NEPHROLITHIASIS

Types of stones and risk factors (*Nat Rev Dis Prim* 2016;2:16008)

- **Calcium** (Ca oxalate >Ca phosphate): **70–90% of kidney stones** (*NEJM* 2010;363:954)
  - Urine findings: ↑ Ca, ↑ oxalate (Ca-ox only), ↑ pH (Ca-phos only), ↓ citrate, ↓ volume
  - 2° hypercalciuria: 1° hyperparathyroidism, distal RTA, sarcoid, Li use
  - 2° hyperoxaluria: Crohn's, ileal disease w/ intact colon, gastric bypass, pancreatic insuffic.
  - Diet: ↑ animal protein, ↑ sucrose, ↑ Na, ↓ K, ↓ fluid, ↓ fruits/vegetables, ↑ vit. C, ↓ Ca
- **Uric acid:** 5–10% of kidney stones, radiolucent on plain film
  - Urine findings: ↑ uric acid, ↓ pH (eg, from chronic diarrhea)
- **Magnesium ammonium phosphate** ("struvite" or "triple phosphate")
  - Chronic upper UTI w/ urea-splitting organisms (eg, *Proteus, Klebs*) → ↑ urine NH_3, pH >7
- **Cystine:** inherited defects of tubular amino acid reabsorption

Clinical manifestations

- Hematuria (absence does not exclude diagnosis), flank pain, N/V, dysuria, frequency
- Ureteral obstruction (stones >5 mm unlikely to pass spont.) → AKI if solitary kidney
- UTI: ↑ risk of infection proximal to stone; urinalysis of distal urine may be normal

Workup

- **Non-contrast CT** 97% Se, 96% Sp (ureteral dilation w/o stone suggests recent passage); U/S (Se 57%, Sp 98%) may serve as initial test in stable patient (*NEJM* 2014;371:1100)
- Strain urine for stone to analyze; U/A & UCx; electrolytes, BUN/Cr, Ca, PO_4, PTH
- 24-h urine × 2 (>6 wk after acute setting) for Ca, PO_4, oxalate, citrate, Na, Cr, pH, K, vol.

Acute treatment (*JAMA* 2020;323:1961)

POCKET NOTEBOOK

POCKET MEDICINE

EIGHTH EDITION

Marc S. Sabatine

The Massachusetts General Hospital Handbook of Internal Medicine

Wolters Kluwer

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