

Urolithiasis - Clinical aspects

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Outcomes

- Clinical picture and diagnosis of kidney stones
- Complications of stones
- Epidemiology and aetiology of stones
- Composition of stones
- Differential diagnosis
- Management

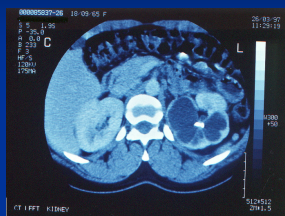
Case study

- History
 - 42 years old female
 - C/O pain Left Flank
 - Hematuria
 - Past history of stone Rx
 - Diabetic
- Examination
 - General
 - Febrile, pallor, (L) renal angle tenderness .

Investigations

- Laboratory
 - Urine dipstix & MC & S
 - FBC
 - U+E
 - Glucose
- Radiological
 - Sonar
 - CT scan(Non contrast spiral CT)

Ct scan



Management

- Intravenous Fluids
- Antibiotics
- Glucose control
- DMSA
- PCNL

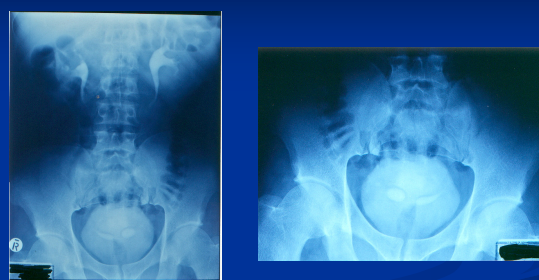
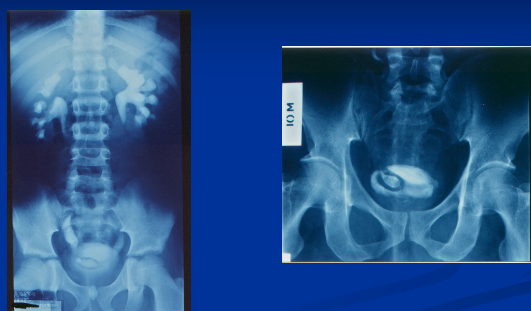
Where?

- Upper tract
- Lower tract
- Renal
- Bladder
- Ureter
- Urethra

Aetiology

- Factors for stone formation
 - Primary
 - Supersaturation of urine
 - Ionic strength
 - Solute concentration
 - Secondary factors
 - Urine stasis, infection e.g. PUJ obstruction

Ureterocolic



Bladder stones



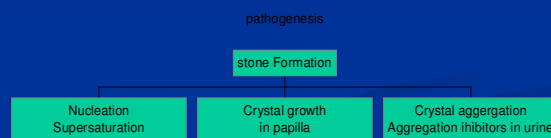
Radiology



Risk factors

- Intrinsic
 - Peak incidence – 20 – 40
 - Males:Females – 3:1
 - Race
 - Genetic
 - 25% have family history
 - Hereditary - cysteinuria, oxalosis
- Extrinsic
 - Geography
 - Seasonal
 - Occupation
 - Diet and water intake

urolithiasis



Clinical picture

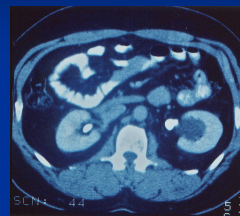
- Sudden pain
- Colic type pain
- Loin to groin
- Nausea – usually no vomiting
- Fever

history

- Age
- Hydration status past 6 months
- Previous stone disease
- Family history of stone disease
- Hyperparathyroidism
- Malignancy
- Sarcoidosis – Granuloma produces Vit D
- Glucocorticoid therapy
- Immobilization
- Short bowel syndrome

- Diabetes mellitus
- Iatrogenic hypercalcemia
 - Thiazide diuretics
 - Lithium
 - Absorbable alkali
 - Excessive Vit D and Vit A
- Renal tubular acidosis
 - Distal : type 1
 - First morning urine pH > 5.5

- Prevalence 1- 15%
- Risk of recurrence
 - 7 % within one year
 - 50% rest of life
- Complications
 - Individual- infection, renal function, squamous cell ca
 - Economic implications



Special investigations

- Who to investigate?
- Serum Phosphate, Ca^{++} , Urate
- Stone analysis
- Urine - pH, 24 hr collection – volume, citrate levels calcium oxalate excretion

Composition of stones

- | | |
|--|--|
| <ul style="list-style-type: none"> ■ Calcium stones <ul style="list-style-type: none"> ■ Majority of stones ■ radio opaque due to Ca^{++} <ul style="list-style-type: none"> ■ Calcium oxalate ■ Calcium phosphate ■ Calcium carbonate | <ul style="list-style-type: none"> ■ Noncalcium stones <ul style="list-style-type: none"> ■ Uric acid stones ■ oxalate ■ struvite ■ Cysteine ■ Rare-Matrix, xanthine, indinavir |
|--|--|

Calcium stones

- Hypercalciuria – 30-60% normocalcaemic
- Types ---
 - Absorptive
 - Resorptive
 - Renal
 - idiopathic

Calcium stones cont

- Hyperuricosuria
 - Endogenous or exogenous
- Hyperoxaluria
 - Primary
 - Secondary - enteric
- Hypocitraturia
 - Renal tubular acidosis
 - Thiazide Rx
 - chronic diarrhoea

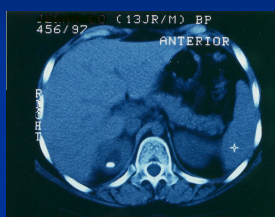
Differential diagnosis

- Acute appendicitis
- Ectopic pregnancy, PID, Ovarian diseases
- Abdominal aortic aneurysm
- bowel obstruction, diverticular disease,
- Peptic ulcer ds, cholecystitis
- Pancreatitis
- Lower lobe pneumonia

Investigations

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Laboratory <ul style="list-style-type: none"> ■ Urine dipstix & MC+S ■ Urea and electrolytes ■ FBC | <ul style="list-style-type: none"> ■ Radiological <ul style="list-style-type: none"> ■ Sonar ■ Ct scan ■ ?IVP ■ ?Renogram |
|--|---|

Non-contrast Ct scan



Treatment

- Objectives
 - Pain control
 - Treat the infection
 - Relief of obstruction
 - Clearance of stones
 - Prevention of recurrence

Medical

- Uric acid stones
- Ureteric stones

Surgical treatment

- Endoscopic
- ESWL
- Percutaneous
- laparoscopic
- Open surgery

Early intervention

- Intractable pain
- renal failure
- infection
- complete obstruction
- Bilateral stones or in a solitary kidney

Special clinical scenario

- Pregnancy
- Obesity
- Paediatrics

Prevention

- Fluid intake
- Citrate intake
 - 2 liters of water + 120ml of lemon juice
- Decrease salt intake, protein intake, Oxalate intake & Calcium intake
- Treatment of the primary cause

Thank you



AXR

