

# Stone management in children

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Children constitute only a small number of the total patients with urolithiasis. Nevertheless, pediatric stone disease is an important health care problem because of its high recurrence rate. In recent years, the incidence of pediatric stone disease has increased several-fold, mostly owing to hypercalciuria and hypocitraturia. Chang Kit and colleagues<sup>1</sup> article highlights the pattern of nephrolithiasis in developed countries and depicts the major differences in presentation, predisposing factors and treatment options in children presenting with urinary stones.

Children can present with a wide range of symptoms varying from flank pain and hematuria to nonspecific symptoms such as irritability and nausea. Ultrasonography and plain radiography play a role in diagnosis and follow-up. As shown by Chang Kit and colleagues, the most common diagnostic radiological methods used were abdominal ultrasonography (74%) and (or) abdominal plain film radiography (56%). Approaching pediatric urolithiasis requires a thorough metabolic and environmental evaluation of all patients on an individual basis, and as shown by Chang Kit and coworkers, 41% (28/69) had a metabolic abnormality. In addition, since there is a high recurrence rate, metabolic evaluation of every child with a urinary stone should be undertaken, medical treatment should be given when indicated and children should be followed closely to avoid stone recurrence.

The medical treatment is based on the chemical composition of the stone and the biochemical abnormalities causing its formation; hence, chemical analysis of the stone, urine and blood is of paramount importance and should be done when the first stone is detected. The nonpharmacological means to address stone disease include high fluid intake and, frequently, modification of nutritional habits. Urine volume increases in parallel with body mass index, and medical therapeutic agents that increase urine citrate levels should be encouraged. Limiting salt in the diet and drinking plenty of water are the best ways to prevent the most common types of kidney stones or to slow their growth, but the ease in applying these dietary guidelines in children is not known. Furthermore, obstructive pathologies such as ureteropelvic junction obstruction have to be corrected concomitantly when present, and apparent metabolic abnormalities should also be treated adequately. The goal of medical treatment is not only to decrease recurrence but also to decrease the expansion of existing stones.

It is thought that children have elastic ureters, allowing them to pass stones easily. In Chang Kit and colleagues' study, 47% of patients spontaneously passed their stones even when they were as big as 11 mm. Nevertheless, more than one-half of the patients needed surgical intervention. With recent advances in technology, stone management has changed from an open surgical approach to less-invasive approaches such as extracorporeal shock wave lithotripsy and endoscopic techniques. In children, clearance of stones after extracorporeal shock wave lithotripsy especially in the presence of metabolic abnormality is necessary because residual fragments are clinically significant in children and increase the chance of adverse clinical outcomes.<sup>2</sup> Thus these patients, particularly

those with identifiable predisposing disorders, require close follow-up.

Traditionally, upper urinary tract calculi that are too large to treat with extracorporeal shock wave lithotripsy are most commonly cleared with percutaneous endoscopic techniques. Recently, improved ureteroscopic access to stones throughout the pediatric urinary tract and stone-free rates that are comparable to the adult population have led to the adoption of ureteroscopy as first-line therapy in children at our institution.<sup>3</sup> In a select group of patients who are poor candidates for percutaneous nephrostolithotomy, retrograde endoscopic lithotripsy is becoming an attractive option. Thus with miniaturization and advances in technology, large and complex upper urinary tract calculi can be addressed safely and efficiently with retrograde endoscopic techniques. For instance, ureteroscopy achieves reasonable results with minimal complications in pediatric patients with renal pelvic calculi. On the other hand, polar stones require multiple sessions for complete clearance, and staghorn calculi may not be amenable to ureteroscopy. In their article, Chang Kit and colleagues do not report the number of procedures performed that lead to full success for each surgical approach, nor do they report the complications that occurred when they approached the patients surgically.

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