

*Clinical Report*

## Unilateral Orthotopic Ureterocele in a Dog

**Fatemeh Neshat Halati, DVM**  
**Mohammad Molazem\*, DVSc**  
**Shaghayegh Asadi, DVM**  
**Majid Masoudifard, DVSc**

*Department of clinical science, Faculty of Veterinary Medicine,  
University of Tehran, Tehran, Iran.*

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### Abstract

**Case Description:** A ten-year-old neutered female terrier dog was referred to the Tehran-Azma Veterinary Diagnostic Center for history of too late recovery too late after ovariohysterectomy.

**Clinical Finding:** Blood chemical laboratory tests revealed high serum BUN, maximum concentration of creatinine and decreased of serum albumin. Sonographically, there was an anechoic cyst-like structure in the right side of the bladder trigone. The abnormality appeared to be a “cyst within a cyst”, which is a characteristic ultrasonographic feature of ureterocele in humans.

**Treatment and Outcome:** The case referred to surgery section and underwent total right kidney dissection and ureterocele tearing.

**Clinical Relevance:** An ureterocele is a congenital cystic dilation of the submucosal portion of the distal ureter and ultrasonography is a useful means of diagnosis of urogenital disease and disorders.

**Key Words:** Ureterocele, Ultrasonography, Dog

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### Case Description

An Iranian cross-breed goat-kid (3-months-old) was referred to veterinary clinic with a history of anorexia, teeth grinding and bleeding from the mouth. The animal was kept under traditional condition.

A ten-year old neutered female terrier dog was presented to the Tehran- Azma Veterinary Diagnostic Center with history of recovery too late after ovariohysterectomy. Blood chemical laboratory tests revealed high serum blood urea nitrogen (86.9; reference range, 10 to 28

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**\* Corresponding author:**

Mohammad Molazem, DVM, DVSc  
Department of Clinical Sciences, Faculty of Veterinary Medicine,  
University of Tehran, Tehran, Iran.  
E-mail address: mmolazem@ut.ac.ir

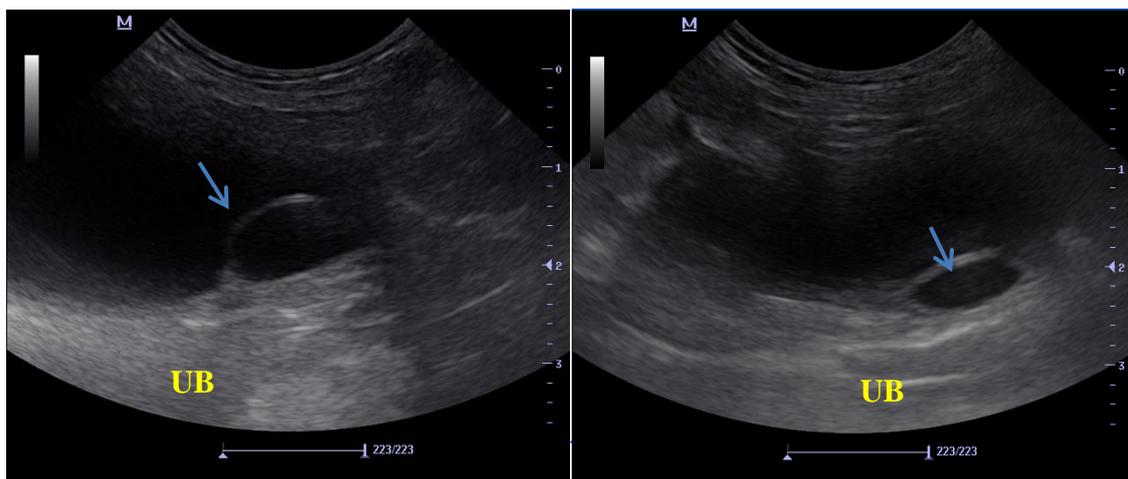
mg/dl), maximum concentration of creatinine (1.5; reference range, 0.5 to 1.5 mg/dl) and decreased of serum albumin (2.75; reference range, 3 to 6 mg/dl). Abdominal ultrasonography was performed using Mindray M5-vet ultrasound machine by 6\_8 MHz micro convex transducer. Left kidney was more than normal limited and contained several cysts within its cortex but the right kidney was smaller than normal limits (Fig. 1).



**Figure 1.** Sagittal ultrasonogram of both kidneys that reveals small size of the right kidney (left fig) and presence of cysts within cranial pole of the left kidney (right fig).

A small, thin and three layer-walled, round structure containing anechoic fluid with distal acoustic enhancement was noted in right side of the bladder trigon (fig.2). The size and location of the defect was consistent with the ultrasonographically detected orthotopic cyst-like structure.

A tentative diagnosis of unilateral orthotopic ureterocele with end-stage right kidney was made.



**Figure 2.** Sagittal (a) and transverse (b) sonogram of the urinary bladder (UB). The ureterocele (arrow) can be seen protruding into the urinary bladder caudodorsaloleft laterally.

## Treatment and Outcome

The case referred to surgery section and underwent total right kidney excision and ureterocele tearing. The case was clinically improved and no sign for urinary incontinence was detectable after two months follow up.

## Discussion

An ureterocele is a congenital cystic dilation of the submucosal portion of the distal ureter.<sup>19</sup> Ureteroceles are classified into two types: orthotopic or intravesical and ectopic, according to location of the ureterocele and ureteral orifice.<sup>6,8,18</sup> Ectopic ureteroceles tend to present with urinary incontinence, and patients with ureteroceles often have a history similar to those with ectopic ureters.<sup>8,11</sup> Patients with intravesical ureteroceles can have a variable presentation, including incontinence, dysuria, hematuria, chronic urinary tract infections, and complete or partial urinary obstruction; however, intravesical ureteroceles are often incidental discoveries with no associated signs.<sup>11</sup>

The etiology of ureterocele is unknown, however, there are several theories concerning embryogenesis including:

- 1) Persistence of Chwalle's membrane, an epithelial spur membrane in the embryo which separates ureter from common excretory duct;
- 2) Ureteral dilatation secondary to ureteral obstruction caused by stenosis of the ureteral orifice;
- 3) The stimulus of dilatation of the vesicourethral canal affects on the ureteral end;
- 4) arrested myogenesis of the distal ureter.<sup>17, 21</sup>

Orthotopic ureteroceles, also referred to as intravesicular, are dilations of the submucosal segment of the distal ureter that projects completely into the lumen of the urinary bladder.<sup>3</sup> Orthotopic ureteroceles have an orifice that communicates with the urinary bladder. Ectopic ureteroceles are associated with ectopic ureters and thus are located in the urethra or neck of the urinary bladder.<sup>3</sup> Ureteroceles can also be classified based on their function; this may be useful in providing prognostic information.<sup>18</sup>

- ✓ Grade 1—No concurrent ureteral or renal disease
- ✓ Grade 2—Unilateral ureteral or renal disease
- ✓ Grade 3—Bilateral ureteral or renal disease

In this report, not only there was an ureterocele in the bladder trigon, but also failure in the function of right kidney and compensatory hydrotrophy in the left kidney was occurred which are indicative for grade 2.

Complications of ureteroceles include hydronephrosis, infection, calculus formation, urinary incontinence, and obstruction of the bladder neck or urethra<sup>5</sup>; however, patients with orthotopic ureteroceles are often asymptomatic unless the ureterocele is large enough to cause outflow obstruction and hydronephrosis.<sup>8, 12, 18</sup>

Diagnostic tests available to determine include blood tests, urinalysis and urine culture, plain and contrast radiography, ultrasonography, cystoscopy, computed tomography (CT), surgical exploration, or a combination of these tests. Surgery is the treatment of choice for ureteroceles.<sup>2, 12</sup>

Ultrasound has been suggested and utilized as a means of evaluating human patients suspected of having a ureterocele<sup>9,10,16</sup> and has benefits in investigating the upper urinary tract.<sup>13,14</sup> It provides information on the size, shape, and internal architecture of the kidneys.<sup>14,15</sup>

Ultrasonographically, ureterocele are usually smooth, round, thin walled, cavitory, or cystic structures that contain anechoic fluid.<sup>1,7,18,20</sup> In human patients the sonographic ureterocele appearance has been described as a cyst within a cyst.<sup>4</sup> Communication between the distal ureter and the cystic structure can sometimes be seen ultrasonographically.<sup>7,18,20</sup>

In the dog reported here which is the first report of ureterocele in Iran, the cause of the ureterocele was not determined. A congenital asymptomatic ureterocele may have existed before clinical disease. Continued enlargement of the ureterocele might have caused obstruction of the right ureter, hydronephrosis and finally failure in the function of the right kidney and leading to increased of serum BUN, maximum concentration of creatinine and too late recovery.

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یورتروسل یک طرفه در یک قلاده سگ

فاطمه نشاط حالتی، محمد ملازم\*، شقایق اسدی، مجید مسعودی فرد

<sup>1</sup> گروه علوم درمانگاهی، دانشکده دامپزشکی دانشگاه تهران، تهران، ایران

**توصیف بیمار و یافته های بالینی:** یک قلاده سگ تریر ماده ۱۰ ساله با این علامت که بعد از جراحی برداشت رحم و تخمدان دیر به هوش آمده بود، به مرکز تشخیصی خصوصی تهران آزما مراجعه کرده بود. آزمایشات خونی حیوان نشان داد که BUN و کراتینین خون افزایش پیدا کرده و آلبومین سرم کم شده است. در سونوگرافی یک توده آن اکوئیک کیست مانند در سمت راست trigon در مثانه دیده شد.

**درمان و نتیجه آن:** حیوان مورد جراحی قرار گرفت و کلیه راست برداشته شد و همچنین توده کیست مانند داخل مثانه پاره گردید.

**کاربری بالینی:** یورتروسل یک بیماری مادرزادی در قسمت زیرمخاطی میزنا می باشد که اولتراسونوگرافی یک روش تشخیصی مناسب برای این عارضه است.

**کلید واژگان:** یورتروسل، اولتراسونوگرافی، سگ.