



## A Child with Right Complete Ureteral Duplication Revealed by Sepsis in Northern Benin: A Case Report

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### Abstract

Upper urinary tract abnormalities are relatively common and may be diagnosed before or at birth. Some cases will be seen during complications that most often are obstructive. We herein report one case of complete right ureter duplication revealed by sepsis. The case involved one little girl aged 3 years, referred from a peripheral health center for prolonged fever. Physical examination found out a right flank mass connecting with the lumbar spine, renal ballotement, and pain due to a blow to the right flank. Further explorations helped establish the diagnosis of complete duplication of the right ureter with the destruction of the upper renal pelvis. Little girl benefitted from a dual antibiotic therapy combined with partial nephrectomy of the right kidney upper pole. Infectious are serious complications in upper urinary tract obstructions resulting in kidney destruction; therefore, early diagnosis is required.

### Keywords

Ureteral Duplication; Sepsis; Nephrectomy; Child

### Introduction

Ureteral duplication is one of the most common defects of a child's urinary tract [1]. It is reflected by the existence of two pelves drained by two ureters at the level of one or of both kidneys. Its clinical expression is variable. More often asymptomatic it can be discovered incidentally during a medical examination performed for other diseases. Sometimes, it may be revealed during serious complications, such as repeated urinary tract infections and even septicemia with the destruction of the renal parenchyma. We herein report the case of complete ureteral duplication revealed by severe

sepsis in a 3-year little girl in the pediatric unit of Borgou/Alibori Regional teaching Hospital in Northern Benin.

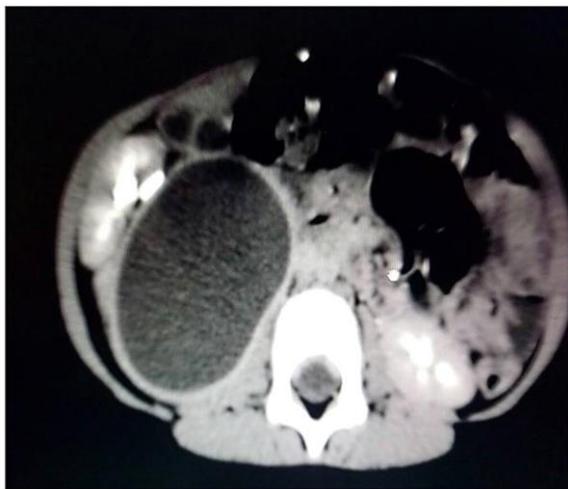
### Observation

The subject was a 3-year little girl, with no particular medical history, referred from a peripheral health center for prolonged fever. That fever which oscillated between 39 and 40°C has been progressing for two weeks, associated with food vomiting, hypogastric pain and release of dark urines. The physical examination had identified an altered general state, a temperature of 38°5 c, a heart rate (HR)

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estimated at 180 beats per minute (bpm), a respiratory rate of 50 counts per min, a blood pressure of 100/60mmhg, cold hands, an extended time of recoloring; and a weight of 17Kg. Abdominal palpation made it possible to find out a smooth, renitent and painful right flank mass in contact with the lumbar spine. Genital organs were normal. The urine test strip had revealed the presence of white blood cells and nitrites.

An abdominal ultrasound had shown a fluid mass with heterogeneous content pushing the right kidney downwards. The contralateral kidney was normal. Uropelvic computed tomography had highlighted a heterogeneous fluid mass located in the medial cranial part of the right kidney with spur sign. The right ureter was visible in the back of the mass (**Fig-1**). The cyto-bacteriological examination of urine



**Fig-1: The right hydronephrosis by pelvic Tomography scanner**

with culture and antibiogram had highlighted leukocyturia of 12000/ml, bacteriuria estimated at  $10^6$ /ml with isolation and identification of *Klebsiella Oxytoca* which was sensitive, among others, to gentamycin. Complete blood count had revealed hyperleukocytosis at 23G/L with the predominance of polymorphonuclear leukocytes (75%). C-reactive protein was positive at 48mg/L. The blood concentration of creatinine was normal at 8mg/L. As regards therapy, the little girl received a vascular filling with a salted serum of 9/1000 concentration. This was followed by antibiotic therapy consisting of ceftriaxone with a dosage of 100mg/kg /j during 10

days combined with gentamycin for 5 days. Partial nephrectomy of the upper pole had been performed a second time. In the preoperative phase, two collecting systems had been identified on the right side: ureter of the upper renal pelvis was dilated with 750cc of dark urine and parenchyma was completely wiped out; the parenchyma and ureter of the lower renal pelvis were normal (**Fig-2**). Postoperative side-effects have been simple. The cytobacteriological examination of urine cultures was normal after treatment. The little girl after doing well has been seen regularly.



**Fig-2: The complete ureteral duplication in the preoperative phase**

## Discussion

Ureteral duplication is a common malformation of the urinary tract. One child out of 125 is carrying this anomaly. Female subjects are the most affected [2]. The right and left kidneys are equally affected; which may be bilateral in 20 to 40% [1].

Anatomically, two variants are described: partial duplication or ureteral bifidity, and complete duplication or ureteral duplicity. In the partial form, the two ureters originate from the kidney and join together at a variable level before liaising with the bladder. In the complete form, both ureters are independent throughout their route till ureteropelvic junction [1]. There are uncommon forms: inverted duplication [2,3]. Sometimes, they may be associated with other malformations: vesicoureteric reflux,

ureterocele, megaloureter and ectopic anastomosis [4,5]. In our case, it was right ureter duplication characterized by an ectopic anastomosis of the ureter of the upper renal pelvis with the bladder.

Ultrasound contributes significantly to the antenatal diagnosis of urogenital malformations; however, it remains very moderately specific as regards ureteral duplication. For instance, hydronephrosis is the joint ultrasound expression [5], only postnatal radiological monitoring helps determine with accuracy the etiology of that dilatation. In the postnatal period, clinical expression depends on the expressive renal pelvis. Indeed, upper renal pelvis is often associated with ectopic ureter anastomosis, which is a source of urine loss or obstruction to urine flow, most often asymptomatic. In contrast, the lower renal pelvis is a fertile ground for vesicoureteral reflux. [1,2,4].

Urinary infection is the main circumstance of malformation diagnosis [4]. In our female patient, it manifested itself by pyelonephritis complicated by a septic shock that may have left her dead. In the little girl, ureteral ectopy may occur as persistent urinary incontinence despite the frequency of normal mictions. It is difficult, for parents, to notice incontinence before the child's age of cleanliness and hygiene, which may explain the delay in diagnosis [2] as was the case of our patient. Ureteral duplication is confirmed by the identification of two collecting systems at the level of a single kidney. The most effective examinations in this detection are intravenous urogram (IVU) or intravenous pyelogram (IVP), computed tomography (CT) of the kidneys and magnetic resonance imaging (MRI) [5-7]. In the case of our patient, the computed tomography (CT) of the kidneys performed did not contribute very significantly. For instance, ureteral dilatation was so significant on the upper renal pelvis that it was considered as a renal cyst.

Treatment consisted of two components. Medical management of pyelonephritis was ensured through a dual antibiotic therapy with satisfactory clinical progression. Surgical care consists in performing nephrectomy of the kidney's upper pole. This

therapeutic option was chosen because it was described that the kidney area drained by an ectopic ureter is often non-functional and with dysplasia [8]. It is a semi-conservative treatment of the kidney. Resources are available to assess the functionality of the upper renal pelvis [9,10].

Although partial nephrectomy for the upper urinary tract was performed, the risk for vesicoureteric reflux was not excluded on the main ureter. Therefore, patient regular follow-up is required for early detection and management of that anomaly. Ultrasound predictive criteria were developed for the diagnosis of vesicoureteric reflux.

### Conclusion

As a malformation, ureteral duplication is common among children. It consists of two anatomic forms: ureteral duplication and ureteral bifidity. In the context of ureteral duplication, signs are noisy when other malformations are associated with it, especially vesicoureteric reflux and ectopic anastomosis cases. Urinary infection is the main way of the revelation of that malformation. Therefore, early diagnosis is urgently necessary.

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### Declaration of Interest

The authors declare that there is no conflict of interest.

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