Epididymitis is an inflammatory condition of the epididymis, which can also involve the testis (epididymo-orchitis). This manifests itself clinically as acute hemiscrotal pain and swelling (Figure 1), usually secondary to bacterial infection, but it may have non-infectious causes, particularly in children (Box 1). Alternatively, it may present as a chronic painful relapsing/remitting condition.

CAUSES OF EPIDIDYMOM-ORCHITIS

The majority of cases are of bacterial origin (Gram-negative coliforms, particularly Escherichia coli), arising from urinary bladder, prostate or urethra and then refluxing via the ejaculatory ducts and vasa deferentia into the epididymis. The inflammatory response usually commences in the tail of the epididymis as it has the greatest blood supply, before spreading to the body, head and testis. Obvious risk factors include urinary tract infection, bacterial prostatitis, an underlying congenital abnormality (in children), instrumentation/catheterisation, and urinary stasis as a result of bladder outlet obstruction.1

In sexually active men, particularly under the age of 35 years, sexually transmitted infections are the most common cause (46 per cent if under 35 versus 7 per cent if over 35), with Chlamydia trachomatis and Neisseria gonorrhoeae the obvious pathogens.2 Infection may have occurred months previously.

In addition, mumps orchitis is on the rise, as a result of the decline in vaccinations over the past few years.3–5 Around 20–30 per cent of infected postpubertal males suffer from this complication as a result of haematogenous spread, generally 4–11 days after the onset of parotitis. The viral infection then spreads to the epididymis, and in 10–30 per cent, bilateral orchitis occurs. Severe infection may result in testicular atrophy, presenting up to a year later, and infertility (if mumps orchialgia is bilateral). Antibiotic therapy should be given, as a bacterial cause may not be entirely ruled out and to reduce the risk of secondary bacterial infection (even with an obvious clinical diagnosis of mumps orchitis).4

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In susceptible risk groups, epididymo-orchitis may be the only focus of genitourinary tuberculosis, where it presents as a painless, slightly tender scrotal mass and, in some instances, abscess formation. The epididymis, vas and spermatic cord become ‘beaded’ on palpation in chronic cases. Infection is thought to result from direct extension from the prostate and seminal vesicles, but haematogenous spread may also occur. 

Chronic epididymitis (symptoms for more than six weeks) results in around 15 per cent of acute episodes. As with chronic cystitis or recurrent urinary tract infection, it may be caused by an inadequately treated initial infection (eg a persistent bladder or prostatic source), resulting in relapse/ persistence of symptoms. Alternatively, these may be the result of true de-novo recurrent infections, usually because of an underlying risk factor.

Differential Diagnosis

Patients present classically with acute pain and swelling, with localised tenderness in the epididymis, with or without involvement of the testis and spermatic cord (with pain radiating to the groin/lower abdomen). The swelling may eventually result in a global red hemiscrotal mass, with the testis indistinguishable from the epididymis. The overlying skin may become erythematous and a reactive hydrocoele may also result. Systemic symptoms, particularly a temperature, can occur. In addition patients may have co-existing or preceding symptoms of prostatitis, urethritis or cystitis, depending on the source of infection.

Although epididymitis should always be considered in the differential diagnoses for a patient presenting with acute scrotal pain, it is essential to exclude testicular torsion, particularly in the adolescent age group. Differential features are listed in Table 1, but it is important to bear in mind that testicular torsion is the cause of 90 per cent of cases of acute scrotal pain in patients between 13 and 21 years. Testicular torsion can also occur in older patients, and therefore surgical exploration must be considered the ultimate investigative measure when any doubt exists.

Testicular tumours may also present in a similar fashion, particularly if the rete testis is involved (resulting in tubular obstruction and pain). In addition, haemorrhage and superimposed infection may also result in pain and swelling, precluding adequate palpation of the underlying testicular lesion. As a result, up to one-third of cases may be treated with antibiotics initially, delaying referral and definitive management. Other differentials include trauma to the testis with resulting haematocoele and possible breach of the tunica albuginea (requiring ultrasonic assessment or surgical exploration if any doubt exists).

Fournier’s gangrene (necrotising fasciitis of the scrotum and perineum) should also be borne in mind with regards to scrotal pain and swelling, particularly for high-risk groups, eg patients with diabetes, immobilised with multiple medical comorbidities. It presents with a classic triad of severe pain (out of proportion to the physical findings), swelling and fever. The infective process involves a subcutaneous synergistic infection with secondary cellulitis (non-blanching) and gangrene of the overlying skin, with no involvement of the tests and epididymis. Prompt radical surgical debridement is required to prevent progression to septic shock, multi-organ failure and death.

In addition, referred pain from a ureteric stone can present in a similar fashion when no localising signs are present despite acute pain. Non-urological causes would include acute incarcerated inguino-scrotal hernia.

Chronic infective epididymitis may be difficult to differentiate from epididymyalgia/orchialgia in terms of clinical signs, in a similar fashion to...
Chronic prostatitis/pelvic pain syndrome. There may be an indurated, thickened or even hard epididymis, which may require ultrasonic follow-up to rule out a rare adenomatoid tumour. Finally, a history of previous vasectomy may implicate postvasectomy discomfort/syndrome as a potential source of symptoms (present in 10–15 per cent of patients following vasectomy). In all such cases, intermittent relapsing or almost constant symptoms may well have a considerable impact on quality of life.

**INVESTIGATIONS**

Baseline investigations for suspected epididymo-orchitis (with no suspicion of testicular torsion) include:

- Urinalysis and midstream specimen urine
- Gram staining – urine/urethral smear – to look for intracellular Gram-negative diplococci (N. gonorrhoea) or white cells (C. trachomatis in two-thirds), particularly if urethral discharge is present
- Urethral swab for culture and sensitivity (prior micturition), or urine polymerase chain reaction for C. trachomatis and N. gonorrhoea
- Serum inflammatory marker if sepsis, monitor response as inpatient
- Ultrasound with Doppler flow to confirm hyperaemic testicle/epididymitis. This should be used as an adjunct and not to exclude torsion, as ultrasound is only 80 per cent sensitive for diagnosing torsion.

Additional investigations include:

- Intravenous urogram – if ureteric colic is suspected (eg normal clinical examination with testicular pain)
- Flowmetry and postvoid residual (or formal prostate/lower urinary tract symptoms assessment) in men over 50 years old.

**MANAGEMENT**

Baseline management for acute epididymo-orchitis is summarised in Box 2.

For chronic cases, intermittent therapeutic trials of prolonged (4–6 weeks) antibiotics similar to chronic prostatitis with non-steroidal analgesia may be sufficient in some cases. When infective causes have been excluded, referral to a chronic pain specialist should be considered. Chronic pain specialists use neuromodulatory analgesics (eg gabapentin, pregabalin and amitriptyline) and nerve/cord blocks with variable success. It is important to emphasise to patients that surgical interventions (ultimately orchidectomy) may not lead to resolution of symptoms, although reversal of vasectomy and even epididymectomy may achieve a degree of success in postvasectomy orchialgia. Indications for referral are summarised in Box 3.

Complications are uncommon, but may include abscess formation, requiring surgical drainage; ischaemia/infarction, resulting in atrophy; persisting hydrocoele; chronic epididymitis/chronic pain, and infertility.

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**BOX 2. Acute treatment of epididymo-orchitis**

**CONSERVATIVE**
- Bed rest/scrotal elevation and support

**ANALGESIA**
- Non-steroidal anti-inflammatory drugs

**ANTIBIOTICS**
- Treat empirically until culture and sensitivities return to avoid progression/complications, as per local drug policies for regimen.
  
  For example:
  - Over-35s (sexually transmitted infection unlikely)
    - Oral fluoroquinolone (allows for superior tissue penetration) or co-amoxiclav for 10–14 days
    - Intravenous co-amoxiclav ± gentamicin if inpatient for sepsis
  - Under-35s (sexually transmitted infection more likely)
    - Doxycycline 100mg twice daily (or levofloxacin for more broad-spectrum cover) for 14 days

**STEROID THERAPY**
- Recommended in European Association of Urology Guidelines in young men to reduce infertility risk, but not currently standard UK practice
  - Methylprednisolone 40mg/day, and reduce the dose by half every second day

**BOX 3. Indications for referral**

- Suspected torsion
- Symptoms not resolving with treatment in terms of antibiotic courses and pain control
- Suspected septicaemia or abscess formation
- Genitourinary medicine assessment if sexually transmitted infection suspected (contact tracing, etc.)
- Paediatric urological assessment in young for any congenital abnormalities – if recurrent problem (as with urinary tract infections)
- Suspected chronic epididymitis where symptoms have not resolved with simple analgesics and prolonged repeated antibiotic courses – to rule out anatomical sources of recurrent infection (prostate/bladder)
CONCLUSION

Epididymo-orchitis is a common urological condition presenting to both primary and secondary care. Although the majority of cases resolve with antibiotics, it is important to be aware of potential complications and alternative diagnoses as these can lead to long-term morbidity.

Declaration of interests: none

REFERENCES


