# *Renal Colic:*

## *Current Role for Medical Expulsive Therapy*

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Urolithiasis is a common disease whose prevalence and the burden it places on public health expenditure is increasing. Consequently, greater emphasis is being placed on cost-effective diagnostic and treatment strategies, as well as, secondary prevention to decrease stone recurrence. The objective of this review is to discuss these and other current trends in the evaluation and non-surgical management of patients with renal colic.

### *Diagnostic Evaluation*

Renal colic typically presents as pain that begins in the flank and radiates to the lower abdomen and groin. Nausea and vomiting are common, while fever signals infection proximal to an obstructing stone. Mild leukocytosis, microscopic hematuria and pyuria are often present.

Since its introduction in 1995, unenhanced CT kidney, ureter and bladder (CT KUB) has replaced IV urography (IVU) as the imaging study of choice for confirming the diagnosis of renal colic. CT KUB is more sensitive than IVU and avoids the use of IV contrast. However, with increasing use of CT has come increasing concern about radiation exposure. Up to 50% of first time stone formers will develop another stone within five years and many will therefore receive multiple CT scans. Because of this, lower dose CT techniques with comparable accuracy to traditional CT are being implemented. Ultrasound is also being widely adopted as an initial screening study. Besides being widely available, inexpensive and non-invasive, it has an overall sensitivity that is comparable to CT, although it may miss small middle and lower ureteral stones. The value of plain radiography should also not be overlooked, as an opacification in the kidney or ureter confirms the diagnosis and often precludes the need for more costly imaging studies.

### Meet Brian

Brian is a 42-year-old overweight male who presents with a 12-hour history of right lower quadrant pain. He is afebrile and his abdomen soft. His white blood cell count is 12,800/uL and creatinine normal. Urine microscopy shows 10 red blood cells and 3 white blood cells per high power field. An abdominal ultrasound is ordered, with the only finding being mild right hydronephrosis.

What are the next steps in the evaluation and management of this patient?

Turn to page 34 to find out the answer.

**Table 1**

**Indications for urologic referral**

**Immediate**

- Fever
- Renal insufficiency
- Solitary kidney
- Severe hydronephrosis
- Stone size ≥ 10 mm
- Intractable pain or vomiting

**Delayed**

- Recurrent urolithiasis
- Cystine, uric acid or calcium phosphate stones
- Personal history of gout or bowel disease
- Strong family history of urolithiasis

## *Management*

Fever, severe hydronephrosis and renal insufficiency are indications for surgical intervention (Table 1). Otherwise, the goal of acute management is to provide effective analgesia. NSAIDs are favoured over opiates because they decrease the inflammation caused by an obstructing stone and are associated with lower rescue analgesic requirements at one hour and less side-effects.

*Fever, severe hydronephrosis and renal insufficiency are indications for surgical intervention.*

A second component of conservative therapy is facilitation of stone passage. Aggressive hydration does not improve stone passage rates and may increase pain, so the goal should be maintenance of euvolemia. Medical expulsive therapy (MET), which refers to the use of calcium channel blockers (CCBs) and α-blockers to facilitate stone passage, has gained favour over the past decade. A recent meta-analysis of 16 clinical trials showed a benefit with both α-blockers (risk ratio 1.59, number needed to treat 3.3) and CCBs (RR 1.50, NNT 3.9), although the risk of adverse events was higher with CCBs (15% vs. 4%). Although MET has been widely adopted into clinical practice, a large, well-designed randomized controlled trial is still lacking and perspectives may shift in the future.

**Table 2**

**Oxalate-rich foods**

- Beets, turnips
- Black tea
- Chocolate
- Nuts
- Spinach, kale, rhubarb
- Citrus fruits
- Grapes, cranberries

## *Prevention*

Urolithiasis should be viewed as a chronic disease whose morbidity can be decreased through secondary prevention. All patients presenting with their first episode of renal colic should undergo a simple metabolic evaluation consisting of serum measurements of calcium, phosphate, uric acid and if available, stone analysis. Patients with recurrent urolithiasis should undergo a comprehensive metabolic evaluation that includes a 24-hour urine collection.

First time stone formers should be treated conservatively, with increased fluid intake and dietary modifications. Fluid intake of 2 L per day has been shown to decrease the five-year stone

recurrence rate from 27% to 12%. Diets low in oxalate also decrease recurrence rates, while regular calcium intake has been shown to be superior to low calcium diets. Recurrent stone formers should be treated medically if a specific abnormality is detected on metabolic work-up.

## *Conclusion*

Urolithiasis is a common condition whose prevalence is increasing. While advances in imaging and MET have made the diagnosis and treatment of renal colic fast and effective, the real challenge will continue to be decreasing the prevalence of this chronic disease through secondary prevention.

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## Brian's case cont'd

A CT scan is ordered and shows a 5 mm stone in the distal right ureter. The patient is sent home with ketorolac suppositories and tamsulosin. He presents to your office a week later with stone in hand. Stone analysis reveals a calcium oxalate stone and he is counselled to increase his fluid intake and avoid oxalate-rich foods.

Resources
1. Diagnostic and Statistical Manual of Mental Disorders. Fourth Edition. American Psychiatric Association, New York, 1994. p.78-85.
2. The SNAP-IV Teacher and Parent Rating Scale (Swanson, JM): http://www.adhd.net/snap-iv-form.pdf. Accessed: July 7 2009.
3. National Initiative for Children's Healthcare Quality (NICHQ): http://www.nichq.org/. Accessed: July 7 2009.
4. UpToDate Editorial Team. Krull KR (author) Attention Deficit Hyperactivity Disorder In Children and Adolescents: Clinical Features and Evaluation AND Epidemiology and Pathogenesis: www.uptodate.com. Accessed: May 21, 2009 .
5. Clinical Practice Guideline: Diagnosis and Evaluation of the Child with Attention-Deficit/Hyperactivity Disorder. American Academy of Pediatrics. Pediatrics 2000; 105(5):1158-70.

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