

## Case Report

# Calculi in lower aplastic ureter with ipsilateral agenetic seminal vesicle opening to mimicking seminal vesicular calculi: a case report

Wensu Wei<sup>1\*</sup>, Fei Deng<sup>1\*</sup>, Zhi Long<sup>1,2</sup>, Yingbo Dai<sup>1,2</sup>, Jingchao Wei<sup>1</sup>, Liuxun Li<sup>1</sup>, Leye He<sup>1,2</sup>

<sup>1</sup>Department of Urology, The Third Xiangya Hospital of Central South University, Changsha, Hunan, P. R. China;

<sup>2</sup>Institute of Prostate Disease, Central South University, Changsha, Hunan, P. R. China. \*Equal contributors.

Received September 6, 2015; Accepted November 23, 2015; Epub January 15, 2016; Published January 30, 2016

**Abstract:** Unilateral renal aplasia (URA), which belongs to congenital solitary functioning kidney (CSFK), may lead to renal failure in patient's later life. URA is often associated with other malformations, among which urological anomalies are the most common ones. Herein, we present a case of a 52-year-old man with the left URA and aplastic ureter with ipsilateral seminal vesicle opening to (AUISVO). The stone in the lower aplastic ureter resembled seminal vesicular calculi in imaging features, which resulted into the initial misdiagnosis. This indicates that the aplastic ureteral calculi must be taken into consideration when patients with CSFK are presented with symptoms and imaging characteristics of seminal vesicular calculi. To our best knowledge, this is the first case that the lower ureteral calculi in AUISVO imitates seminal vesicular calculi.

**Keywords:** Unilateral renal aplasia, aplastic ureter, ectopic seminal vesicle opening, calculi, misdiagnosis

## Introduction

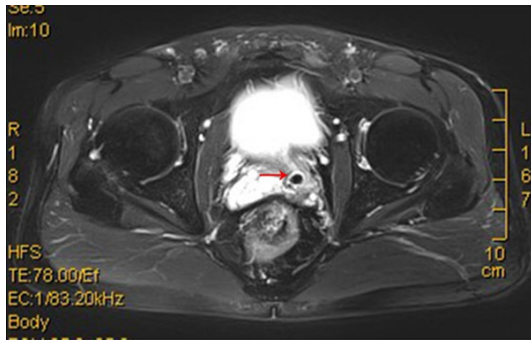
URA, occurring at a frequency of 1/1100 births, is the dominating cause of CSFK, which can lead to renal failure in adults [1, 2]. The coexistent anomalies mainly locate in the urinary tract, such as vesicoureteral reflux and ectopic ureter [3]. Agenetic seminal vesicle, which is a rare associated anomaly, may open to the ipsilateral aplastic ureter to generate AUISVO. In the present case, an initial misdiagnosis of the left seminal vesicular calculi was made in a patient of AUISVO with the left lower ureteral calculi because of its aspecific clinical and imaging features.

## Case presentation

A 52-year-old man was admitted to the Department of Urology, The Third Xiangya Hospital of Central South University (Changsha, China) with progressive perineal pain aggravated after walking and dysuria urodynia for 4 months. His past history showed that he had bladder cyst and received bladder cyst resec-

tion 19 years ago. Anamnesis also revealed that he suffered a chest trauma that resulted in multiple ribs fracture 5 years ago and recovered completely. On digital rectal examination, a firm mass was felt left anteriorly, which could lead to severe perineal pain when the mass was pressed. His prostate-specific antigen was normal and urinalysis showed 1+ protein and 601 white ball cells.

Pelvic magnetic resonance imaging (MRI) revealed the left seminal vesiculitis and the left seminal vesicular calculi (**Figure 1**). On contrast-enhanced computed tomography (CT), the absence of the upper urinary tract and the seminal vesicular calculi were showed on the left (**Figure 2A, 2B**). Besides, transabdominal and transrectal ultrasonography also revealed the left seminal vesicular calculi. However, further examination of the CT scan indicated that the seminal vesicle was connected with the bladder (**Figure 2C**). In view of the above-mentioned clinical and radiological findings, an initial diagnosis of the left seminal vesicular calculi was made.



**Figure 1.** Pelvic Magnetic resonance imaging. The arrow indicated the lower ureteral stone appearing to be the seminal vesicular calculi.

Cystoscopy and seminal vesiculoscopy were planned to remove the left seminal vesicular calculi. However, cystoscopy revealed a wide opening of the left ureteral orifice and a 1.5\*1.0\*1.0 cm stone in the opening intraoperatively (**Figure 3A**). Subsequently, ureteroscopy was performed and showed a left hypogastric ureter measuring about 7 cm in length and the left hypoplastic renal pelvis (**Figure 3B**). The left seminal vesicular opening showed up on the right lateral wall of the lower ureter after the calculi was removed with holmium laser endoscopically (**Figure 3C**). Then, the left seminal vesicle was revealed after the ureteroscopy passed through the opening (**Figure 3D**). Finally, seminal vesiculoscopy was done to show no sign of the normal left ejaculatory duct. After the surgery, cystourethrography was arranged to show the extent of vesicoureteric reflux on the left and radiorenogram was also done to show the non-function of the aplastic left kidney (**Figure 4**). His perineal pain disappeared 1 day after the surgery, the patient was discharged without any complication 5 days later and the follow-up is now in procedure.

### Discussion

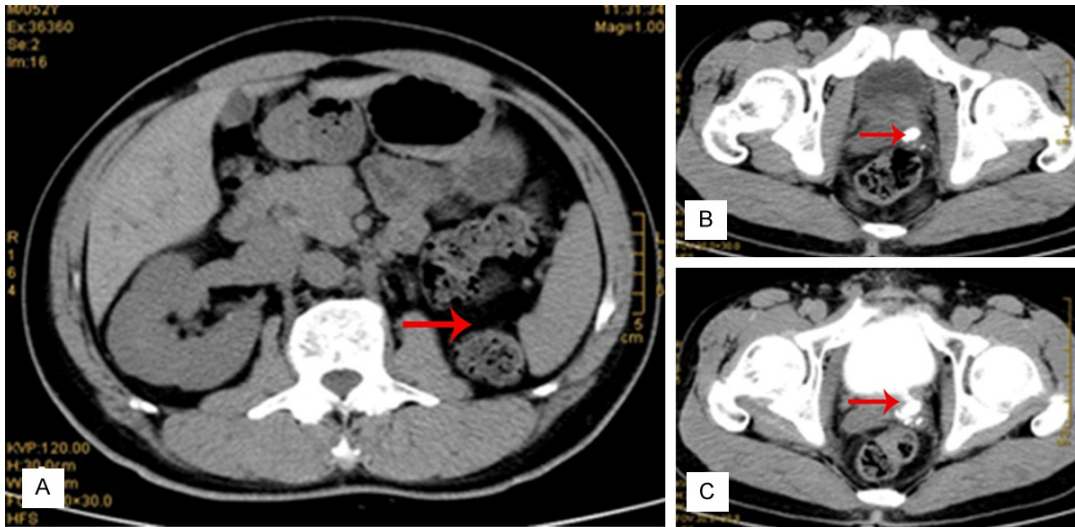
URA is a rare condition associated many other anomalies, among which urologic deformities account for the most frequent ones [3]. Seminal vesicular anomalies with URA are abundantly reported in the literature, while AUISVO with URA has never been mentioned [4, 5]. However, sufficient evidences can be found in embryogenesis for the forming mechanism of AUISVO with URA. Normally, between weeks 4 and 7 of gestation, the ureteral bud burgeons from

mesonephric duct and enters the metanephric blastema to form the kidney and ureter [6]. It is reported that the dysplastic kidney and ureter would be generated if the ureteral bud formed too early and migrated too cranially [6]. At the same time, the proximal vas precursor (PVP) of the mesonephric duct reaches the vesio-urethral canal at the point of the seminal crest to produce the ejaculatory duct, the seminal vesicle and part of the deferent duct [7]. The ejaculatory duct would open to the urinary tract if the PVP intruded into the common mesonephric duct (CMD), which forms bladder trigone [7]. The location of the ectopic orifice, which may appear at any position from the posterior urethra to the renal calyx, is decided by the intruded site of the PVP [7]. All in all, any factor that could influence the embryogenesis during weeks 4 and 7 of gestation may lead to AUISVO with URA.

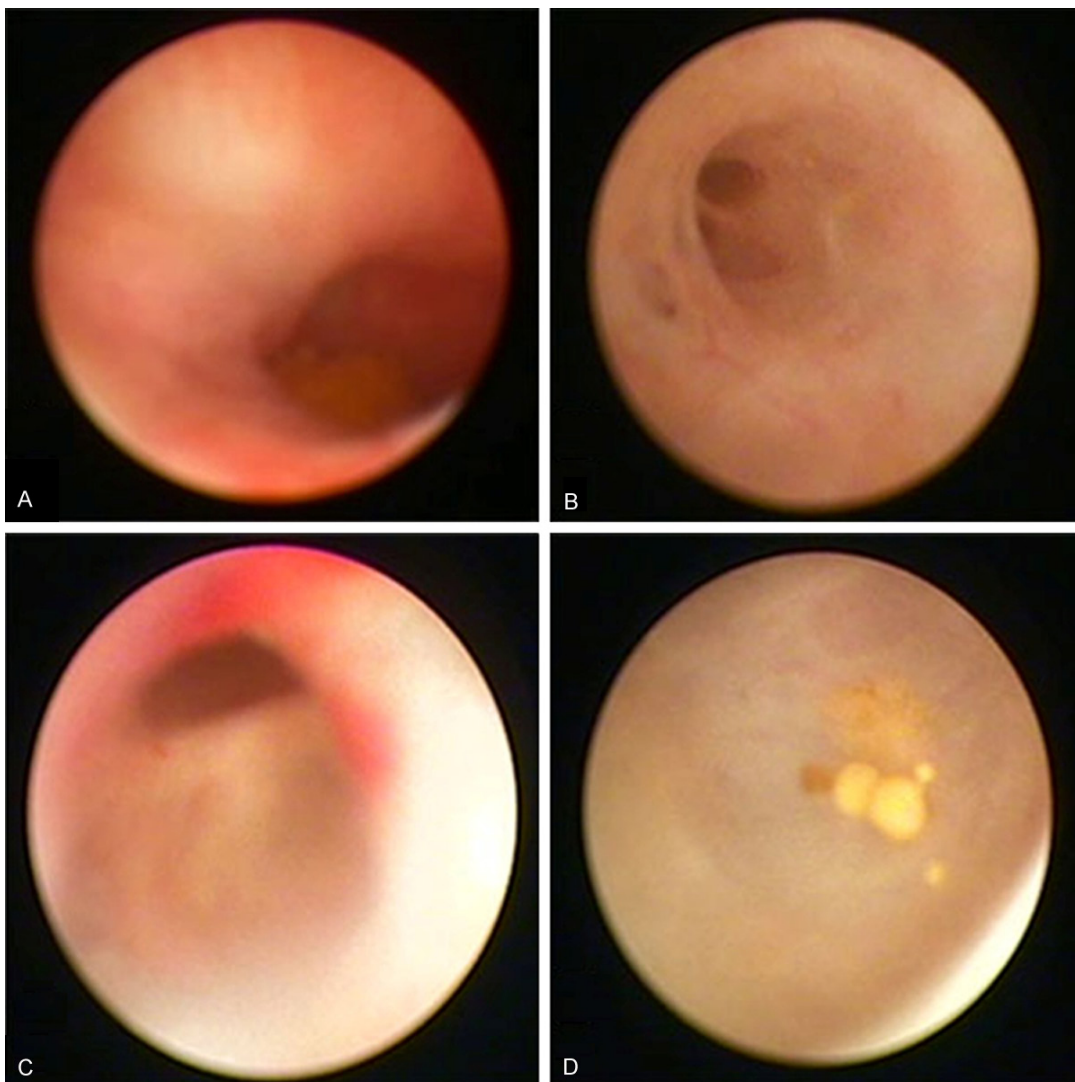
The lower ureteral calculi in AUISVO can be easily misdiagnosed because of its unspecific symptoms and imaging features. The patients are often presented with pelvic and perineal pain, accompanied by an anterolateral hard mass on digital rectal examination. Imaging examination, including pelvic MRI and CT, could be misleading, since the imaging features resemble seminal vesicular calculi. The differential diagnosis includes prostatitis, prostate cancer, Zinner syndrome, seminal vesicular calculi and so on. Cystourethrography is a sensitive method to show the aplastic upper urinary tract and the agenetic seminal vesicle because of the presence of vesicoureteral reflux, which may cause lithogenesis in the lower ureter. The most valid way to diagnose the lower ureteral calculi in AUISVO is ureteroscopy and seminal vesiculoscopy. The diagnosis could be confirmed immediately once the aplastic upper urinary tract, which is connected with the agenetic seminal vesicle, and the ureteral stone are found endoscopically.

Surgical management should be suggested once the diagnosis is established. Ureteroscopic lithotripsy can be done during ureteroscopy. However, the placement of a double-J stent was not necessary for this present case because of the wide opening of the left ureteral orifice. Besides, the double-J stent was not needed for the non-functional upper urinary tract, since it is used for urine drainage [8]. On account of the

Lower aplastic ureteral calculi and seminal vesicular calculi

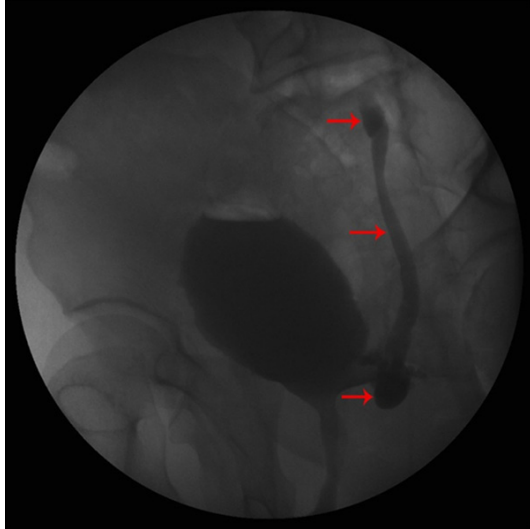


**Figure 2.** Computed tomography of the urinary tract (A-C). (A) The arrow demonstrated the absence of the left kidney in its normal site. (B) The arrow showed the lower ureteral stone resembling the seminal vesicular calculi. (C) The arrow revealed the junction between the left seminal vesicle and the bladder.



## Lower aplastic ureteral calculi and seminal vesicular calculi

**Figure 3.** Endoscopic images (A-D). (A) The wide opening of the aplastic left ureteral orifice and the lower ureteral calculi in cystoscopy. (B) The aplastic left renal pelvis in ureteroscopy. (C) The opening of the left seminal vesicle to the lower ureter in ureteroscopy. (D) The aplastic left seminal vesicle with stone fragments in ureteroscopy.



**Figure 4.** Cystourethrography. Cystourethrography showed severe vesicoureteral reflux on the left. The arrows indicated the aplastic upper urinary tract and the agenetic seminal vesicle.

fact that the agenetic kidney and seminal vesicle are usually non-functional and may present as a threat to the patient's health, radical surgery is also optional.

In conclusion, the lower ureteral calculi in AUISVO is rare and can be easily misdiagnosed. The aplastic ureteral calculi should be considered for the patients with CSFK appearing to have seminal vesicular calculi, ureteroscopy and seminal vesiculoscopy must be performed to confirm the diagnosis.

### Acknowledgements

This study was supported by the Science and Technology program of Hunan Scientific Committee (Grant No. 2013WK3014).

### Disclosure of conflict of interest

None.

**Address correspondence to:** Leye He, Department of Urology, The Third Xiangya Hospital of Central South University, 138# Rd, Tongzipo, Changsha 410013, Hunan, P. R. China. E-mail: leyehe@csu.edu.cn

### References

- [1] Doroshov LW and Abeshouse BS. Congenital unilateral solitary kidney: report of 37 cases and a review of the literature. *Urol Surv* 1961; 11: 219-229.
- [2] Hiraoka M, Tsukahara H, Ohshima Y, Kasuga K, Ishihara Y and Mayumi M. Renal aplasia is the predominant cause of congenital solitary kidneys. *Kidney Int* 2002; 61: 1840-1844.
- [3] Akl K. The anomalies associated with congenital solitary functioning kidney in children. *Saudi J Kidney Dis Transpl* 2011; 22: 67-71.
- [4] Ohgaki K, Horiuchi K, Oka F, Sato M and Nishimura T. A case of seminal vesicle cyst associated with ipsilateral renal agenesis diagnosed during an investigation of perineal pain. *J Nippon Med Sch* 2008; 75: 122-126.
- [5] Ghonge NP, Aggarwal B and Sahu AK. Zinner syndrome: A unique triad of mesonephric duct abnormalities as an unusual cause of urinary symptoms in late adolescence. *Indian J Urol* 2010; 26: 444-447.
- [6] Kuo J, Foster C and Shelton DK. Zinner's Syndrome. *World J Nucl Med* 2011; 10: 20-22.
- [7] Wang F, Wu HF and Yang J. The ejaculatory duct ectopically invading the bladder with multiple congenital malformations of the homolateral urogenital system: a report of a rare case and an embryological review. *Asian J Androl* 2009; 11: 379-384.
- [8] Clavica F, Zhao X, ElMahdy M, Drake MJ, Zhang X and Carugo D. Investigating the flow dynamics in the obstructed and stented ureter by means of a biomimetic artificial model. *PLoS One* 2014; 9: e87433.