

renal colic
[created by Paul Young 02/10/07]

definition
acute colicky flank pain radiating to the groin associated with passage of a ureteric stone
12% of the population have a urinary stone in their lifetime & recurrence approaches 50%

aetiology
1. radioopaque stones
2. radiolucent stones:
- uric acid stones
- matrix stones (made of organic material & seen in patients with urease producing bacteria)
- indinavir stones

symptoms
classical presentation is of acute colicky pain radiating to the groin
as the stone descends in the ureter, the pain may localise to the abdominal area overlying the stone & radiate to the groin
as the stone approaches the ureterovesical junction, lower quadrant pain radiating to the tip of the urethra, urinary frequency & urgency & dysuria are characteristic
owing to the shared splanchnic innervation of the renal capsule & intestines, hydronephrosis may produce nausea & vomiting
uric acid stones can be suspected based on history of gout

signs
vital signs:
- often hypertension & tachycardia are present
- patient rolls around the bed & tries to find a comfortable position
peritoneal signs are absent
tenderness over the costovertebral angle or lower quadrant may be present

investigations
1. MSU
- gross or microscopic haematuria occurs in approximately 90% of patients
2. imaging:
(i) CT
- sensitivity of CT approaches 100% & when CT is negative it reveals an alternative diagnosis in 57% of patients
(ii) KUB
- KUB should be performed when CT reveals the presence of stones or if CT is not available; 75-90% of urinary calculi are radioopaque
(iii) USS
- specificity is greater than 90% but sensitivity is only 11-24%
- an appropriate initial investigation in pregnancy

treatment

Urgent urological intervention is indicated for:
(i) obstructed infected upper urinary tract
(ii) impending renal deterioration
(iii) intractable pain or vomiting
(iv) anuria
(v) high grade obstruction of a solitary or transplanted kidney

A. treatment of infection:
- infection proximal to a stone is suggested by fever, urinalysis showing pyuria & bacteruria & leucocytosis. Impaired GFR associated with obstruction inhibits entry of antibiotics into the collecting system & requires emergency decompression by means of either percutaneous nephrostomy or ureteral stenting; E. coli is the most common organism & antibiotics should cover this

B. treat pain & nausea. treatments for pain include:
- ketorolac 30-60mg IV or IM loading dose then 15mg IV or IM every 6 hours
- diclofenac 50mg PO 2-3Xs/day
- morphine sulphate 0.1mg/kg IM or IV every 4 hours
NB: because intractable pain is caused by renal capsule distention, treatment is by decompression of the obstruction

C. likelihood of passage of ureteral stones
<2mm - pass in mean of 8 days & 3% need intervention
3mm - pass in mean of 12 days & 14% need intervention
4-6mm - pass in mean of 22 days & 50% need intervention
>6mm - unlikely to pass & 99% need intervention
NB: 2/3rds of stones will pass within 4 weeks of onset of symptoms; a stone which has not passed within two months is unlikely to. Furthermore, stones that are still symptomatic after 4 weeks have a complication rate of 20% (including renal deterioration, sepsis & ureteral stricture)

D. uric acid stones:
- uric acid stones are unique in that they can be managed medically with urinary alkalinisation; solubility of uric acid increases above 6.5
- Rx 20mmol of potassium citrate 2-3Xs/day with reassessment to ensure urinary alkalinisation to pH 6.5-7.0
- imaging can be repeated at one month to ensure that dissolution has occurred otherwise treatment should proceed as for a radioopaque stone

E. metabolic evaluation & prophylaxis
- renal deterioration is more likely from repeated episodes
- options for metabolic evaluation include:
(i) stone composition analysis
(ii) 24hr urine collection for volume, calcium, oxalate, uric acid phosphate, sodium, citrate, creatinine & sulphate +/- cystine
(iii) serum calcium & uric acid
- general advice includes restriction of animal protein & salt, drinking enough to produce 2L urine / day
- specific abnormalities should be treated