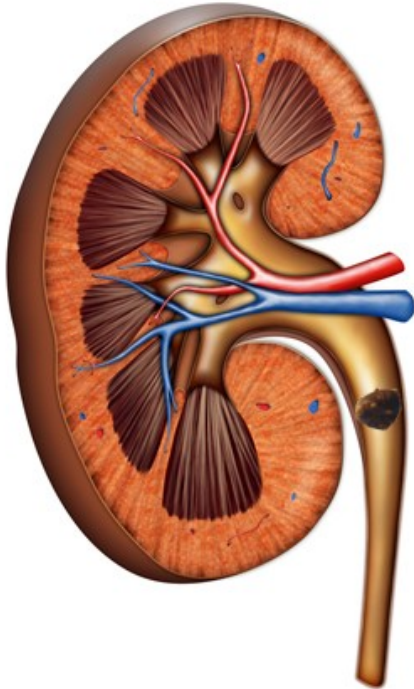


Nephrolithiasis is characterized by the formation of stones in the urinary tract. Calcium oxalate is the principal component of most stones. Thus, causes of hypercalcemia such as hyperparathyroidism, sarcoidosis, and cancer should be considered when evaluating patients presenting with kidney stones. Chronic bacterial infections due to ammonia-producing organisms can result in stones composed of magnesium ammonium phosphate. Increased uric acid (most commonly due to gout) can result in renal stones composed of uric acid. Renal tubular acidosis can result in stones formed from calcium phosphate and cystinuria can result in cystine stones.



Stones found in the renal pelvis do not typically cause pain unless they are associated with urinary obstruction or infection. As the stones pass down the ureter, however, they can produce severe flank pain that radiates to the groin, that accompanied by nausea and vomiting, closely resembles an acute abdomen. Hematuria is usually present. If the stone causes obstruction of urine flow, symptoms of renal failure may be present.

Patients with renal stones require a fluid intake high enough to maintain a urinary output of 2-3 liters per day. Most stones pass through the kidney tract without any intervention, however, when they cannot pass spontaneously, ureteroscopy may be performed to remove the stone. Extracorporeal shock wave lithotripsy may also be employed to break up stones into smaller pieces so that they can pass spontaneously. The most recalcitrant stones may require a percutaneous nephrolithotomy.

*Stoelting RK, Dierdorf SF. Anesthesia & Co-Existing Diseases. 5th ed. New York, NY: Churchill-Livingston; 2008: 343.*