

FIVE THINGS TO KNOW ABOUT ...

Imaging in urolithiasis

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Non-contrast-enhanced computed tomography is the “gold standard” for the evaluation of renal colic

Computed tomography (CT) can be performed rapidly and can detect radiolucent stones, except for drug-induced stones. It is preferred over intravenous pyelography or urography because it is more sensitive and does not require the use of intravenous contrast medium. Stone size and burden, and the degree of urinary obstruction can be directly measured. Up to 90% of stones less than 5 mm in diameter, particularly if located in the distal ureter, will pass spontaneously.¹ Stones greater than 5 mm usually require urologic intervention. The density of stones can also be determined using Hounsfield units (HU); stones with a density greater than 1000 HU respond less well to lithotripsy.¹

Ultrasonography is the initial investigation of choice in pregnant women and in children

The sensitivity of ultrasonography depends on the size and location of the stone and the body habitus or presence of overlying bowel gas.³ Adequate hydration aids in the detection of the calculus. When ultrasonography yields inconclusive results, limited sequence intravenous urography or low-dose non-contrast-enhanced CT can be considered for pregnant patients; exposures required to image the enlarged maternal abdomen with conventional radiography can increase the radiation dose level to that of CT.^{4,5} In children, plain radiography is the second choice to ultrasonography, followed by low-dose non-contrast-enhanced CT⁵ (see Appendix 1, at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.101638/-/DC1).

Radiographic follow-up is helpful for specific groups of patients

Because complications of urolithiasis include infection and obstruction that may lead to septicemia or irreversible parenchymal damage, radiographic follow-up is useful in patients with multiple episodes of symptomatic stone disease, those who elect conservative management and those who have undergone a urologic intervention.^{1,3} A patient who is passing a stone spontaneously should be followed up every one or two weeks for three to four weeks to follow progression and monitor for obstruction.¹ If there is a known radiopaque stone, plain radiography can be performed two to four weeks after any surgical intervention to ensure no clinically significant fragments remain.³

Plain radiography can be useful in investigating renal colic in patients with a history of radiopaque stones

Plain radiography of the kidneys, ureters and bladder is a reasonable initial investigation in patients with a history of radiopaque stones who present with renal colic. The mean size of the stone detected with plain radiography is 4.2 mm; the mean size missed is 3.1 mm.² For the 10% of patients with known radiolucent calculi, CT or ultrasonography are better diagnostic alternatives.³

Radiographic screening can monitor stone burden

Annual plain radiography is useful in patients who have asymptomatic, radiopaque stones and those who form recurrent stones to ensure stone burden is not increasing.³

References

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