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Minimally invasive treatment of bilateral ureteropelvic obstruction with massive calculi

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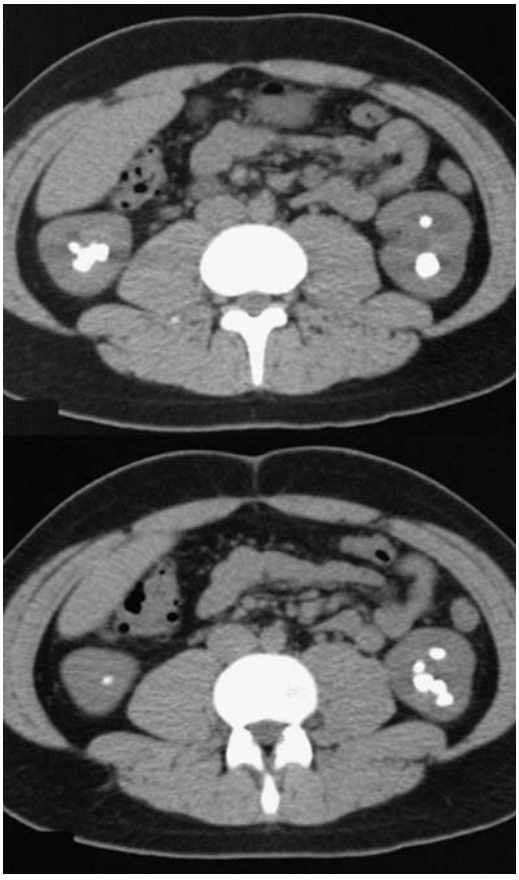

Figure 1 | Two-dimensional CT scan. There are several large non-obstructing calculi within the calyces of both kidneys**.**

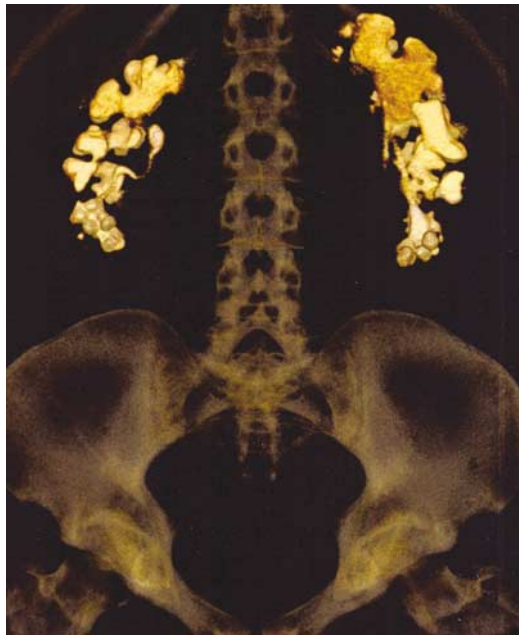

Figure 2 | Three-dimensional CT urogram. Three-dimensional reconstructed images demonstrate moderate bilateral hydroureteronephrosis to the level of the UPJ**.** Contrast within the dilated calyces obscures the lower pole calculi bilaterally.

An asymptomatic 17-year-old boy was referred for evaluation of microscopic hematuria detected on routine urinalysis. The patient denied any medical problems. He had not been on any medications and had no family history of kidney disease. The physical exam was unremarkable. The blood urea nitrogen was 13 mg dl^{-1} (4.64 mmol l^{-1}) and Cr was 1.0 mg dl^{-1} (88.4 μmol l^{-1}); serum electrolytes were normal, urinalysis showed 2+ protein and 3+ blood with >30 red blood cells per high power field and multiple calcium oxalate crystals on microscopic examination. The computed tomography (CT) scan (Figure 1) revealed massive bilateral nephrolithiasis. Moderate bilateral hydronephrosis to the level of ureteropelvic junction (UPJ) was seen on the three-dimensional CT urogram (Figure 2). The CT scan did not demonstrate any evidence of crossing vessels. Ureteroscopy confirmed bilateral UPJ obstructions with approximately 10 large stones in each kidney. Successful bilateral percutaneous nephrolithotomy with flexible endoscopy and endopyelotomy was performed (Figure 3). The retrieved stones were composed of calcium oxalate monohydrate and dihydrate (1:1).

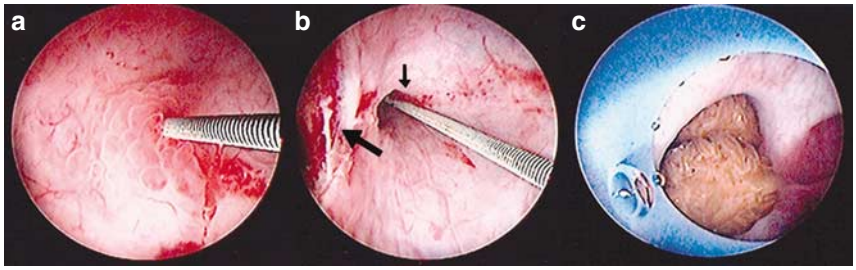

Figure 3 | Endoscopic images. (**a**) UPJ before incision—note constriction around guidewire, (**b**) distal aspect of incision (large arrow) and patent proximal ureter (small arrow) following endopyelotomy; (**c**) calculi collected in calyx, adjacent to a renal papilla.

Congenital obstruction of the UPJ is the most common cause of hydronephrosis in children. The etiology of UPJ obstruction may include intrinsic stenoses, valves, ureter insertion anomalies, peripelvic fibrosis, or crossing vessels. Both, sporadic and familial forms exist and bilateral obstruction occurs in 20% of the cases. Urinary stasis is generally assumed to play a major role in the pathogenesis of nephrolithiasis associated with UPJ obstruction.