



REMARKS

1 General

- 1.1 Renal calculi tend to be recurrent, and flank pain is a non-specific symptom that may be associated with other entities; therefore, evaluation with imaging is recommended at the initial presentation.

2 Plain radiograph

- 2.1 Kidney, ureter and bladder radiograph (KUB) may be sufficient to diagnose ureterolithiasis in patients with known stone disease and previous KUBs. The sensitivity of the KUB for ureterolithiasis in other patients is poor.
- 2.2 While the KUB may be a valuable part of the intravenous urogram (IVU) or US evaluation of flank pain, it has a very limited role when used alone, and it should not be used to triage which patients should receive non-contrast computed tomography (NCCT).

3 IVU

- 3.1 The IVU is the previous standard study for ureterolithiasis and is still the best investigation if NCCT is not available. It provides information regarding site and degree of obstruction, size of stone, and effect of obstruction on renal excretion.

4 US

- 4.1 US is particularly useful in patient with high risk of contrast media reaction or pregnancy.
- 4.2 The size of stones cannot be measured accurately and ureteric stones may not be shown on US.
- 4.3 When US is combined with KUB, it can increase the capability to detect small stones and more accurately measure stone size.

5 CT

- 5.1 NCCT as the initial study in evaluating flank pain, numerous investigations have confirmed it to be the study with the highest sensitivity (95%-96%) and specificity (98%) for ureterolithiasis. Stone size can be measured accurately in cross-section, aiding in predicting outcome. Stone location, accurately depicted by NCCT, has also been associated with spontaneous stone passage rates, with the more proximal stones having a higher need for intervention.
- 5.2 NCCT is also reliable for diagnosing flank pain due to causes other than ureterolithiasis such as appendicitis and diverticulitis.
- 5.3 When CT is available, it is the best first study in the non-pregnant adult presenting with flank pain likely to be due to stone disease, and it has been shown to be more cost-effective than IVU.

REFERENCES

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3. Mermuys K, De Geeter F, Bacher K, Van De Moortele K, Coenegrachts K, Steyaert L, et al. Digital tomosynthesis in the detection of urolithiasis: Diagnostic performance and dosimetry compared with digital radiography with MDCT as the reference standard. *AJR Am J Roentgenol.* 2010; 195: 161-167.