



RESEARCH ARTICLE

Ultrasonographic Diagnosis of Some Scrotal Swellings in Bulls

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ABSTRACT

Information regarding the use of ultrasonography in the diagnosis of testicular and scrotal affections is scarce in bovine. In the present study, eight bulls suffering with scrotal swellings were examined ultrasonographically. The recorded affections included; ruptured urethra with scrotal swelling, testicular hypoplasia, malignant Sertoli cell neoplasm, hydrocele and scrotal hernia. In case of ruptured urethra, the scrotum appeared as thick hyperechoic skin, the testes showed normal echogenicity and the surrounding tissue showed diffuse anechoic areas separated by hyperechoic threads. The hypoplastic testis was less echogenic, and its rete testis was more echogenic, than the normal one. The neoplastic testis had several anechoic areas, hyperechoic masses and areas of normal testicular echogenicity. In hydrocele, the scrotal skin appeared as clear hyperechoic line with anechoic fluid accumulated in the vaginal cavity of the scrotum and both testes had normal echotexture. In scrotal hernia, a hyperechoic omental loop was seen adjacent to high echogenic testis. In conclusion, ultrasonography is a good tool for differential diagnosis of different scrotal swellings in bulls.

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INTRODUCTION

Despite the fact that ultrasonography has been used extensively for the diagnosis of several types of testicular and epididymal affections in human, relatively little literature is available in veterinary practice (Kim *et al.*, 2012; Enginler *et al.*, 2012). The echotexture of both normal and diseased testes and epididymides have been described in bulls (Eilts and Pechman, 1988).

Various affections of the scrotum and its contents were diagnosed ultrasonographically as sperm granuloma and scrotal hernia in rams (Ahmad *et al.*, 2000), scrotal hydrocele (Shore *et al.*, 1995), sac like formation in the tunica vaginalis (Chacon and Berocal, 2010), sertoli cell tumor (Jensen *et al.*, 2008) and epididymal head cyst (Williams *et al.*, 2010) in bulls. Most of the scrotal swellings affect the bull fertility by various degrees which badly reflect on animal reproduction (Van Camp, 1997).

Scrotal swellings may be originated from the scrotum itself or from its contents; differential diagnosis of these swellings by physical examination seems difficult. The aim of the present study was to record the ultrasonographic findings of some scrotal swellings in bulls which could help in the differential diagnosis and prognosis of these affections.

MATERIALS AND METHODS

In the present study, eight bulls were admitted to the surgery clinic at the Faculty of Veterinary Medicine, Cairo University, Egypt, with various scrotal swellings during the period between June 2008 and July 2011. These bulls were of different ages, weights and breeds. Complete case history and physical examination were carried out for each case.

Scrotal ultrasonographic examination was done for all bulls using Toshiba ultrasound device connecting with 3.5-5.0 MHz convex transducer. The examined area was shaved and ultrasound coupling gel was applied. The scrotum and its contents were scanned in both sagittal and transverse planes (Eilts and Pechman, 1988). Open castration was carried out in one bull with suspected testicular tumor and the histopathological examination of the neoplastic testis was carried out as usual.

RESULTS

Ruptured urethra with scrotal swelling (4 cases): It was recorded in four bulls with signs of urine retention for 3-5 days. Diffuse scrotal swelling and cellulitis in the

surrounding area were seen. Ultrasonographically, the scrotum appeared as thick hyperechoic skin and the testes showed normal echogenicity (Fig. 1a). The surrounding tissue showed diffuse anechoic areas separated by hyperechoic threads (Fig. 1b). The urethral calculi could be seen as rounded, smooth hyperechoic masses with distant shadowing (Fig. 1c) at various sites on the penile urethra distal to the sigmoid flexure. Also the site of the urethral rupture could be seen with distant anechoic area (Fig. 1d).

Testicular Hypoplasia (one case): It was seen in a 16-month-old Friesian bull which showed asymmetric scrotum. Physical scrotal examination revealed unequal size of both testes. The left testis was smaller and firmer than the right one. No pain was detected in any testis. Scrotal asymmetry was seen. On ultrasonographic examination, the left testis was 63.5 x 22 mm, while the right one was 80.1 x 43.6 mm (Fig. 2a). The left testis was less echogenic than the right one and the left rete testis was more echogenic (2.2 mm) than the right one (1.8 mm; Fig. 2b).

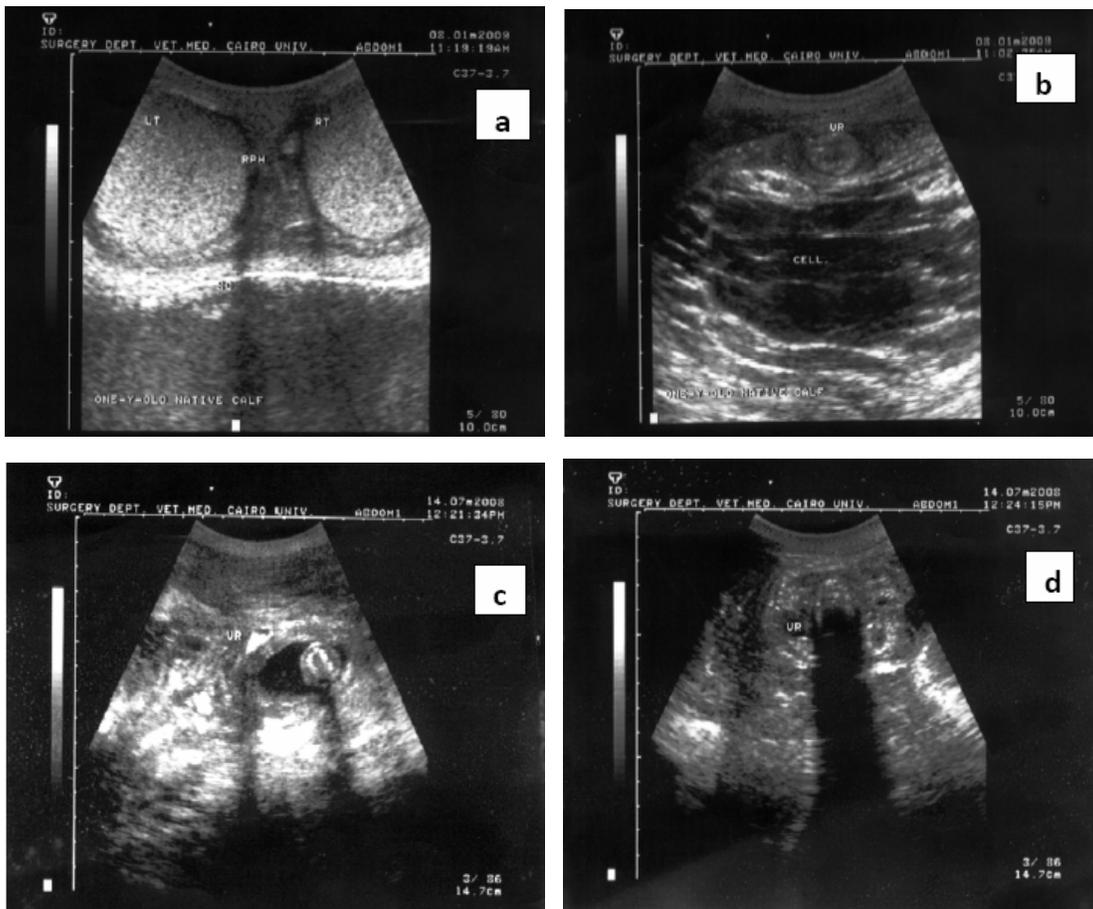


Fig. 1: Urethral rupture with scrotal swelling. Scrotal ultrasonogram showing thick hyperechoic skin and normal echogenic testes (a); The surrounding tissue showed diffuse anechoic areas separated by hyperechoic threads (b); Ultrasonogram showing rounded, smooth, hyperechoic urethral calculus with distant shadowing (c); Ultrasonogram showing the site of the urethral rupture with distant anechoic area (d).

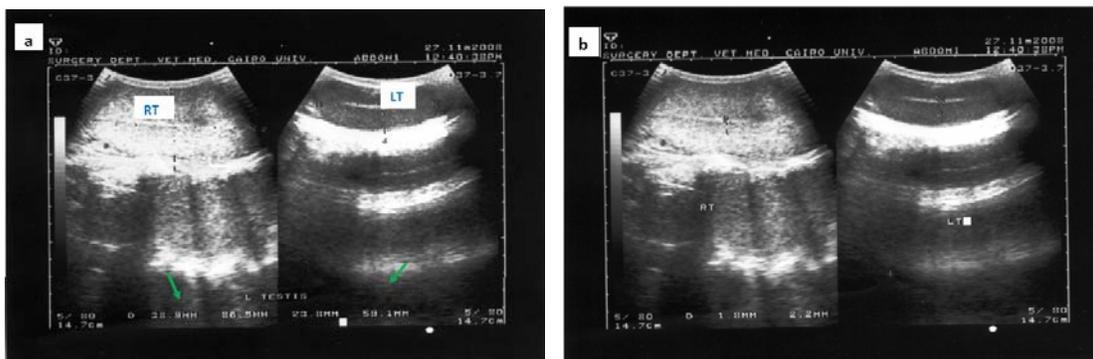


Fig. 2: Trans-scrotal ultrasonogram of left testicular hypoplasia. Notice, the left testis is smaller than the right one (a). The left testis is less echogenic than the right one and the left rete testis is more echogenic than the right one (b).

Malignant Sertoli cell neoplasm (one case): It was recorded in a 5-year-old native bull which was admitted with unilateral scrotal painful swelling for the last 2 months. The affected testis was painful, hot, lobulated and firm on palpation. Asymmetric scrotum with normal skin was seen. Trans-scrotal ultrasonography revealed mixed echogenic testis. The affected testis had several anechoic areas, hyperechoic masses and areas of normal testicular echogenicity (Fig. 3).

On sectioning, the testicle showed areas of necrosis, hemorrhage, and mineralization. Histology showed well differentiated elongated Sertoli cells with multiple nuclei. The cells were arranged in tubular structures surrounded by dense fibrous stroma replacing normal testicular tissue (Fig. 4).

Hydrocele (one case): It was recorded in a 3-year-old Friesian bull suffering with bilateral fluctuating scrotal swelling without pain for one month. Ultrasonographically, the scrotal skin appeared as clear hyperechoic line with anechoic fluid accumulated in the vaginal cavity of the scrotum and both testes had normal echotexture (Fig. 5).

Scrotal hernia (one case): It was seen in a 16-month-old native bull with congenital left unilateral scrotal swelling. The swelling was doughy, painless and reducible. There was asymmetric scrotum. Ultrasonographically, a hyperechoic omental loop was seen adjacent to the left testis and the left testis was smaller and more echogenic than the right one.

DISCUSSION

Although ultrasonography is a good tool for diagnosis of several surgical affections in the veterinary practice, its use in differential diagnosis of scrotal swellings is scarce in bulls. Ruptured urethra commonly occurs at the penile urethra due to urethral calculi leading to ventral rupture of the urethra distal to the sigmoid flexure in bulls (Wolfe *et al.*, 1987). Ultrasonographically, the scrotum appeared thick due to inflammation and indurations of the skin by the escaped urine. The surrounding tissue of the genitalia appeared as a network of anechoic areas representing the urine and hyperechoic threads representing the fibrin which represent the reaction of the body toward the irritation of urine. Also the site of urethral rupture could be seen as area of discontinuity in the urethral tract. The calculi appeared as hyperechoic masses due to their mineral contents.

Testicular hypoplasia is a congenital affection which usually affects the left testis and appears at puberty. The affected testis appeared smaller and more echogenic than the normal one. Borel *et al.* (2007) reported similar findings and added that testicular hypoplasia is possibly linked with bovine diarrhea virus infection.

Although tumors are rare in the bovine testes, the present study recorded a case of Sertoli cell neoplasm. Ultrasonographically, there were severe changes in the affected testis with loss of homogeneity. Anechoic areas represented the accumulated testicular fluid, while the hyperechoic areas represented the calcified tissues. Similar findings were mentioned by Jensen *et al.* (2008).

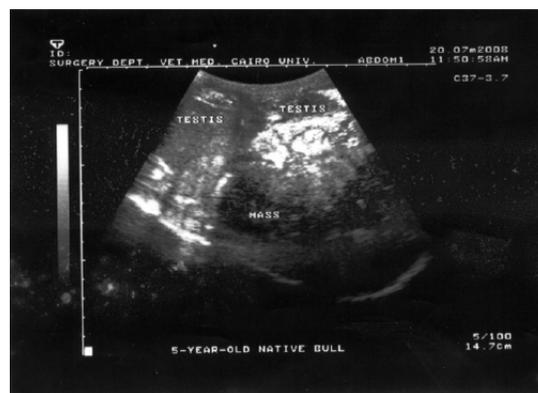


Fig. 3: Trans-scrotal ultrasonogram of neoplastic testis showing mixed echogenicity. Note, several anechoic areas, hyperechoic masses and areas of normal testicular echogenicity.

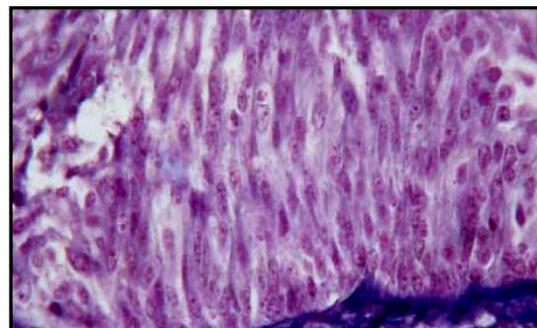


Fig. 4: Sertoli cell neoplasm showing well differentiated elongated cells with multiple nuclei (malignancy) (H&E X 400).

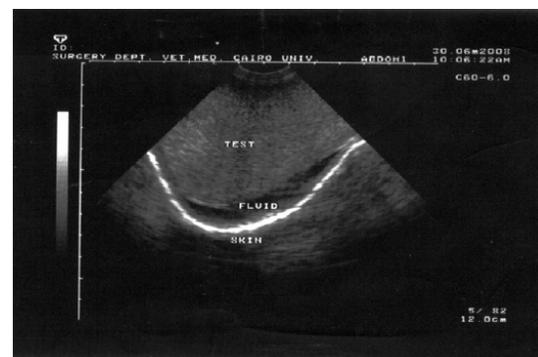


Fig. 5: Scrotal ultrasonogram showing clear hyperechoic skin with anechoic fluid accumulated in the vaginal cavity (Hydrocele) and normal testicular echotexture.

Scrotal hydrocele in mature bulls is caused by accumulation of fluid in the scrotal vaginal cavity without evidence of local inflammation or traumatic lesions (Abbitt *et al.*, 1995). This accumulated fluid in the scrotal vaginal cavity appeared as anechoic area surrounding the testis and made the scrotal skin more echogenic.

Scrotal hernia is a congenital or acquired affection of bulls and the omentum and small intestines are the most common herniated viscera (Hyorth, 2011). The testis of the affected side undergoes degeneration due to pressure atrophy and high temperature of the herniated viscera. Therefore, the affected testis appeared smaller and more echogenic than the normal testis.

In conclusion, ultrasonography is a good tool for differential diagnosis of different scrotal swellings in bulls.

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