

Ultrasonography

Ultrasonography is the procedure of choice for patients who should avoid radiation, including pregnant women and possibly women of child bearing age. It is very sensitive for the diagnosis of urinary tract obstruction and can detect radiolucent stones missed on KUB; however, it may miss small stones and ureteral stones. Ureteral stones can often be detected by transvaginal ultrasonography. This topic, including alternatives if ultrasound studies are negative but clinical suspicion remains high, is discussed in detail elsewhere.

The use of imaging modalities in combination frequently improves overall accuracy. In one study, for example, the combination of ultrasonography and abdominal radiography provided somewhat comparable results to that observed with non-contrast helical CT alone. Whether this combination is an alternative to CT when access to CT is limited requires further evaluation.

Recommendations — The diagnosis of nephrolithiasis is suspected in all patients with the acute onset of atraumatic flank pain, particularly if without abdominal tenderness and with hematuria. The superior sensitivity and specificity of non-contrast helical CT compared with KUB, IVP, and ultrasound suggest that it is now the initial diagnostic study of choice in most cases. One report found that, compared with IVP, helical CT was faster (26 versus 69 minutes) and only slightly more expensive (\$600 versus \$400). These parameters are likely to vary depending upon the institution, but the accuracy and speed of diagnosis of helical CT appear to outweigh its cost.

Standard CT cuts are generally 8 mm, but 3 to 5 mm cuts are optimal for the detection of stones. The specificity of helical CT is nearly 100 percent; thus, a positive study confirms the diagnosis of nephrolithiasis and patients should be treated appropriately. A negative study should prompt consideration of a different diagnosis. An IVP or ultrasonography are alternatives if helical CT is not available.

Individual patient factors may influence the work-up in some instances [51]:

- Ultrasound is the initial diagnostic test in pregnant women or in patients in whom cholecystitis or a gynecologic process is a prominent consideration.
- Abdominal plain film is a reasonable initial test in patients who have a history of radiopaque calculi and acute flank pain that is similar to that in previous episodes. However, a helical CT scan may be necessary if the abdominal plain film is negative, since the latter test may miss stones in the ureter.

Further evaluation consists of determining the predisposing factors to stone formation with blood tests and urine collections. This is an essential part of the evaluation since therapy to prevent recurrent stone formation is determined by the biochemical abnormalities that are present.

See also BestBET “**KUB sensitivity at detecting urinary calculi**”