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Acute pyelonephritis revealing an intraprostatic obstructive megaureter in an adult: A rare finding

Rani Kassir^{a,*}, Marie Ngamba^b, Jean-Luc Michel^a, Mohamad Zalzal^c, Frédérique Sauvat^a, Benoit Renger^b^a Department of Pediatric Surgery, CHU Félix Guyon, Allée des Topazes, 97400, Saint Denis, La Réunion, France^b Department of Urology, CHU Saint Pierre, Avenue du Président Mitterrand, 97448, Saint Pierre, La Réunion, France^c Department of Public Health, Boston University, 715 Albany St, Boston, MA 02118, United States

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ABSTRACT

INTRODUCTION: Duplicated renal collecting system is one of the most common congenital upper urinary tract abnormalities. Duplex system with ectopic obstructive megaureter in the prostatic urethra is rare and exceptionally revealed in adulthood.

PRESENTATION OF CASE: We present a rare case of a 72-year-old man without any previous history of urinary symptoms, admitted through the emergency department for altered general condition associated with fever for several days. Investigations have identified left complete duplex system and intraprostatic obstructive megaureter manifesting as acute pyelonephritis. The evolution of acute pyelonephritis was favorable under urine drainage by percutaneous nephrostomy tube and antibiotherapy.

Given the multiple comorbidities of the patient, radical surgical treatment by left upper pole nephrectomy was ruled out and we opted for an iterative change of percutaneous nephrostomy tube.

DISCUSSION: We briefly review the pathophysiology, diagnosis and therapeutic aspects.

CONCLUSION: Early diagnosis and treatment of complicated duplex system is important. Urologists should keep this anomaly in mind.

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1. Introduction

Duplicated renal collecting system is one of the most common congenital upper urinary tract abnormalities [1]. Estimated prevalence ranges between 0.3–6% in the general population [2,3]. Although considered an anatomical variant, duplex collecting system may be complicated by vesicoureteral reflux, ureterocele, or ectopic ureter [4]. Recent progress in the fetal medical imaging makes its discovery in adulthood increasingly rare.

Here, we report a case of duplicated renal collecting system with ectopic obstructive megaureter in the prostatic urethra discovered late to adulthood.

The work has been reported in line with the SCARE: Agha RA, Fowler AJ, Saetta A, Barai I, Rajmohan S, Orgill DP, for the SCARE Group. The SCARE Statement: Consensus-based surgical case report guidelines. International Journal of Surgery 2016 [10].

2. Presentation of case

A 72-year-old Caucasian male patient admitted through the emergency department for altered general condition associated with a fever for several days. Past medical history includes: hypertension, two cerebrovascular accidents with persistent deficits and chronic alcohol consumption. The patient has no previous history of urinary tract infection or urinary incontinence. Previous renal function (creatinine and creatinine clearance) was normal. Further questioning of family members showed that the patient did not complain of hesitancy in urine flow, interrupted flow, or difficulty to start urinating which was affirmed by the patient once he was stabilized and able to provide reliable medical history.

Clinical examination at the time of admission revealed altered mental status (Glasgow Coma Scale at 9), altered hemodynamic conditions (blood pressure at 70/40 mmHg with a heart rate of 120 beats per minute), fever at 38.5 °C, signs of peripheral hypoperfusion (cold and mottled ends) and diffuse abdominal pain in addition to post-CVA deficits.

Laboratory work-up was significant for a marked leukocytosis (White Blood Cells (B)=24,700 cells/mm³ – Polymorphonuclear leukocytes (PMN)=21,300 cells/mm³), acute kidney injury (creatinine = 288 μmol/L – creatinine clearance = 20 ml/min/1.73 m²)

* Corresponding author.

E-mail addresses: Ranikassir@hotmail.com (R. Kassir), marie.ngamba@chu-reunion.fr (M. Ngamba), Jean-luc.michel@chu-reunion.fr (J.-L. Michel), miz02@mail.aub.edu (M. Zalzal), frederique.sauvat@chu-reunion.fr (F. Sauvat), benoit.renger@chu-reunion.fr (B. Renger).

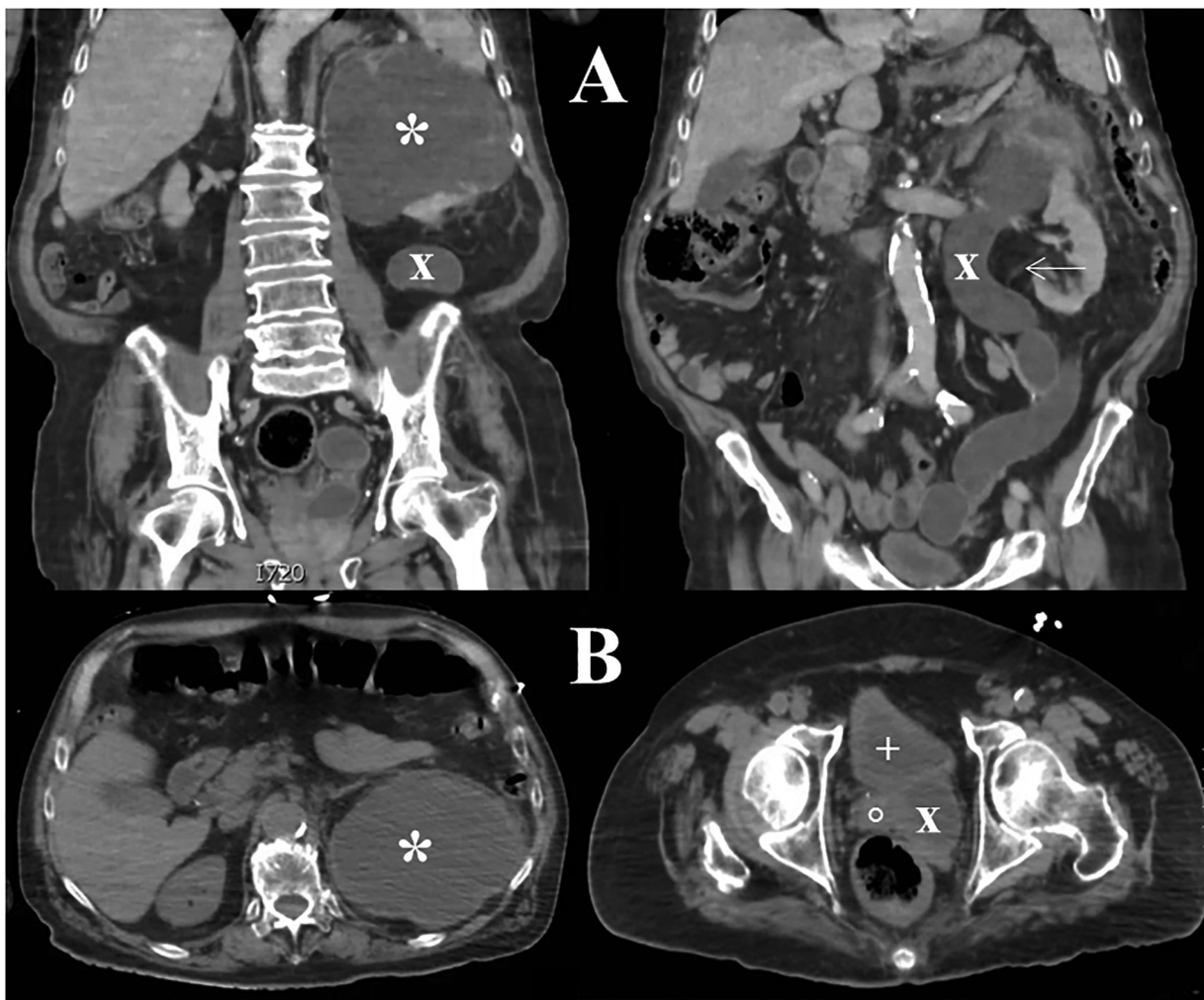


Fig. 1. CT Abdomen and Pelvis without Contrast. (A): Coronal view. (B): Axial view.
 * : Hydronephrosis of the upper pole (140 mm).
 x : Upper pole ureter massively dilated (30 mm).
 → : Lower pole ureter thin.
 O : Prostate.
 +: Bladder.

and major biological inflammatory syndrome (C-Reactive Protein = 140 mg/L). Urine analysis was positive and urine culture was positive for *Escherichia coli*.

First, Patient's blood pressure was stabilized and adequate pain control was achieved. Then patient underwent Computed Tomography (CT) Abdomen and Pelvis without Contrast (Fig. 1). This CT showed left complete duplicated collecting system with ectopic obstructive upper pole ureter in the prostatic urethra. This was responsible for a significant left uretero-hydronephrosis complicated with acute pyelonephritis with severe sepsis. The transverse diameter of the ectopic ureter was 3 cm. Upper pole of left kidney was atrophic. The right kidney was normal.

Since the patient was on anti-platelet therapy, we initially considered an endoscopic drainage of urine faced with the impossibility of percutaneous drainage by nephrostomy. During cystoscopy under general anesthesia, ureteral meatus of the Lower pole was found at the level of the vesical trigone, retrograde ureteropyelography showed no dilatation. Ureteral meatus of the Upper pole was found over the prostatic utricle. 1.2 L of purulent urine was drained,

but we could only set up that an endovascular probe 5F × 100 cm in the Upper pole considering the multiple siphons. This treatment was not optimal as purulent urine persisted despite the intervention.

After 5 days of discontinuation anti-platelet therapy, we performed a percutaneous drainage of the Upper pole by setting up a nephrostomy tube 8F × 35 cm.

The evolution of severe sepsis was favorable under drainage and third generation cephalosporin antibiotherapy adapted to antibiogram.

Given the multiple comorbidities of the patient, radical surgical treatment by left upper pole nephrectomy was ruled out and we opted for an iterative change of percutaneous nephrostomy tube. This practice reduces the risk of bacterial colonization and emergence of resistant bacteria. Patient was closely followed up by surgical team and ID and frequently cultured to adjust the antibiotic therapy accordingly.

After several hospitalizations for recurrence of acute left pyelonephritis, patient died of septic shock 9 months later.

3. Discussion

Duplex collecting system affects more women than men. It is six times more common unilaterally than bilaterally and often on the right side [3].

Anatomically, there are two types of double system: complete and incomplete. In complete ureteral duplication, the two poles will independently give rise to two ureters extending into 2 ureteral meatus. In the partial ureteral duplication (bifid ureter), the 2 ureters will merge before joining to form a single ureter.

Embryologically, complete ureteral duplication is due to the presence of more than one ureteric bud that develops and migrate to the metanephrogenic blastema. While the partial ureteral duplication is formed when the ureteric bud splits prematurely before entering the metanephrogenic blastema [5,6].

Robert Meyer and Carl Weigert (Weigert Meyer Rule) are the first physicians to identify, during cystoscopy in patients with complete duplex system that ureteral meatus of the upper pole usually fits in the lower and medial part of the bladder whereas ureteral meatus of the lower pole usually fits into the trigone of the bladder. This is explained by the fact that during development, Ureteric bud of the upper pole rotates and migrates more caudally than the ureteric bud of the lower pole. As a result, upper pole ureter has a more caudal meatus than lower pole ureter [5,6].

This anatomical arrangement is not always asymptomatic. Lower pole ureter has a short submucosal course and therefore a risk of vesicoureteral reflux (VUR). Upper pole ureter can be complicated by a ureterocele or an ectopic insertion, which is the case in this patient. In males, upper pole ureter may enter the prostatic urethra, the seminal vesicles, the ejaculatory ducts, the vas deferens, the epididymis and the rectum. On the other hand, in females, the upper pole may enter the vagina, the bladder neck, the uterus and the cervix. Ectopic insertion may be obstructive, resulting in dilation of the ureter and kidney.

This anomaly can be asymptomatic. However, it can manifest as recurrent urinary tract infection or urinary incontinence. In our patient, the ectopic ureteral meatus abutted above the prostatic utricle explaining the absence of urinary incontinence.

Furthermore, the patient living in Reunion Island and reported to consume curcumin which has been implicated in “improving the symptoms of chronic urinary tract infections, protect renal tubular function, and also decline inflammatory responses by influencing the expressions of TLR2 mRNA and TLR4 mRNA so as to exert its curative effect on chronic urinary tract infections” [7]

We found no explanation for the asymptomatic nature preceding the late clinical manifestation of this case as the patient has no history of renal stones, BPH or recurrent UTIs.

In case of complicated duplex collecting (as in our patient), the surgical treatment may include upper pole nephrectomy or total nephrectomy. For pediatric patients, nephron-saving surgery is recommended [8].

The death of our patient, certainly fragile, could have been prevented by earlier discovery of this left uretero-hydronephrosis with surgical treatment.

This case is of particular interest due to the presence of three urinary anomalies. Duplicated renal collecting system with two ureteral orifices, one of which was both ectopic and obstructive in the prostatic urethra, which is a rare finding. In addition, the late discovery at the age of 72 of a Duplicated renal collecting system with a major uretero-hydronephrosis passed undetected is exceptional.

4. Conclusion

Early diagnosis and treatment of complicated duplex system is important. Surgery when feasible should be offered to prevent future sequel and complications.

Urologists should be fully aware of this abnormality and its therapeutic management. However, routine Ultrasonography for asymptomatic patients is not recommended due to the rare nature of this abnormality. Clinicians should keep a high suspicion for anatomical defects in elderly patients as the imaging techniques that would have detected such an abnormality wasn't available at birth for this select patient population.

The only similar case found in the literature [9] describes a complete duplex system with an ectopic obstructive megareter in the prostatic urethra, incidentally discovered in a 67-year-old asymptomatic man. The approach was conservative.

Conflict of interest

None.

Funding

None.

Ethical approval

The study is exempt from ethnical approval in our institution.

Consent

Informed consent was obtained from his family (patient was dead when the article was written).

Authors contribution

Rani Kassir: Conception and design of the study. Data collection. Data interpretation. Writing the paper.

Marie Ngamba: Operated and managed the patient.

Jean-Luc Michel: Conception and design of the study.

Mohamad Zalzali : Data interpretation.

Frédérique Sauvat: Data collection.

Benoit Renger: Conception and design of the study.

Registration of research studies

The study is exempt from registration.

Guarantor

Rani Kassir.

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