

Painful Scrotum

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Introduction

Scrotal pain is a common symptom, and when faced with a man with this complaint the differential diagnosis is diverse. The list of causes can be broken down into infective and non-infective.

Infective causes

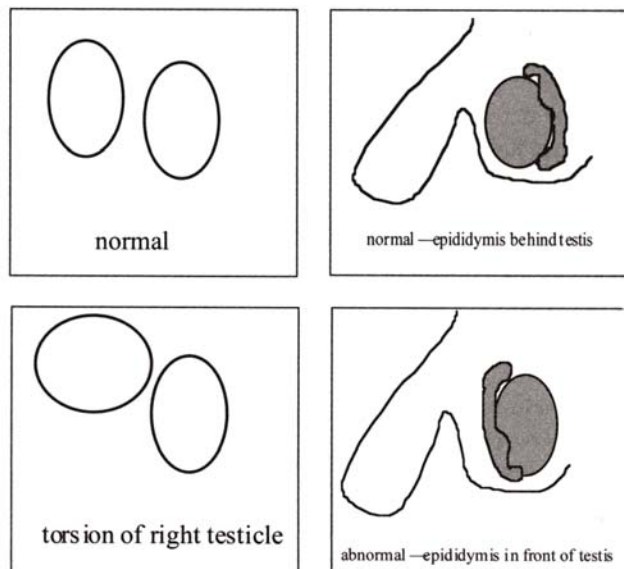
Epididymo-orchitis	C. trachomatis,
Sexually acquired organism:	N. gonorrhoeae, E. coli (from insertive anal sex)
Non-sexually acquired organism:	E. coli (from a UTI) Pseudomonas aeruginosa Mycobacteria tuberculosis Brucella spp. Epstein-Barr Virus Mumps – just orchitis, after puberty
Scrotal abscess	

Non-infective causes

Torsion of testis	
Trauma	although trauma can also trigger torsion of testis
Torsion of testicular appendix	
Torsion of epididymal appendix	
Tumour	benign malignant
Strangulated hernia	
Varicocoele	usually more of a dragging sensation
Granulomatous epididymo-orchitis	a late complication of vasectomy
Drugs	Amiodarone
Referred pain	renal tract calculus leaking aortic aneurysm
Psychological	
Behçets disease	

This section of the manual is not intended to be a comprehensive algorithm

for diagnosing the cause of scrotal pain. The aim is to offer some tips for distinguishing between two of the commonest and most acutely serious conditions: torsion of the testis; and epididymo-orchitis.



The physical findings are schematically shown above. Normally the epididymis is behind the testis, and the testis hangs with its long axis up and down. In torsion you may find the twisted testis higher (though one is usually higher by a small amount) and horizontal. The epididymis may be rotated to the front

Literature search strategy

Medline 1994-May 2001 was searched using the strategy ((testi* OR spermatic cord) AND torsion) OR acute scrotum, limit = review. Current national STI (sexually transmissible infection) guidelines for the management of epididymo-orchitis/scrotal pain were searched from Australia, United Kingdom and the United States of America. The Australian Antibiotic guidelines were searched, as were relevant major textbooks.

Explanation and expansion of the guideline

The start of the section highlights that a painful scrotum should be taken seriously. This is because of the possibility of testicular torsion, which can cause infarction (death of the testicle by cutting off its blood supply) in a matter of hours.¹ It is often very difficult to confidently exclude torsion. This is because the oedema, which quickly occurs with severe epididymitis or torsion, makes it hard to feel the things inside. If torsion cannot be confidently excluded the man should be referred immediately for exploratory surgery, even if it is the middle of the night.

Testicular torsion occurs when the testicle rotates and twists the spermatic cord (which contains the blood supply to the testicle). Men with an unusually spacious tunica vaginalis (the pouch which holds the testicle) are at particular risk of this happening since it allows the testicle to move around more freely.

Epididymitis is inflammation of the epididymis, if the infection spreads to the testis it is called epididymo-orchitis. Management and treatment are the same for both conditions, so the rest of this document just refers to

epididymitis to make it easier to read. Epididymitis is a serious condition since, if left untreated, it might result in infertility although this is unlikely if the infection is just on one side.

Age

Torsion can occur at any age but is more common in people aged less than 20. If a pre-pubertal boy has testicular pain he should be considered to have torsion until exploratory surgery has shown otherwise because epididymitis is uncommon in this age group.² In younger sexually active men epididymitis is usually caused by sexually transmitted organisms, in older men it is usually caused by gram-negative enteric (i.e. from the gut) bacteria that cause urinary tract infections. This is more likely if the man has had urological surgery, urethral instrumentation (such as a catheter) or if he has an anatomical abnormality.

The UK³ and the USA⁴ guidelines choose a cut-off age of 35 years to distinguish between these groups although they acknowledge that there will be a lot of crossover between them. The Australian STI management guidelines⁵ don't mention enteric organisms as a possible cause and so don't mention a likely age. The Australian Therapeutic Guidelines: Antibiotic⁶ discuss enteric organisms but again don't give a cut-off age. In the population covered by the CARPA manual it is perhaps unrealistic to recommend a clear age cut-off for deciding whether a man has an STI or an enteric infection. STIs are common in the CARPA region, and so people presenting with epididymitis should be treated as if they have one unless the history and other findings strongly suggest that an enteric organism is the cause.

How it starts

Half of people with torsion give a history of similar episodes that have resolved spontaneously. Half report sudden onset pain, peaking in severity after seconds or a few minutes, which might wake them from sleep. Sometimes there is a history of trauma prior to the onset of pain; this can cause confusion, making the examiner think that the pain was directly due to the injury.

The pain of epididymitis usually starts gradually over hours as the infection develops but in a study of 92 US servicemen the pain started suddenly in a third.⁷

Pain

Torsion doesn't always cause severe pain and sometimes pain can be felt in the lower abdomen. Epididymitis can cause inguinal pain and, in severe cases, flank pain.

Fever

A raised temperature makes epididymitis more likely, but many people with epididymitis have a normal temperature.

Other symptoms

One of the first symptoms of torsion can be nausea starting at the same time as the pain.

If the man has symptoms of urethritis, dysuria or a discharge then the diagnosis is likely to be epididymitis. Often the urethritis is asymptomatic - perhaps because the scrotal pain gets his attention more

than the urethral symptoms. Don't forget that he could have torsion and epididymitis.

Examination

Remember that the left testicle is usually lower than the right and it is often slightly larger. In torsion the testicle is often so tender that the man will be very reluctant for you to touch it but you might find that the torted side is sitting higher in the scrotum and lying horizontally. If the epididymis is in front of the testis on the unaffected side it is an indication of a lax tunica vaginalis – the congenital abnormality that makes torsion possible. This suggests that the cause of the symptoms on the other side might be torsion as opposed to epididymitis.

When examined early in the course of epididymitis it should be possible to identify a swollen epididymis – the swelling usually starts at the lower pole. When the infection spreads, the inflammation and secondary hydrocoele can make it difficult to determine anatomy.

Lifting the scrotum

Any extra pressure on the testicle will make the pain worse in a case of torsion. In epididymitis scrotal support can ease the pain; men should therefore be advised to wear supportive underpants rather than shorts.

Urinalysis

This will be normal in torsion unless there is coexisting urethritis or testicular infarction has occurred.

Colour Doppler ultrasound

This is available in some centres and can be a useful test for diagnosing torsion with sensitivity of 82-89% and specificity of 90-99% being reported.⁸ False negatives occur, and the test is probably best reserved for people with an equivocal or low probability of torsion. If torsion is likely clinically they should have exploratory surgery without waiting for an ultrasound.

Treatment

It is important to give sufficient analgesia since the pain can be excruciating. If torsion cannot be confidently excluded, refer for surgery immediately because the testicle needs to be untwisted as soon as possible. Manual untwisting is effective at restoring blood supply to the testicle when immediate surgery is not possible^{9,10} and can be attempted if the clinician is familiar with the procedure. The testicle usually needs to be rotated laterally and may need up to three full turns before it is untwisted. This will probably be extremely painful so pain relief such as IV/IM morphine or Entonox (nitrous oxide and oxygen) will be needed. When fully untwisted the pain improves rapidly. The man still needs to have surgery to fix the testes in place or else torsion will recur.

There is little consensus on the best treatment for epididymitis.

For epididymitis most likely caused by N. gonorrhoeae or C. trachomatis.

The Australian STI management guidelines recommend:

- ceftriaxone 250 mg IM once daily or ciprofloxacin 500 mg orally once daily PLUS
- doxycycline 100 mg orally twice daily. Patients should take 'both for three to five days or until there is clinical improvement. Treatment can then be continued with doxycycline alone for a total of 21 days.'

The US (Center for Disease Control) guideline recommends:

- ceftriaxone 250 mg IM in a single dose, PLUS
- doxycycline 100 mg orally twice a day for 10 days.

The UK (Medical Society for the Study of Venereal Diseases) guideline recommends:

- ceftriaxone 250 mg IM single dose or ciprofloxacin 500 mg orally single dose PLUS
- doxycycline 100 mg orally twice daily for 10-14 days

And the Australian Therapeutic Guidelines: Antibiotic recommend (where penicillin-resistant *Neisseria gonorrhoeae* is uncommon [prevalence <5%]):

- amoxicillin 500 mg orally, eight-hourly for 10-14 days PLUS
- doxycycline 100 mg orally twice daily for 10-14 days

Otherwise:

- ceftriaxone 250 mg IM single dose OR ciprofloxacin 500 mg orally single dose PLUS
- doxycycline 100 mg orally twice-daily for 10-14 days (i.e. the same as the UK guideline)

(If someone is treated as having STI but is later found or suspected to have an enteric infection then the ceftriaxone or ciprofloxacin should be continued for 10-14 days.)

This guideline comments that if adherence to two weeks of doxycycline is likely to be suboptimal there are theoretical grounds to suggest that it could be replaced by azithromycin 1 g on days one and eight although no clinical trial has assessed this.

Strangely, the WHO STI¹¹ guidelines recommend treatment as for uncomplicated *N. gonorrhoeae* and *C. trachomatis*. For example, 1 g Azithromycin and 500 mg Ciprofloxacin.

For epididymitis probably due to enteric organisms.

The US guideline recommends:

- ofloxacin 300 mg orally twice a day for 10 days. (This can also be used for treating gonorrhoea or chlamydia if the patient is allergic to cephalosporins and/or tetracyclines). Unfortunately, ofloxacin is not available under the PBS.

In this situation the UK guideline recommends:

- ofloxacin 200 mg by mouth twice daily for 14 days OR ciprofloxacin 500 mg by mouth twice daily for 10 days

The Australian STI management guidelines do not make a recommendation for this situation.

The Australian Therapeutic Guidelines: Antibiotic recommend:

Mild to moderate infection:

- Trimethoprim 300 mg orally daily for 14 days OR amoxicillin + clavulanate 875/125 mg orally, 12 hourly for 14 days OR cephalexin 500 mg orally, six-hourly for 14 days

If resistance to the above organisms is suspected or proven use:

- Norfloxacin 400 mg orally 12-hourly for 14 days

Severe infection:

- Amoxy/ampicillin 2 g intravenously, six-hourly PLUS
Gentamicin 4-6 mg/kg intravenous daily (tailored to age and renal function)

Continue until substantial improvement then change to appropriate oral agent to complete two weeks of treatment.

The CARPA STM guideline recommends 250 mg ceftriaxone intramuscularly as a one-off dose. This will be enough to treat epididymitis caused by *N. gonorrhoeae* and will cover most enteric organisms such as *E. coli*.

A Medline search (Medline 1994-May 2001 epididymitis AND azithromycin) failed to find any trials of azithromycin for treating chlamydial epididymitis but it is known to be very effective at treating uncomplicated chlamydia infection. Using it with doxycycline will therefore increase the chance that at least some anti-chlamydial antibiotics will be taken, since compliance with doxycycline is often poor.

There is no evidence to say how long the course of doxycycline must be to eradicate *C. trachomatis*. The available guidelines suggest 10-21 days of therapy as being sufficient. The CARPA guideline recommends 14 days since this is convenient to administer.

Follow-up

It is important to follow up men who were not sent for surgery to check that they're improving with the antibiotics. A proportion of them will have torsion or intermittent torsion and could still benefit from referral to a surgeon for orchidopexy (fixing the testicle in place if it's still alive) or orchidectomy (removing it) if it's dead.

A further review at one week is important. This is an opportunity to give him the results of the STI check-up and to make sure he's taken the doxycycline. If he hasn't taken sufficient doxycycline, a second dose of azithromycin should be enough to clear any persisting chlamydial infection.

The results of urine culture should be available within one week. If there has been a heavy growth of an enteric bacteria, such as *E. coli*, then the antibiotics should be changed according to the sensitivity of the organism.

[Editorial committee comments: Use of ciprofloxacin for men having had procedures is likely to be fairly rare so no concerns about selection pressure for resistance and is the recommended best treatment.]

In addition, the committee states:

'In situations when an enteric organism is a likely cause e.g. if there is a urinary tract abnormality or recent urethral instrumentation in an older man [who isn't sexually active] then the doctor with whom the patient is discussed might suggest using ciprofloxacin. Otherwise the man should be treated for a sexually transmitted cause in the first instance and

consideration should be given to treating with ciprofloxacin if his symptoms are slow to resolve or if the results of lab tests indicate it.'

Follow-up

It is important to follow up within 24 hours men who were not sent for surgery to check that they're improving with the antibiotics. A proportion of them will have torsion or intermittent torsion and could still benefit from referral to a surgeon for orchidopexy (fixing the testicle in place if it's still alive) or orchidectomy (removing it) if it's dead.]

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