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"Stones and Moans"

Kidney stones (calculi) are a common urologic problem, and have a folklore of their own in terms of victims telling horror stories of great suffering, e.g., "worse than giving birth". In a future article, I will address some the theories as to why humans get kidney stones. By the way, years ago, I had a veterinarian as a patient, who, as a gift for my care, brought in a bottle ("trophy") of urinary stones he had removed from several "domesticated" mammals under his care.

Stones can be found anywhere in the urinary tract. Stones that form in the bladder do so for reasons less related to diet and metabolism/genetics, and are usually attributed to poor urinary turnover from the bladder either due to poor bladder muscular function and or chronic obstruction (e.g., from a large prostate). Once kidney stones form, they may or may not make themselves apparent. Often there is no pain, since there is a reasonable amount of space within the kidney--and most renal stones cannot block the calyces, or chambers, inside. It is felt blockage and not "scraping" causes pain, since internal hollow viscera (body tubes such as ureters and intestines) send pain signals to the brain mainly when they are distended, like the inflation of a balloon. Microscopic blood in the urine may be a tip-off to an otherwise asymptomatic kidney stone.

People may pass stones without knowing it or have a brief twinge of pain, not paying much attention to the underlying cause. Smaller stones, 4 mm. and under, are more likely to be associated with this. In fact, we do not understand exactly what triggers a stone to go from the kidney towards the bladder via the ureter (tube that joins the two). We see many individuals who have stable or slowly increasing size/number of calculi without ever having a severe attack of pain (ureteral colic).

Larger stones do tend to get caught, usually at the UPJ (ureteropelvic junction, 1st part of ureter) or the pelvic inlet (where the ureter enters the pelvis from its location in the back of the abdominal cavity) or the UVJ (ureterovesicle junction, lowermost part of ureter at its entrance into bladder).

Pain, nausea, vomiting, blood in the urine and lower urinary tract symptoms (frequency, urgency, “false warnings” to urinate, and burning often at the end of the stream), are common with a stone. An actual fever is less so, and raises the spectrum of pus starting to build up in the kidney. This situation may warrant more urgent intervention.

Many patients with an acute stone episode end up in the ER since they are often moaning and writhing in pain. It has become far more common for patients to have their diagnosis made, pain controlled and discharged home to pass the stone on their own or see a urologist as an outpatient to possibly intervene. Often the 1st colic attack from a given stone is the worst--although certain patients will have a hard time and may end up visiting the ER several times. Hospitalization is usually not required. The fact that an x-rays (e.g., a non-contrast CT of the abdomen and pelvis, the most useful one for stones) shows an obstructed kidney is not, per se, a reason for being placed into the hospital or immediately having intervention.

The size of a ureteral stone and the duration/severity of symptoms are the primary determining factors as to whether something will need to be done. Those calculi over 6 mm. can be pesky and resistant to passage.

The drug tamsulosin (Flomax), (used for prostate enlargement and voiding dysfunctions), has been demonstrated to help relax the ureter and thus facilitate passage especially of <6 mm. stones. Although Flomax can cause dizziness and needs to be used carefully especially in the elderly and those with certain cardiovascular conditions, it should, I believe, be tried as part of the initial strategy in most “ureteral colic” patients. Adequate pain control, sometimes with non-narcotic drugs such as ketrolac (Toradol), is important as well as is, in selected cases, medicine to alleviate nausea. Antibiotics are seldom needed for a stone attack . Their use really should be restricted. A urine culture (for bacteria) should be sent before antibiotics are taken--even if for a good clinical reason.

Patients passing a stone should strain ALL their urine with a stone strainer or coffee filter to see if something can be recovered since (1) this is as good a proof as any that the episode is over and may avoid

unnecessary follow-up x-rays , and (2) sending the stone for analysis is important in predicting future stones and advising patients as to risk factors and possible prevention. Many stones cause off-and-on symptoms-- thus absence of symptoms, even for days and weeks, is not tantamount to the stone having passed.

If a stone is causing severe symptoms, treatments can be broken down into palliative versus therapeutic. Palliation means a procedure to temporarily relieve the obstruction until the stone passes or is treated. This type of intervention can be very helpful for a patient with a stone and fever; or to get an individual back toward normalcy while awaiting a more detailed/involved surgery. Two common relatively simple procedure are (1) “JJ” stent, placed by the urologist--totally stenting or splinting the ureter (entirely inside)--via a cystoscope under anesthesia; and (2) PCN (or percutaneous nephrostomy) tube with possible “antegrade JJ” stent placed by a radiologist under anesthesia or at least under sedation via a tube inserted through the back into the inside of the kidney. A PCN tube is partially external. These types of tubes usually are removed within a matter of weeks.

Therapies for stones seldom involve dissolution (“melting” stone with medicines) since most stones contain calcium and these do not dissolve well. Uric acid stones, a distinct minority of kidney stones, can be dissolve with medicines that alkalinize the urine--but the process is slow, more so for large stones; this strategy would not, in itself, be practical for a highly symptomatic calculus.

Shockwave lithotripsy (ESWL), invented in the early 1980’s, is an incredible technology applicable to stones anywhere in the urinary tract but often used more for calculi within the kidney or upper two thirds of the ureter. Overall success rate in 80-90% and it can be performed more than once to a stone. It is the least invasive modality--but usually still done under general anesthesia . Endoscopic procedures, including ureteroscopic stone removal (often accompanied by holmium laser fragmentation of especially larger stones--or percutaneous stone removal (via a tract placed by a radiologist into the kidney through the back) are excellent minimally invasive procedures used to treat stones felt more suitable by the urologist for these than for ESWL. For example, a stone stuck in the lower ureter or even higher up may lend itself to an easy

ureteroscopic (narrow rigid or flexible telescope passed up ureter through urethra/bladder) stone extraction. A large renal “staghorn”-shaped stone, which can fill a good percentage of the “inner tube” of the kidney, may be best treated first with percutaneous debulking--as opposed to ESWL. Open surgery for kidney and ureteral stones, as well as “newer” procedures to approach the ureter through its outside (via the abdominal cavity) using laparoscopes or robotically-controlled laparoscopic instruments, is usually not needed.

When I was in college, one of the “gut” or easy courses, oft’ felt designed to get athletes through to graduation, was nicknamed “Rocks for Jocks”. This basic geology course (I did not take it!) reminds us that the human body can be studied and “mined” for its richness in geology. Urinary stones are a prominent and sometimes quite painful reminder of this.

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