Larger proximal ureteral stones with severe pain, rather than computed tomography-defined ureteral obstruction, are associated with urological intervention

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Cite as: *Can Urol Assoc J* 2017;11(3-4):93. http://dx.doi.org/10.5489/cuaj.4511

See related article on page 88.

As evidence-based urologists, we are always looking for objective parameters to help us decide whether to perform interventions for patients presenting with urolithiasis. According to the latest Canadian Urological Association guidelines for management of ureteral stones, patients presenting with ureteral stones <5 mm could be managed conservatively, provided that they don't have infectious symptoms, intolerable pain, or a threat to renal function.[1] When urological intervention is contemplated, the decision-making process takes into account patient-related factors (intolerable pain, infectious complications, impending renal failure, coagulopathies and renal anomalies including solitary kidney); and stone-related factors (stone size, location, density, and skin-to-stone distance). However, signs of ureteral obstruction on computed tomography (CT) are not part of the guidelines.

In their study, Massaro et al performed a retrospective review of 195 patients presenting with ureteral stones at a tertiary Canadian centre between 2011 and 2013.[2] Forty-two percent of the patients presenting with ureteral stones underwent urological intervention, including cystoscopy with retrograde pyelography, placement of ureteric stent, shockwave lithotripsy, and/or ureteroscopic laser lithotripsy. A radiologist and a urologist independently reviewed all CT scans for predefined criteria of ureteral obstruction (no obstruction, partial, or complete obstruction) based on degree of hydronephrosis, hydroureter, nephromegaly, and perinephric stranding. In addition, the authors examined other potential predictors for intervention, including patient demographics, stone size and location, amount of analgesics used, signs and symptoms of infection, serum creatinine, cumulative intravenous fluid administered, and the prescription of medical expulsive therapy.

Not surprisingly, the authors found that stone size and location, in addition to cumulative opioid dose, were independent predictors for urological intervention. In fact, every mm increase in stone size increased the likelihood of intervention 2.2 times (odds ratio [OR] 2.17; 95% confidence interval [CI] 1.67–2.85). The OR exceeded unity for stones larger than 4.5 mm, indicating higher likelihood of urologial intervention for stones larger than 4.5 mm. Similarly, proximal stones were 4.7 times more likely to require intervention than distal stones (OR 0.21; 95% CI 0.09–0.49). Finally, every 10 mg increase in morphine administered was associated with a 30% increase in the odds of intervention (OR 1.30; 95% CI 1.07–1.58). However, degree of obstruction was not an independent predictor of intervention for ureteral stones (OR 1.757; 95% CI 0.899–3.436). Finally, none of the variables predicted 30-day return to the emergency department (ED). This could be explained by the very low number of returns to the ED in both groups.

Despite its retrospective nature, this study confirms previous studies that ureteral stone size (>4.5 mm), proximal location, and intractable pain requiring higher doses of opioids are associated with urological intervention. Furthermore, the degree of ureteral obstruction on CT scans did not predict intervention. While CT scan findings of hydronephrosis, hydroureter, nephromegaly, and perinephric stranding are helpful in diagnosing ureteral stones, they are not helpful in guiding the decision-making process for intervention.

Competing interests: The author reports no competing personal or financial interests.

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