Boy with renal failure after renal transplant

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A 16 years old boy with chronic renal failure, chronic dialysis, Alport syndrome, severe renal osteodystrophy, and severe arterial hypertension was admitted in the Clinical Institute of Urology and Kidney Transplant. After the renal transplant a transvesical ureteral stent has been placed for 14 days. Four hours after the catheter was removed diuresis stopped and surgical reintervention was needed to correct a ureteral fistula. Intravenous antibiotic therapy and fluids were administered and the immunosuppressant medication was continued (Ciclosporine, CellCept, Cortisone) in order to prevent transplant rejection. The patient was discharged 28 days after the transplantation with normal renal function. After 3 weeks of favorable outcome the patient was admitted in the Pediatric Clinic presenting acute painless macroscopic hematuria, decrease of diuresis, shivers, and fever (39°C). Laboratory studies revealed high creatinine levels (6 mg/dl) and metabolic acidosis. Urine culture was also performed. The B-dimensional kidney ultrasonography is illustrated in figure 1. Doppler ultrasound detected a permeable vascular anastomosis and renal graft hypovascularization. The outcome was unfavorable with worsening of the renal function and development of sepsis. Therefore explant surgery was necessary. The resected graft is presented in figure 2.

Questions:
1. Describe the ultrasonographic renal abnormalities detected.
2. Establish the diagnosis in this case.
3. Make a list of the possible differential diagnoses for this case.

Fig 1. Ultrasonographic aspect of kidneys.

Fig 2. Macroscopic aspect of the resected graft.
1. What is the reno-urinary anomaly in this case?

The reno-urinary anomaly in this newborn girl is represented by a complete collecting system duplication associated with ureterocele.

2. Describe this type of reno-urinary anomaly and mention other ultrasonographic abnormality in this newborn.

In complete collecting system duplication the upper pole has an ectopic ureter (Weigert-Meyer law) with a distal end projected into the urinary bladder in an ectopic intra or extravesical position. The upper moiety, with the ectopic extravesical ureter, usually is hypoplastic and collecting system is dilated; in girls is manifested by incontinence. The intravesical ectopic ureter has a medial and caudal implantation compared to a normal position of an ureterovesical junction [1,2].

An ectopic ureter can extend into the urinary bladder, condition defined as ureterocele. If the ureterocel extends to the bladder neck or passes through the urethra, it is called ectopic ureterocele. Prolaps of the ureterocele can determine a bladder outlet obstruction. Usually, the presence of the ureterocele induces an important dilatation of the upper collecting system. The upper moiety parenchyma is reduced. The lower collecting system pathology is represented by vesicouretral reflux or pelviureteral junction obstruction.

If ureteral duplication doesn’t associate with other anomalies, ultrasound exam detects only a larger than normal kidney with a parenchyma “fold” located inside of the renal pelvis, without collecting system dilatations [1,3].

If the urinary content is hypoechoic or with floated echogenic spots inside, the suspicion for the presence of urinary tract infection is high.

In Figure 1a, the longitudinal scan of the kidney revealed an important dilatation of the upper part of the collecting system with an hypoechoic content and a reduced parenchyma thickness at this level; there is also a mild dilatation of the lower pelvis. Longitudinal view of the urinary bladder (Figure 1b) showed a large “cystic” mass in the urinary bladder (the ureterocele), with a hypoechoic aspect of the content. The urinary bladder presents many echogenic spots inside. The aspect is suggestive for urinary tract infection (this is the other ultrasonographic abnormality detected by ultrasound in this presented case). Urine culture revealed an infection with Klebsiella. Figure 2 presents the aspect after antibioterapy (urine culture was sterile). There are the same structural changes, respectively important upper collecting system dilatation, very thin upper pole parenchyma and large ureterocele. The urinary system content is transonic after treatment.

3. Specify a complication which represents an emergency in this situation.

An emergency situation in this case could be represented by the acute urinary retention. An ectopic ureterocele can pass through the urethra and urine acute retention is due by the urethral obstruction. Bladder outlet obstruction is the most frequent cause of urethral obstructions in girls. In this situation, the treatment aims to decrease pressure in the ureterocele by ureterocele puncture, an endoscopic treatment using cystoscopy [3,4]. In the presented case the outcome was favorable, without urinary retention or recurrent urinary tract infections.

References

**Erratum**


The authors have been made aware of the error that appeared in the paper on page 275: the images of figures 2 and 3 were inverted. The caption of figure 2 should be paired with the image of figure 3 and vice-versa.

**Erratum**


The authors have been made aware of the error that appeared in the order of their surname and last name at the first two authors. The correct order is: Rosaria Renna, Daniele Coraci.