

What is the best test to diagnose urinary tract stones?

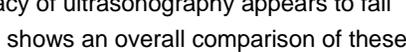
Erik J. Lindbloom, MD, MSPH

University of Missouri–Columbia

■ EVIDENCE-BASED ANSWER

Over the past 3 years, helical (or spiral) computerized tomography (CT) has proved the best method of testing for urinary tract stones. All reviewed studies published since mid-1998 found helical CT scan to be the safest and most accurate test. (Grade of recommendation: A, based on independent blind comparison of an appropriate spectrum of patients.)

■ EVIDENCE SUMMARY

Several studies demonstrating the accuracy of helical CT have been published recently.¹⁻³ The most convincing are 2 prospective studies done in emergency departments in Belgium and Australia.^{1,2} Both compared helical CT with intravenous pyelography (IVP) and used the gold standard of recovery and direct visualization of a stone. The Australian study enrolled 40 consecutive patients; the Belgian study enrolled 53 of 70 consecutive patients. In these 2 studies, helical CT correctly identified every instance of urinary tract stones. In contrast, IVP failed to detect stones in a third of the patients with stones, and 44% of the negative readings were false-negatives. Both tests did well in reporting negative results for those patients without stones (specificity = 97% for both tests). In terms of likelihood ratios, helical CT and IVP had positive likelihood ratios of 29 and 19, respectively, and negative likelihood ratios of 0 and 0.36 (a lower negative likelihood ratio is better). In other words, helical CT appears to be far superior to IVP in ruling out the presence of urinary tract stones. As an additional comparison, another study found that urine dipstick testing for hematuria yielded positive likelihood ratios of 1.25 and a negative likelihood ratio of 0.55.⁴ The accuracy of ultrasonography appears to fall somewhere in between hematuria testing and IVP.⁵ The  shows an overall comparison of these diagnostic tests.

In addition to its better accuracy, several studies discuss the better safety profile and decreased diagnostic time of helical CT than IVP.⁶⁻⁸ The risk of contrast reaction during IVP is between 5% and 10%, with a mortality of approximately 1 in 40,000. Helical CT (when evaluating for stones) does not use contrast, although the radiation exposure is approximately twice that of IVP.⁶ The costs of helical CT and IVP are comparable, and helical CT becomes more cost effective when the shorter time to discharge with a definitive diagnosis is considered.^{7,8} Several authors also cite instances when helical CT uncovered a nonurinary cause for patients' symptoms that IVP would have missed.^{8,9}

Access to helical CT is improving throughout the United States, and individual radiologists can become quickly skilled at helical CT interpretation.¹⁰ Physicians should confirm that their local radiologists are comfortable with helical CT readings before incorporating this into their diagnostic routines.

■ RECOMMENDATIONS FROM OTHERS

Several urology and radiology departments have published reviews lately supporting the use of helical CT over other diagnostic testing for urinary tract stones.^{9,11} No official recommendations from professional organizations were found.

CLINICAL COMMENTARY

Sang-Ick Chang, MD

University of California, San Francisco

From a practical point of view, spiral CT has been a far superior modality for diagnosis of urinary tract stones. It is much faster, avoids contrast, renal function is not an issue, and previous bowel preparation is not needed. Given the relatively poor performance of the IVP compared with spiral CT, there is no situation I can think of where IVP would be preferred over the spiral CT. The only caveat is that spiral CT is not practical in all practice settings. Still, the 56% negative predictive value for IVP is much lower than we commonly assume and renders the IVP useful mostly for information it can tell us about the size and location of any stone it finds and relatively useless for ruling out stones.

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