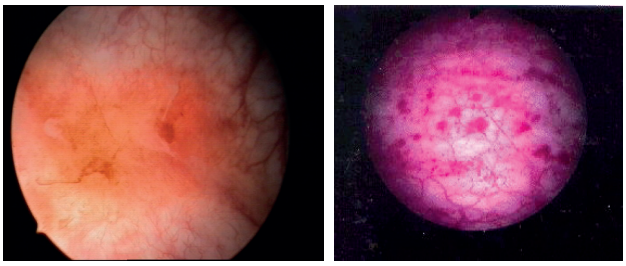
Infections and inflammation: part 2

Case 1

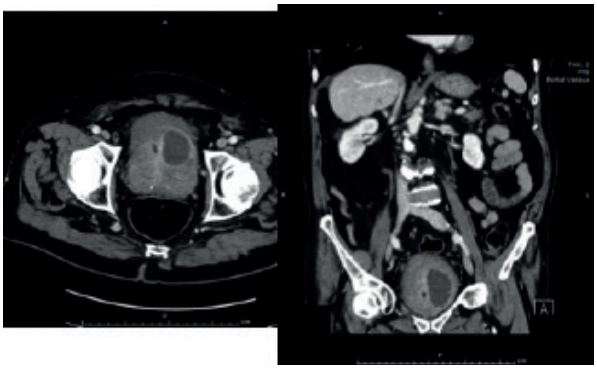
A 43-year-old lady presented to the urologist with a history of pain during bladder filling and associated frequency / urgency. She underwent standard microbiological and radiological investigations that are normal. She proceeded to a cystoscopy + bladder distension to investigate her pain.



1. What are the appearances seen in Figure 1 and 2? What is the likely diagnosis at this stage?
2. List other conditions that must be excluded before a diagnosis can be established.
3. How can this disease be classified?
4. What are the potential pathophysiological mechanisms for this disease?
5. List potential treatment options available to manage this condition.

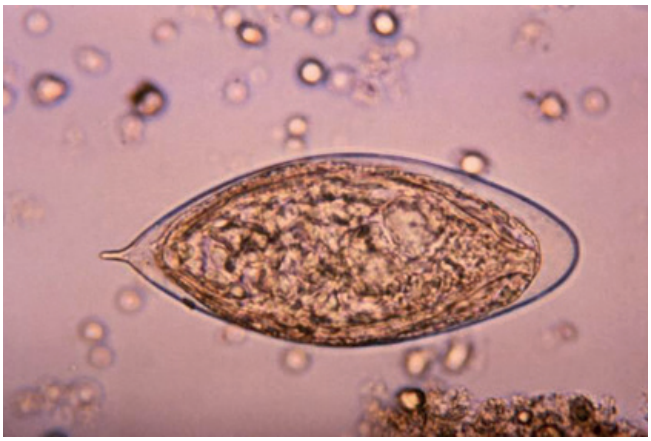
Case 2

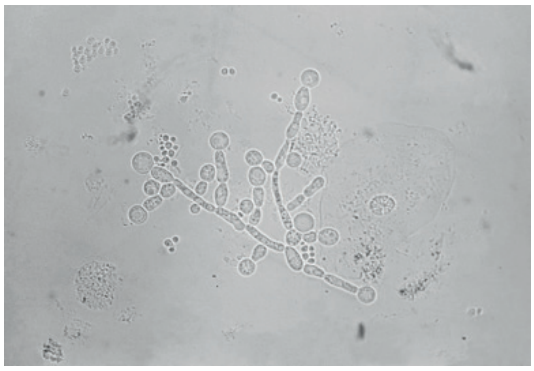
An 82-year-old diabetic man with a long-term catheter presented to the Emergency Department with rigors and non-specific abdominal pain. He had an elevated white cell count (WCC) and C-reactive protein (CRP). An abdominal and pelvic CT scan was arranged. Selected CT images are shown below:



1. Describe the CT findings. What is the diagnosis?
2. What is the pathophysiology of this condition?
3. What are the risk factors?
4. What is the most likely causative organism?
5. How can it be drained?

Case 3





Above are some selected infective microorganisms seen in urological practice.

1. Name the organism based on the images shown?
2. What are the normal host defence mechanisms to prevent urinary tract infection (UTI)?
3. How common is asymptomatic bacteriuria? When should it be treated?
4. How do you manage a patient with asymptomatic candiduria?
5. What are the common risk factors for candiduria?

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Infections and Inflammation: part 2 – answers

Case 1

1. Figure 1: Hunner's ulcer. Figure 2: post distension glomerulations.
   Interstitial cystitis / bladder pain syndrome (BPS).
2. Cystitis: microbiological / chemical / radiation / drug (cyclophosphamide).
   Overactive bladder syndrome / detrusor overactivity.
   Malignancy: urological / gynaecological / abdominal / pelvic.
   Endometriosis / uterine fibroids.
3. BPS is classified on cystoscopic appearances by the ESSIC into normal (grade 0), glomerulations grade II-III (grade I denoted petechiae in at least two quadrants), and Hunner's lesions. Cystoscopy findings combined with histological on biopsy enables a more detailed classification as per the ESSIC guidelines.
4. Mast cell release of histamine, defective GAG layer of bladder with consequent abnormality of urothelial permeability, neurogenic mechanism, reflex sympathetic dystrophy of the bladder, autoimmune response and urinary toxins.
5. Behavioural: patient education, dietary modification (avoidance of triggers: citric fruit, tomatoes, vitamin C, coffee / tea, spicy food, alcohol, caffeine), stress reduction, pelvic floor rehabilitation through physiotherapy.
   Medical: H2 antagonists, epithelial repair (pentosan polysulfate), inhibit neural activity (amitriptyline), nonsteroidal anti-inflammatory drugs / paracetamol.
   Intra-vesical: dimethyl sulfoxide (DMSO), combined GAG replacement therapy, alkalinised lidocaine.
   Surgery: resect Hunner's lesions, bladder augmentation / diversion / cystectomy.
   Other options: BTX-A with hydrodistension, oral cyclosporine A

Case 2

1. There is a peripherally enhancing collection in the left anterosuperior aspect of the prostate. Diagnosis: left sided prostatic abscess.
2. Infected urine reflex into the prostate, haematogenous spread (commonly *Staph aureus*), direct spread (transrectal ultrasound guided biopsy).
3. Diabetes, immunocompromised (steroids / HIV / chemotherapy), chronic bacterial prostatitis, long-term catheter.
4. *E. coli* (up to 80%), other enterobacteriaceae (*Klebsiella, Enterobacter* and *Serratia* species) (3-11%), Proteus species (5%), *Pseudomonas aeruginosa* (5%).
5. Transurethral drainage (selective transurethral resection of the prostate over abscess) or perineal aspiration and drainage under radiological guidance.

Case 3

1. Figure 1: *E.coli* (clue: rod shaped).
   Figure 2: *Schistosoma haematobium* (clue: terminal spine).
   Figure 3: *Candida albicans* (clue: spore forming).
2. Host defence: antegrade flow of urine, acidic urine, exfoliation of epithelial cells, lactobacillus of vagina, intact GAG layer, Tamm-Horsfall protein (uromodulin) - binds Type 1 pilli of *E.coli.*
3. Up to 5% of patients. Treat during pregnancy (4-7% incidence) as increased risk of pyelonephritis (20-40% will develop pyelonephritis).
4. No treatment is needed unless the patient is high-risk (neutropenia, low birth weight infant) or undergoing urological manipulation. Symptomatic patients must be treated.
5. Indwelling catheters and stents, elderly age, antibiotic use, neutropenia, underlying gastrointestinal tract abnormalities, previous surgery and diabetes.