kg was brought to our referral teaching hospital by its owner because of a mass located lateral to the right side of the penis under an area of pigmented skin. The patient was in good clinical condition. Clinical examination indicated that the scrotum contained only one testicle, and a testicle-like mass to in right site of the penis was detected by palpation and was covered with a coloured skin, similar to a scrotum (Figure 1).

Figure 1. The right ectopic testicle is visible lateral to the penis with its independent scrotum.

The testicle inside the scrotum was the left one because pushing it back it went up along the left inguinal canal. A blood sample was collected from the cephalic vein for haematological, biochemical and hormonal profiling, and semen was collected for a spermiogram. The semen was collected by manual ejaculation and the analysis was performed according to Root Kustritz (2007). The volume was 4 ml with milky color and pH 6.6; the total number of spermatozoa was 400 million (100 million /ml) with 80% progressive motility and 80% morphologically normal. For the concentration assessment traditional technique with Burker chamber has been used. Ultrasound examination by means of a 7.5 Mhz probe (MyLab, Esaote Firenze, Italy) confirmed the presence of an ectopic testicle. This testicle had a uniform echogenic aspect, in the middle was clearly present a linear hyperechoic structure identifiable as the mediastinum testis, like in the normal testicle. Moreover an epididymis with phisiological blood flow was detected by Doppler. Surgery was performed to remove both testicles. Atropine sulphate (0.05 mg/kg; Atropina solfato®, Ati, Italy) and butorphanol (0.2 mg/kg, Dolorex® -MSD Animal Health, Germany) were administered as premedication, followed by general anaesthesia induced with propofol (4 mg/kg, Proposure® -Merial, Italia) and maintained with 1.5% isoflurane (Isoflo®- Esteve, Portugal) in oxygen. Cefazolin (15 mg/kg, Cefazolina Teva®, Milano Italy) and robenacoxib (2 mg/kg, Onsior® - Novartis, UK) were administered at the time of induction. Two incisions, lateral and caudal to the penis, were made using a standard orchiectomy technique. Amoxicillin 10 mg/kg and clavulanic acid 2.5 mg/kg (Synulox® Pfizer, Roma, Italy) q12hr OS were administered every 12 hours for 7 days as postoperative treatment. Haematological and biochemical values were within normal ranges, including

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testosterone level of 2.8 ± 0.3 ng/ml (three samples were collected during 24 hours (at 8.00 a.m., 2.00 p.m., 8.00 p.m.) and the test was repeated after 4 days (12,13). The dog had coupled only once and pregnancy has produced four puppies. After surgical excision, the testicles were macroscopically evaluated, width and length were measured and the size proved to be normal based to the subject's size (14). Then they were fixed in 10% neutral buffered formalin for 72 hours. The testicles were cut into several longitudinal slices approximately 0.5 cm thick. Several transverse sections of the spermatic funicles were also cut for the histological evaluation. The sections showed that both testicles had a complete tunica albuginea, epididymides, vessels, muscles and deferent ducts. The testicular parenchyma structures (seminiferous tubules and interstitial tissue) appeared normal. Mediastinum testis and fibrous bands were centrally visible and ran radially from the mediastinum to separate the parenchyma in lobules. About the second scrotum (that covered the ectopic testicle) it was already possible to state macroscopically its nature (skin thin, elastic, highly mobile, unctuous with thin and sparse hairs) (14), but the definitive evidence was given by histological examination. The second scrotum was fixed by immersion in 4% buffered formalin solution for 48 hours; after dehydratation and paraffin embedding histological sections 5 µm thick were obtained. They were subsequently stained with hematoxylin-eosin. Histological examination showed the epidermis composed of a few layers of epithelial pigmented elements. The derma, characterized by collagen and elastic fibers, and showed few hair follicles, sweat and sebaceous glands annexed with even bundles of smooth muscle cells. Moreover, the deep derma appeared in close relationship with the skin owing to the presence of bundles of smooth muscle cells and elastic and collagen fibers; therefore the whole of it was similar to Dartos (Figure 2 A,B).

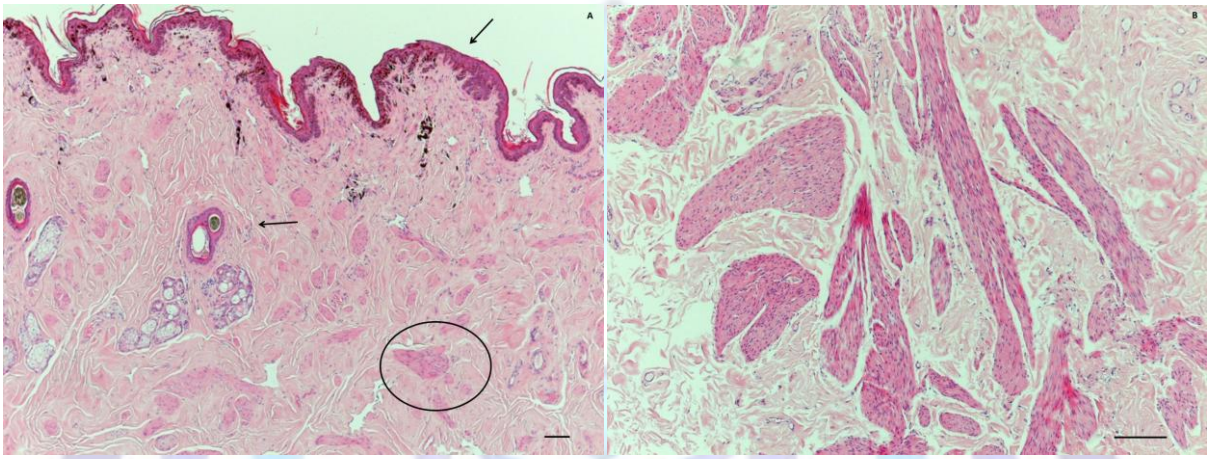

Figure 2. A: In section 4x is shown pigmented skin (arrow at the top); derma with few piliferous structures and sebaceous and sweat glands (arrow at the bottom); numerous bundles of smooth muscle cells, mixed with elastic fibers and collagen, infiltrate and support the deep derma (circle). B: In section 10x is shown the presence of bundles of smooth muscle cells similar to those present in the dartos.

Histology has clearly identified the presence of scrotal tissue layer. On the second day after surgery, the dog was discharged from the hospital. One week later, the owner reported that the dog had recovered completely.

Discussion

Typically retained testicles lack spermatogenesis and have an increased risk of tumour development, in our case it did not show any degeneration form (15). Retention of the testicles in subcutaneous areas or in the abdomen may contribute to the development of neoplasms. The descent of the testicles, epididymides and spermatic cords is a complex series of events that occur under hormonal and nervous control. This process occurs in three main phases: transabdominal migration, the intra-inguinal and the extra-inguinal migration (15). Testicular differentiation occurs from 36th day onward in canine gestation. The first hormone produced by the embryonic testicle is the Müllerian inhibiting substance (MIS), which causes regression of the female tubular system in a male foetus. The embryonic testicle produces testosterone, which promotes the development of the remaining male tubular tract, the prostate gland, penis and external genitalia. Furthermore in many species of eutherian mammals (humans included), testosterone stimulates development of the genitofemoral nerve, which is required for normal testicular descent to begin (8,16). A sex-determining gene (SRY) must be present only on the Y chromosome. If the SRY gene is present, the testicles will develop and the foetus will be a male.

Ultrasonographic examination can be useful for detecting nondescendend testicles and testicular neoplasia (17). Ultrasonographic detection of retained testicles has an 88% sensitivity, a 100% specificity and a 91% accuracy (4). Recognition of the mediastinum testis is helpful when trying to distinguish retained testicles from other organs, such as lymph nodes. In our case, the dog had normal development of the external genitalia, and the descent process of the testicles was complete; however, one testicle was ectopic and located lateral to the penis and had an independent scrotum, a complete tunica albuginea, epididymis and deferent duct (Figure 3).

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Figure 3. Surgical procedure for the right ectopic testicle, all the adnexa are present.

The peculiarity of this case is related to the presence of the two independent scrota containing a testicle each. This case demonstrated a very unusual ectopic site for a retained testicle; where the testicle with its adnexa has probably gone through the abdominal wall lateral to the penis, and has not passed through the typical path, i.e. inguinal ring. It is clear that the pathogenesis of this malposition could not be certainly determined, however we hypothesized that this situation could not be due to a migration along the male gonad path during organogenesis, but something might have happened during gestation or birth, such as a trauma allowing the retained testicle to migrate outside the abdominal wall. No traumatic events were reported by the owner, which did not allowed an invasive surgery with exploration of the abdomen. Therefore it has not been possible to investigate further about the descent of the testicle. To the Author's knowledge this case reported an undescribed clinical case regarding the position of an ectopic testicle with the formation of two independent scrota; moreover we could postulate that when we are trying to find an ectopic testicle we should be aware to look also for a different position than those reported in literature.

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