Obstructive Uropathy in Pregnancy

A 23-year-old G1P0 woman, at 26+0 weeks’ gestational age, was admitted with abdominal and lower back pain with suspected nephrolithiasis. The patient subsequently became febrile, tachycardic and had a rise in serum creatinine. A contrast-enhanced CT of the abdomen and pelvis was performed showing a 0.5-cm calculus within the proximal left ureter (white arrow, A) with mild hydronephrosis and delayed persistent excretion of contrast that was administered for a chest CT the preceding day (red arrow, B C). The left renal parenchyma was heterogeneously enhancing (black arrow, C), suggestive of postobstructive edema vs pyelonephritis. The patient’s hospital course was complicated by pyelonephritis and septicemia, for which she underwent placement of a left double-J stent and subsequent lithotripsy.

The incidence of urolithiasis in pregnancy is approximately 1:2000; however, it is the most frequent cause of nonobstetric abdominal pain. Anatomic and physiologic contributing factors lead to urolithiasis during pregnancy, such as ureteral compression by the gravid uterus and smooth muscle relaxation secondary to high progesterone levels. These factors lead to gestational hydronephrosis, causing urinary stasis and promoting calculus formation.

Ureteral obstruction is a complication that can further lead to acute kidney injury, pyelonephritis, urosepsis and premature labor, conditions that are life-threatening to the mother and fetus. Imaging is a key component in achieving a prompt and accurate diagnosis. An ultrasound of the kidneys and bladder is the first-line study in evaluation of nephrolithiasis in pregnancy, posing no risk to the fetus. It, however, has both low sensitivity and specificity in the pregnant patient. The second-line imaging study is a CT of the abdomen and pelvis without contrast. Although there is exposure of the fetus to radiation, CT is the most sensitive and specific exam with an almost 100% renal calculus detection rate, and should be performed if diagnosis cannot be made with ultrasound, or if the patient clinically deteriorates. There is increasing clinical interest in using MR over CT for evaluation of ureteral obstruction as it avoids radiation, but interpretation may be challenging as the stones, particularly if small and nonobstructing, may be difficult to visualize due to low signal intensity on most pulse sequences.

Initial management of urolithiasis in pregnancy is conservative, with use of analgesics and hydration to promote spontaneous passage of the calculus. This approach can only be utilized in uncomplicated cases. If the patient has signs of infection or fails conservative management, temporizing intervention is indicated, with placement of a ureteral stent or percutaneous nephrostomy. Definitive treatment with lithotripsy is preferably performed postpartum, but in cases that require definitive treatment during pregnancy, ureteroscopic lithotripsy is recommended.

REFERENCES