

What to do with living donor graft lithiasis?

Predisposing conditions / multifactorial aetiology:

- Hereditary tubular resorption disorders (cystine).
- Dietary: purine intake (☹ uric acid stones).
- Drugs: steroids or antacids, Vit C, sulfonamides, triamterene, indinavir,...
- Immobility and obesity.
- Hyperoxaluria < ileal hyperabsorption (jejunoileal bypass, pancreatitis, enteritis, M. Crohn), hyperoxalose and pyridoxine deficiency.
- Preexisting stones.
- Anatomic abnormalities:
 - Ureteral obstruction. UPJ stenosis.
 - Sponge kidneys.
 - Vesicoureteral reflux.
- Recurrent UTI. Urea splitting organisms increases the urinary pH.
- Metabolic abnormalities:
 - Hypercalcemia < hyperparathyroidism, metastasis, M. Paget, sarcoidosis, renal tubular and chronic acidosis...
 - Crystalluria. Uricosuria and gout (☹ uric acid stones).
 - Hypocitraturia & hypophosphataemia.
 - Hypovolaemia / dehydration.
- Foreign bodies: ureteral stents. Nephrostomy tubes and nonresorbable suture material.

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INTRODUCTION: Urolithiasis in donor graft kidneys is a very rare condition and is seen in 0,4% of the living donor kidneys. The appropriate pretransplant management is not yet defined. A literature review shows only 14 cases of living donor gifted allograft lithiasis. Based on this experience we treated a donor kidney after laparoscopic donor nephrectomy and before the transplantation with an ex-vivo ureterorenoscopy.

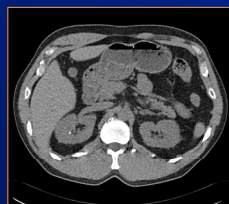
PATIENTS AND METHODS: A 49 year old male presented as a donor. In the preoperative medical history one risk factor for calculus formation was found: obesity with a BMI of 31.1. An abdominal CT was routinely made and showed 2 asymptomatic calculi in the right kidney: one upper pole calculus of 5 mm and another of 6 mm in the lower pole. The metabolic screening showed an increased calcium and urate urinary excretion. We performed a laparoscopic living donor nephrectomy of the right kidney to preserve the donor's best kidney, because it is recommended to preserve the best kidney in the donor in case of abnormalities. During the Bench procedure an ex vivo ureterorenoscopy was performed with a 5 French semi-rigid scope. The access to the renal collecting system was easy and both stones were visualized.

RESULTS: The extraction of 2 stones was successfully and the procedure lasted only 5 minutes. An ex-vivo ureterorenoscopy offers an excellent visibility and the mobility of the ureter ex vivo simplifies this minimal invasive procedure. There were no complications pre- and post-operatively.

CONCLUSION: Preoperative imaging to visualize the vascular anatomy of the donor kidney on computer tomography is also useful in diagnosing urolithiasis. Ex vivo stone extraction during the Bench procedure for kidney transplantation is a successful method to treat urolithiasis in living donor kidney. It can prevent postoperative acute renal failure due to obstructive lithiasis, often presenting without specific symptoms. It is important to inform the recipient that she should be aware of the possibility of recurrence of lithiasis. These patients should be followed with yearly imaging.

Atypical clinical presentation of stone disease

- Acute or chronic rejection or acute renal failure in a renal transplant recipient.
- Hydronephrosis-associated renal deterioration < obstructive uropathy.
- Febrile urinary tract infection.
- Unexplained fever.
- Macroscopic hematuria.
- Ureteral stricture.
- Asymptomatic stone discovery by abdominal US in 0,37 – 0,64%.
- Typical renal colic does not occur in NTx recipients because the ureter has been denervated.



Publication	Nr of patients	Cadaveric donor kidney	Living donor kidney	Location	Nr of stones	Treatment
Lerut <i>et al</i> , 1979	1	1		-	-	-
Donnelly <i>et al</i> , 1984	1	1		-	-	-
Van Gansbeke <i>et al</i> , 1985	2	2		1 Renal 1 Ureteral	2	-
Bhadoria <i>et al</i> , 1995	2		2	-	-	2 x ESWL post-Tx
Lu <i>et al</i> , 2002	3	3		1 UPJ stone of 2,5 mm 1 lower caliceal stone of 9 mm 1 obstructing ureteral stone	3	3 x Anterograde PNL post-Tx
Capocasale <i>et al</i> , 2002	4	3	1	4 Caliceal 3-4 mm 1 Ureteral 15 mm	5	Spontaneous passage Ureterotomy
Gomez <i>et al</i> , 2003	1	1		-	-	ESWL post-Tx
Qazi <i>et al</i> , 2003	2	2		1 Proximal ureter 5 mm ... acute postop. Tx failure 1 ureter... acute postop. Tx failure	2	URS + Basket Spontaneous passage
Rashid <i>et al</i> , 2004	10		10	Renal pelvis	9	ExURS during Bench
Knipscheer <i>et al</i> , 2004	1		1	2 Caliceal 4-5 mm	2	ExURS during Bench
TOTAL	27	13	14			