

MEditorial April 2013

SOME THOUGHTS ABOUT KIDNEY STONES

Symptomatic kidney stones (urolithiasis) affect perhaps 1 out of 10 people during their lifetime. Once someone has declared him/herself to be a stone former, the recurrence rate is close to 50% within 5 years. Also, not to be discussed in detail in this MEditorial, it is not all that clear that preventative strategies (diet, medications, etc.), beyond increased fluid intake and voluminous urine output, reduce stone formation or symptomatic episodes. This may relate to the concept that stone formation is complex and involves genetics and what I like to call the “black box” of metabolism, i.e., the entire biochemistry of our bodily functions. In some cases, circulatory problems inside the kidney may be predisposed to stones. Stones can cause severe symptoms; but since they are episodic (most prone patient will have a few in their lifetime), individuals with urolithiasis often do not “comply” with the doctor’s recommendations about lifestyle changes, diet, hydration, and prophylactic medications. The evidence that infrequent stone formers benefit from extensive evaluation for the cause of their stones and subsequent preventative strategies is not as strong as you would think.

I assess a lot of patients with asymptomatic stones, often in the kidneys. Recently I saw a man whose serial CT’s done over a 2 year time period show a greater than 1 cm. ureteral (thin tube between kidney and bladder) stone with hydronephrosis (backup of urine into kidney which affects kidney’s filtration of the blood). That man, despite lack of symptoms, was shown by a nuclear renal function study to already have lost some of the function of that sided kidney—so we are planning to eradicate the stone soon with shockwave lithotripsy, ureteroscopy, or both. In my practice, I tend to have a high threshold for treating asymptomatic stones located in the kidney. Since the minority of stones in the “collecting system” of the kidney causes any blockage to urinary flow, measurable hindrance to kidney function, or

infection, they tend not to be associated with pain. Most kidney stones grow slowly, over months if not years. On non-contrast CT, the best radiologic study to assess all urinary stones, one can often see multiple small stones in a patient who is in the process of passing a stone. Fewer than 4 mm. (1/6 of an inch) stones are difficult to eradicate by the three main minimally invasive treatments including extracorporeal shockwave lithotripsy, ureteropyeloscopy, and percutaneous nephrostolithotomy. Large asymptomatic intrarenal stones should be treated, especially if they take on a “staghorn” appearance, since these can cause chronic health problems including serious kidney infections and shrinkage of the kidney. Some studies suggest that, for example, hard-to-treat asymptomatic mid-sized (i.e., around 8-10 mm.) stones in the lower pole of the kidney should be treated, since at least a third of these will cause problems within 5 years of being discovered. This has not been my experience; and those problems cited include such things as pain and transient bleeding that often resolve on their own. Also, stones in the “basement” of the kidney are harder to eradicate than stones in the main “living room” or those “upstairs”. With the great diagnostic and therapeutic tools we urologists possess to treat symptomatic stones, it is certainly questionable as to whether “stones minding their own business” need to be aggressively pursued. One could paraphrase Isaac Newton’s third law of motion, to the tune that for every stone intervention, there is going to be an equal [and opposite] reaction. There is a potential side effect profile associated with stone treatments—including failure to achieve the objective-- that retrospectively, may make the patient suffer more than if he/she had simply been reassured.

Pain (“ureteral colic”) from stones is related to obstruction and less commonly, infection. Pain tends to wax and wane. The very 1st episode of colic, until the stone is gone, besides catching the patient off-guard, is often the worst. If the stone is causing blockage within the kidney or more likely within the confined space of the ureter, pain may continue until the stone

passes or is treated by the urologist. Although some attribute pain to the stone progressing toward the bladder, it is probably not the stone moving, in itself, but the spasm and obstruction created in the “new” resting place, that triggers pain. Respites from pain are likely due to relaxation of the spasm of the “smooth” muscle encircling the ureter. Giving tamsulosin (Flomax) or similar alpha-blockers may relax this smooth muscle, help alleviate pain, and enhance the stone expulsion rate.

ER doctors often call me about stones. There is a misperception that stones causing hydronephrosis (fluid back-up into a kidney) as noted on CT and ultrasound, are dangerous and require acute hospitalization--if not immediate treatment. This is not so. Symptomatic ureteral stones have at least an 85% chance of being associated with hydronephrosis—it’s almost a guarantee that someone in the ER with severe ureteral colic will have this radiographic finding. At the same time, over 80% of these patients will spontaneously pass their stone--and the odds are significantly increased with the routine use of the drugs tamsulosin and its relatives.

Factors warranting intervention include fevers associated with an obstructing stone, stone size, duration of disability, and intractable symptoms such as pain and nausea--often associated with loss of work. Fevers may indicate accumulation of pus in the blocked kidney, requiring urgent drainage with a tube placed into the kidney (more essential than the immediate treatment of the stone). Stones larger than 6 mm. (1/4 inch) have a significantly lower spontaneous passage rate than those 4 mm or smaller. stones. There are exceptions--and we do see greater than 1-cm. stones pass without too much fanfare. Stones that are impacted in the ureter for a time period of greater than 6 weeks are not likely to pass, even if symptoms are on the wane. I recently had two highly symptomatic individuals with tiny 2-3 mm. stones stuck for 4-6 weeks in the lower ureter. Both were removed by me ureteroscopically. One had a jagged stone, which

was “biting” into the lining of his ureter and causing significant ureteral wall swelling (which gave this miniscule stone the “power” of a much larger stone). The other man had what turned out to be child-sized ureteral orifices (“golf hole-like” openings of ureter into bladder), which disabled him from passing his stone.

To speak somewhat in generalities, ureteroscopy is a great treatment for all ureteral stones and some kidney stones. Used with a Holmium laser, the stone-free rate is 90-95% after one treatment, although some patients will need pre-stenting (with a so-called “JJ” stent) and a minority will need a similar stent, for a while, postoperatively. Shockwave lithotripsy has about a 10% lower stone-free rate but is noninvasive and usually does not require a stent. If a ureteral stone is in the lower ureter or requires more immediate “definitive” treatment due to the degree of symptoms, I am more likely to suggest ureteroscopy as a 1st line therapy. Using percutaneous nephrostolithotomy (by “drilling” a less than 1 inch hole under anesthesia through the back skin and muscles into the kidney and thus taking a shorter/direct path to the stone) is appropriate for large kidney stones and sometimes for lower pole stones not treatable with the other modalities; or a situation whereby multiple stones in different parts of the same kidney require eradication under the same setting.

Analogous to the lack of symptoms not equating to stone passage in the case of an untreated episode of colic, remember that the lack of symptoms after a stone treatment is not tantamount to being stone-free. Clinical and radiographic follow-up are needed to detect the as high as 4-5% of treated patients who may have silent hydronephrosis, either from retained stone fragments (seen more after shockwave lithotripsy) or scar narrowing (stricture) of the ureter, especially after a difficult ureteroscopy.

I never like to see any of my patients suffer; stone disease is certainly a memorable event for the patient. Nonetheless, in many cases, a

conservative approach of close observation; symptomatic control of pain and nausea; medical expulsive therapy (“MET”) with tamsulosin; and follow-up with ultrasound and plain x-ray and @ times, a repeat low radiation protocol non-contrast CT, is quite reasonable--with the consent of the patient--to avoid unnecessary interventions/costs and the small but omnipresent potential for temporary or more permanent urological complications.

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