

STONE DISEASE

Plain radiography still is required in the planning of treatment for urolithiasis

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Introduction: Nonenhanced computed tomography (NCT) is recognised as the most sensitive tool in diagnosis of renal tract calculi. However, its role as the sole imaging investigation, for decisions regarding management is less clear.

Objective: To determine the proportion of new stone patient referrals in which management is altered by interpretation of a plain abdominal kidneys, ureters and bladder (KUB) radiograph in addition to NCT.

Methods: One hundred consecutive new referrals to a national lithotripsy centre were considered prospectively for treatment of renal tract calculi.

Results: A significant change in management was undertaken in 17 patients on the basis of KUB findings. Eleven patients had radio-lucent ureteric stones, for which Extracorporeal Shockwave Lithotripsy (ESWL) was consequently not possible and who required endoscopic management. There were six inaccuracies in measurement of size or positioning on NCT. In a further 43 patients it was not possible to confirm management until the KUB was reviewed, although in these cases ESWL or expectant management was still pursued. Thus additional imaging with a KUB was required in order to confirm optimum management in 60 patients.

Conclusion: Additional plain radiography confers a significant advantage in the planning of treatment for urolithiasis once the diagnosis has been established by NCT because of information it provides regarding radiopacity as well as stone size and visibility. This information cannot be delivered by NCT alone. We therefore recommend that KUB imaging is performed on all new stone patients referred for treatment.

Editorial Comment

The study population is a select group - patients referred to a well-established national lithotripsy service in Scotland under well-established protocol and guidelines. The study may therefore underestimate the value of KUB - it is feasible that other patients evaluated at the point of entry (local urologist) may have undergone KUB imaging and a decision was made not to proceed with referral for SWL. In addition, the authors do not report the time interval between CT scan imaging at the local urologist office and subsequent KUB imaging at the tertiary referral center. It is possible that the impact reported for KUB was reflective of movement of the stone over time rather than added clarity from additional imaging.

The authors did not evaluate the utility of Hounsfield units to predict the radiolucent characteristic of the stone - it is possible that could negate the need for plain radiography. The authors did not have a PACS system that allowed them to directly measure stone size on the CT scan, nor did they have access to the full CT scan images - rather they relied on "select hard copies". One would anticipate that the predictive value of CT scan imaging would increase were all the images available for review.

The authors note that renal pelvic and lower pole anatomy is helpful to predict shockwave success, however they do not report how this was interpreted on plain radiography. Coronal reconstructions of the NCCT may have provided useful information in this regard. The authors do not report the number of observers who measured the stones on radiographic imaging, nor do they comment on the inter-observer reliability of such measurements on CT and KUB.

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A comparison of the physical properties of four new generation flexible ureteroscopes: (de)flexion, flow properties, torsion stiffness, and optical characteristics

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Background and Purpose: Several kinds of flexible ureteroscopes are in use for the removal of kidney stones. This study evaluated and compared the characteristics of four new-generation flexible ureteroscopes.

Materials and Methods: The flexible ureteroscopes studied were: the ACMI Dur-8 Elite, the Storz Flex-X2 the Olympus XURF-P5, and the Wolf 7325.076. Measured properties included (de)flexion, instrument insertion, flow properties, torsion stiffness, and optical characteristics. Active tip deflection and irrigation flow rates with and without various endoscopic tools were assessed.

Results: All ureteroscopes score better on (de)flexion with an empty working channel, compared with a channel when tools are inserted (differences minimum 0.3 degrees--maximum 80.6 degrees). The Olympus XURF-P5 is the only ureteroscope with passive (de)flexion capability, whereas the ACMI DUR-8 Elite is the only ureteroscope that has a secondary active (de)flexion capability. The Storz Flex-X2 and the Wolf 7325.076 ureteroscopes show nearly identical best deflection capabilities with and without tools inserted in the working channel. The longest (Olympus XURF-P5, 70 cm) and shortest (ACMI DUR-8 Elite, 64 cm) ureteroscopes have, respectively, the lowest and highest flow rates. Best optical quality is offered by the Olympus XURF-P5 and Wolf 7325.076 ureteroscopes, which have low optical distortion (-9.7; -7.7%), high resolving power (17.95; 16.00 line pairs per millimeter), and a large field of view (62.9; 63.2 degrees). The Storz Flex-X2 and Wolf 7325.076 ureteroscopes have lowest torsion stiffness.

Conclusions: The ex vivo evaluation of the deflection capabilities, passage of instruments, flow properties, torsion stiffness, and optical characteristics yielded quantitative measures of the in vivo performance capabilities of four new-generation flexible ureteroscopes. New ureteroscopes should be subjected to this or similar evaluation and comparison. Only in this way can the urologist make an informed and objective decision regarding appropriate instrument choice.

Editorial Comment

In general, this is an elaborate and well-conducted study that offers helpful information in selecting the best flexible ureteroscope for clinical use. However, the study is significantly limited by the lack of statistical analysis. The authors do not report the visual acuity of the 4 observers who subjectively scored the "resolving power" of the ureteroscopes. Though the radius of curvature was qualitatively reported, no quantitative analysis was presented.

The limiting factor in endoscopy is the quality of image. Image is everything! One can conclude based on this study that the Wolf flexible ureteroscope is optimal - low optical distortion, high resolving power and large field of view, with superior illumination compared to the Olympus scope. One limitation of this study is that only one scope was tested from each manufacturer - variance may exist between multiple scopes of the same make and model.

Often image quality deteriorates quickly in the face of bleeding or stone fragmentation - it would be useful to evaluate the ureteroscopes under these conditions.

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