Tuberculosis of Urinary tract

Dept Of Surgery

Etiology

- Peak incidence in 20-40 age group worldwide
- Male-female ratio 2:1
- Virulence of mycobacterium strain
  - Cord factor - inhibits granuloma formation
  - Sulphatides - impairs macrophage phagocytosis
  - Lipoarabinomannan – inhibits macrophage killing
- Host factors - immunocompromise

Microbiology

Mycobacteria

- 2.4 um long x 0.5um wide
- Non-motile, non-flagellated
- Strict aerobes
- Thick cell wall containing 4 complex layers of approx 50% lipids
- Very difficult to stain (hot carbolfuschin)
- Stain is ‘fast’ to acid or alcohol
- Very slow growing – doubling time 16-20 hrs

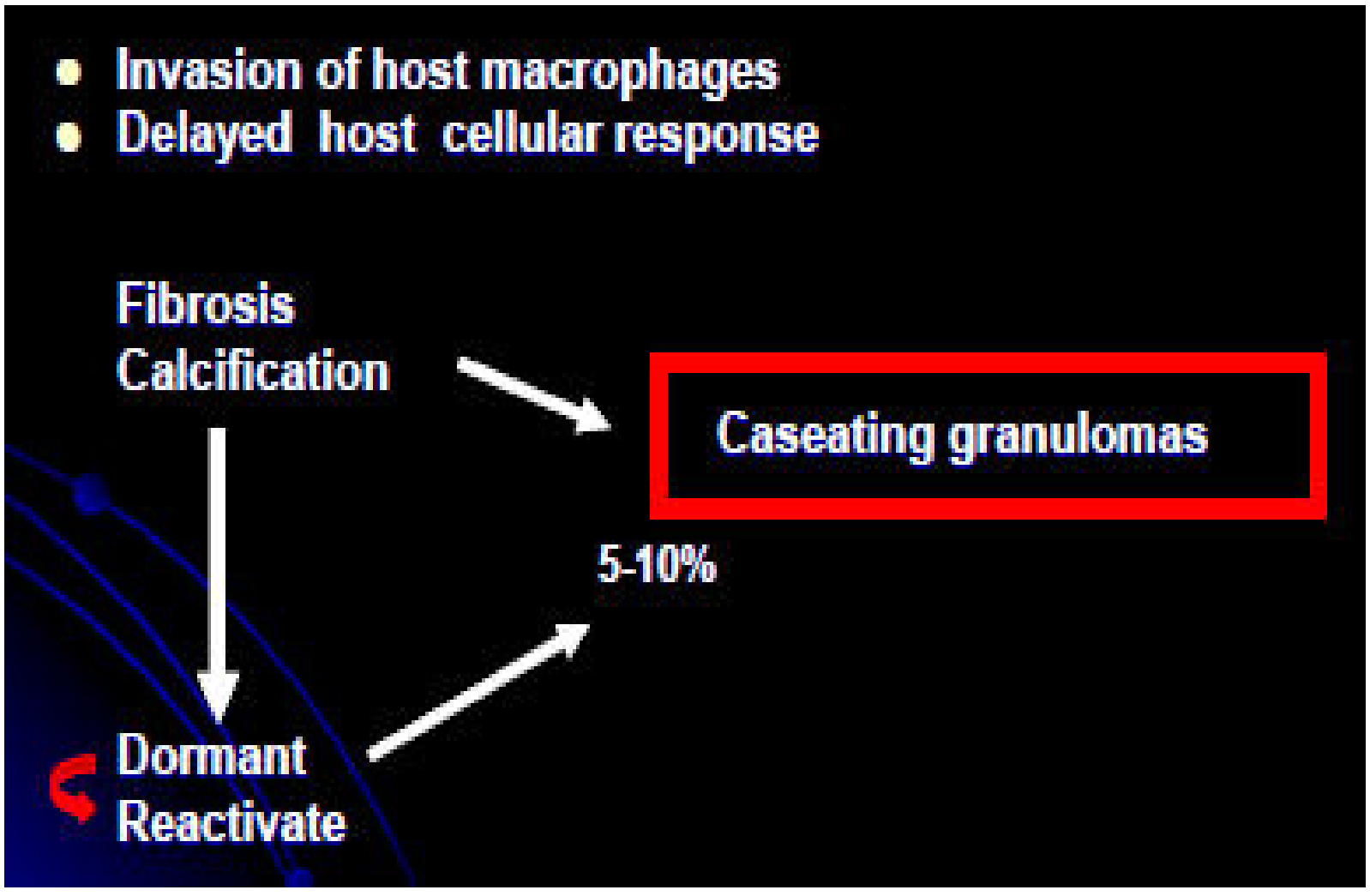
4 mycobacteria strains cause human tuberculous disease

- *M. tuberculosis*
- *M. bovis*
- *M. leprae*
- *M. africanum*

Mycobacteria tuberculosis accounts for most of the disease

Humans are the only reservoir of the disease

Pathogenesis



Clinical presentation

- Frequent painless micturition
- LUTS
- Sterile pyuria, 20% without pyuria
- Gross hematuria 10%, microscopic hematuria 50%
- Renal or suprapubic pain

Renal TB

- Renal TB is caused by the activation of a prior blood borne renal infection
- Healing process results in fibrous tissue and calcium salts being deposited
- Papillary necrosis and strictures in the calyceal stem

KUB radiographic view in a patient with left renal tuberculosis with associated calcifications

Ureter TB

- Tuberculous ureteritis is always an extension of the disease from the kidney
- Leads to fibrosis and stricture formation
- Site most commonly affected is the ureterovesical junction (UVJ)

Stricture at the distal left ureter

Bladder TB

- Earliest forms of infection start around one or another ureteral orifice

- Healed mucosal lesions have a stellate appearance

Diagnosis

Urine Examination

- Urine culture (3-5 specimen)

- Tuberculin Test

- Radiography
  - Plain Radiographs
  - Intravenous Urography
  - Computed Tomography (**gold standard tool)**
  - Cystoscopy and Biopsy (**rarely indicated)**
  - Retrograde Pyelography
    - **stricture at the lower end of the ureter**
    - **ureteral catheterization**
  - Percutaneous Antegrade Pyelography
  - Arteriography, Radioisotope Investigation and MRI

CT after oral contrast medium with bilateral tuberculosis

Management

Antitubercular drugs:

- Multidrug treatment
- 6 to 9 months (Iseman, 2000)
- Rifampicin, INH, pyrazinamide, and ethambutol

Surgery

- Current focus is on organ preservation and reconstruction
- Delayed until medical therapy has been administered for at least 4 to 6 weeks

Nephrectomy

- **Indications**
  - nonfunctioning kidney with or without calcification
  - extensive disease involving the whole kidney, together with hypertension and UPJ obstruction
  - coexisting renal carcinoma

Partial Nephrectomy

- Localized polar lesion containing calcification that has failed to respond after 6 weeks of intensive chemotherapy
- Area of calcification slowly increasing in size and may gradually destroy the whole kidney

Reconstructive Surgery

- Ureteral Strictures: entire stricture should be excised
- Augmentation Cystoplasty
- Urinary Conduit Diversion
- Orthotopic Neobladder