

Investigating and managing chronic scrotal pain

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Few data are available on the true incidence of chronic scrotal pain and most figures relate to post-vasectomy pain syndrome. However, a crude incidence of 350-400 cases of chronic scrotal pain per 100 000 men per year has been estimated on the basis of a questionnaire among Swiss urologists.¹ Data on the impact of scrotal pain on quality of life are lacking.

These patients are challenging to both the general practitioner and urologist, and a clear understanding of the aetiology and unpredictable course of this common condition is needed when treating them. Chronic scrotal pain refers to an ill understood complex of symptoms. Various terms have been used to describe the condition including orchalgia and orchidynia, which really refer to the testicle itself, and chronic epididymitis.

Both the European Urological Association (EAU) and the International Continence Society have adopted the generic term scrotal pain syndrome to include testicular pain syndrome, post-vasectomy pain syndrome, and epididymal pain syndrome.²⁻⁴ The condition is defined as persistent or recurrent episodic scrotal pain associated with symptoms suggestive of urinary tract infection or sexual dysfunction without confirmed epididymo-orchitis or other obvious pathology.⁴

How does chronic scrotal pain present?

Patients often describe a dull, throbbing, unilateral pain in the scrotum that may worsen throughout the day. The pain might radiate to the perineum and inner thigh and can be exacerbated by cycling or horse riding. In severe cases with hypersensitisation, the presence of overlying clothing or even bedclothes can exacerbate the problem. In a few cases, the pain becomes all consuming.

Pain with ejaculation is sometimes described, and the symptom complex can lead to reduced libido and subsequent sexual activity.

SOURCES AND SELECTION CRITERIA

We searched Medline from 1975 to 2010 using the terms “chronic scrotal pain”, “orchalgia”, “testicular pain”, and “orchidynia”. We found a mixture of retrospective and prospective studies of intermediate quality. We also used the 2009 guidelines from the European Association of Urology.

What are the causes?

Pain in the scrotum may be referred or the result of a localised pathological process, although in many cases it is idiopathic. Causes within the body of the testis, epididymis, cord, or elsewhere in the pelvis (referred pain) should all be considered.

Post-vasectomy pain syndrome

Retrospective case series, prospective observational audits, and follow-up studies suggest that chronic pain follows vasectomy in 1-15% of men.⁵⁻¹⁰ Severe scrotal pain defined as a visual analogue pain score greater than 5 was found in 1-6% of men after vasectomy in a study that followed participants for 10 years.⁶ The aetiology of this pain is unclear, but the authors of a study that compared vasectomised men with non-vasectomised men suggested that functional obstruction of the vas, spermatic granuloma formation, and chronic idiopathic epididymitis were possible causes.⁹

When obtaining informed consent for a vasectomy, this potential complication should not be underplayed, particularly in the presence of existing scrotal discomfort.

Inflammatory chronic epididymitis as a result of infection

The aetiology of chronic epididymitis is unclear but may include previous bacterial infections including prostatitis, sexually transmitted infection, and infection after surgery, trauma, or retrograde urination.

Testicular pain syndrome

Testicular causes of chronic pain syndrome are numerous (box).¹¹ A retrospective study of 34 patients with testicular pain followed up over nine years showed that up to 25% of these patients had no obvious cause for their symptoms.¹²

If there is associated radiation of the testicular pain, consider a vertebrogenic aetiology, ureteric calculi, or retroperitoneal tumours.

SUMMARY POINTS

Chronic scrotal pain is an ill understood symptom complex for which evidence based treatments are lacking

Many patients have no identifiable cause to explain their discomfort

Pain can be subclassified as testicular pain syndrome, post-vasectomy pain syndrome, and epididymal pain syndrome

As many as 16% of men undergoing vasectomy develop a chronic pain syndrome

Surgery is a last resort because its efficacy is uncertain, with limited data to support its use

Causes of chronic testicular pain¹⁰

Idiopathic
 Post-vasectomy
 Previous testicular trauma or surgery (including herniorrhaphy, hydrocele repair, and varicocelectomy)
 Tumour
 Post-infection
 Post-torsion
 Referred pain
 Diabetic neuropathy
 Imipramine withdrawal
 Polyarteritis nodosa

Postoperative chronic scrotal pain

Data on chronic postoperative pain after scrotal surgery other than vasectomy are scarce. A retrospective population based study suggested that it occurs in less than 1% of men who undergo hydrocelectomy and spermatocelectomy.¹³ The figures are thought to be similar for epididymal cyst surgery and varicocele surgery. One exception is when the pain is caused by a recurrent varicocele, which occurs in between 1-15% of patients with varicocele treated by embolisation or surgery.¹⁴

A retrospective study of men who had undergone laparoscopic nephrectomy found that 55% reported chronic scrotal pain, and a prospective study of men who underwent radical nephrectomy reported a figure of 20%. The reasons for this are not clear, although ligation of the gonadal vein is a possibility. The pain resolved spontaneously in 50% of men by one month after surgery.^{15 16}

Pelvic causes of pain

Chronic prostatitis can manifest itself as scrotal pain, although a tender prostate on digital rectal examination should direct the clinician to the source of the symptoms.

Severe pain in the scrotum, penis, perineum, and anorectal region has been described with pudendal neuralgia. Digital or ultrasound guided pudendal nerve block can be both diagnostic and therapeutic.¹⁷ Local malignancy, a lower ureteric calculus, and inguinal or groin surgery can also lead to scrotal pain.

Dysfunction of the pelvic floor muscles can lead to overactivity. This means that the muscles contract when they should relax, resulting in pain that can be referred to the scrotum. Myofascial trigger points are a hyperirritable sensitive spot, usually within a taut band of skeletal muscle in both the pelvic floor and lower abdominal muscles, and stimulation of these has been reported to reproduce pain sensations in a large number of men with chronic pelvic pain.¹⁸

Rarer causes

Treatment with amiodarone, Behçets disease, brucellosis,¹⁹ schistosomiasis,²⁰ and tuberculous epididymitis^{21 22} are rarer but well documented causes of chronic epididymal discomfort.

How is chronic scrotal pain diagnosed and investigated?

A thorough clinical evaluation during which each component of the scrotum—including the epididymis, cord, vas, and body of the testes—is palpated to feel for tenderness

and lumps is often enough to make a diagnosis if a local abnormality is detected. The patient should be examined supine and erect to demonstrate a hernia or varicocele.

A rectal examination should be performed to look for prostate abnormalities and examine the pelvic floor muscles. Culture of a midstream urine specimen may detect a urinary tract infection.

Men with symptoms compatible with prostatitis should undergo bacterial localisation studies such as the modified Meares-Stamey test.²³ Firstly a midstream urine specimen should be obtained, after which the clinician performs prostatic massage. The hands and penis are washed and a first void urine specimen is obtained. A semen culture completes the test. Cross contamination should be minimised by thorough washing before each stage of the test.

Scrotal ultrasound can be useful as a diagnostic tool and to reassure the anxious man who may be convinced he has testicular cancer. However, when the pain is localised to the epididymis, and in the absence of further positive clinical signs, ultrasonography is unlikely to be useful. No association has been shown between the common ultrasound finding of testicular calcification or microlithiasis and chronic pain.²⁴

A recent retrospective study of 90 men with chronic pelvic pain syndrome classified each patient using a clinical phenotype system (urinary, psychosocial, organ specific, infection, neurological system, and tenderness (UPOINT)).²⁴ It was evident that the total chronic prostatitis symptom index score significantly increased as the number of positive UPOINT domains increased. The number of positive domains also correlated with symptom severity. Each domain has been defined by clinical parameters and each is associated with evidence based treatments. The authors hypothesised that multimodal treatment selected on the basis of the UPOINT phenotype would have the greatest chance of success.²⁵

Management**Lifestyle modification**

In the absence of a known treatable cause, reassurance is often sufficient. Advice on avoiding activities that might exacerbate the condition, such as cycling and horse riding, might be useful. Thereafter, we suggest the following approach.

Pelvic floor physiotherapy

Prospective randomised case controlled and prospective case series suggest an overactive pelvic floor should be treated by pelvic floor re-education, including electromagnetic treatment and biofeedback. Responses that have lasted up to 12 months have been reported.²⁶⁻²⁸ Case studies have shown that applying pressure to the trigger point and stretching the muscle can improve symptoms in 72% of patients; the median follow-up in these studies was four months.^{29 30}

Drug treatment

Empirical treatment with antibiotics is often used by general practitioners and urologists for chronic epididymitis and is suggested by guidelines from the European

ADDITIONAL EDUCATIONAL RESOURCES

Resources for healthcare professionals

European Association of Urology guidelines on chronic pelvic pain (www.uroweb.org/guidelines/online-guidelines/)—These guidelines represent the latest clinical update

Leslie TA, Illing RO, Cranston DW, Guillebaud J. The incidence of chronic scrotal pain following vasectomy. *BJU Int* 2007;100:1330-3. A key reference to use when obtaining consent for vasectomy

Resources for patients

Canadian Urological Association. (www.uroinfo.ca/brochures_genital/scrotalPain.html)—Useful information about scrotal pain with a diagram of the scrotal contents

TIPS FOR NON-SPECIALISTS

- Careful clinical examination helps to localise the pain
- Empirical antibiotics have not been shown to be useful when signs of infection are absent
- Tell patients that the course of scrotal pain is not well understood and that the condition can be chronic and relapsing. It is important to stress that the syndrome may not be surgically correctable
- Refer patients who have an obvious hydrocele, varicocele, or palpable testicular or epididymal mass and those with severe pain that greatly affects their quality of life to a specialist

Association of Urology.²⁻³ No high quality randomised controlled trials support this policy, and the perceived improvement in symptoms may reflect the variable course of chronic scrotal pain.

Regular long term analgesia with paracetamol or non-steroidal anti-inflammatory drugs (or both) may control pain in some patients.^{2-3, 27} Low dose amitriptyline (25 mg taken in the early evening) may help avoid early morning drowsiness.

Referral to a pain clinic

We recommend that patients who do not respond to drug treatment be referred to a specialist pain clinic. Transcutaneous electrical nerve stimulation (TENS), spermatic cord blockade, and pelvic plexus infiltration with local anaesthesia have all been advocated to avoid surgery, which should be considered only as a last resort.¹² In the case of unilateral scrotal pain, serial genitofemoral nerve blocks using local anaesthetics can sometimes help. Psychiatric and psychological counselling as part of a multidisciplinary approach may help patients to deal with the pain.¹¹

Surgical intervention

Surgical approaches should be considered only after failure of medical management. Treatment of postsurgical chronic scrotal pain is notoriously difficult, and all conservative measures should be discussed before considering intervention.

Partial or total epididymectomy, inguinal orchidectomy, vasectomy reversal, and microsurgical spermatic cord denervation have all been described. Only retrospective data are available for all these techniques, and invariably small numbers of patients are involved. The data suggest that an inguinal orchidectomy is preferable to the scrotal approach, and that epididymectomy has a limited role in the management of intractable scrotal pain, with success rates as low as 32%.³¹ It is important to realise the small numbers involved in these case series and the variation in reported outcome.

Research agenda, uncertainty, and unanswered questions
An evidence base that allows clinicians to move away from using empirical antibiotics, which have no clear evidence of benefit, is currently lacking. The course of postsurgical chronic scrotal pain is ill understood, and patients should certainly be made aware of this when discussing surgical options. The unanswered questions surrounding this group of conditions should be explained to patients at their first consultation.

Microsurgical denervation can be offered to patients in whom medical management has been unsuccessful and after complete or partial temporary relief of chronic scrotal pain following spermatic cord block using a local anaesthetic. This procedure involves identification and isolation of the vas deferens, cremaster muscle, and testicular vessels within the spermatic cord and then clear identification of the testicular artery. This is achieved by application of vasodilating agents or micro-Doppler ultrasound, together with magnifying loops or an operating microscope. All the structures apart from the testicular artery, vas deferens, and one or two lymphatic vessels are coagulated and transected using bipolar diathermy.³²⁻³³ It is perhaps the most interesting advance to date, with one prospective European study of 35 patients reporting 96% success (complete pain-free) rates after two and a half years of follow-up.³² Several other retrospective studies have also reported 71-100% complete success rates with 16.6-31.5 months of follow-up.³³ However, before this emerges as a treatment option, higher level evidence with objective outcome measures is needed.

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ANSWERS TO ENDGAMES, p 1277. For long answers go to the Education channel on bmj.com

STATISTICAL QUESTION

Sources of bias in randomised controlled trials

Answers b, c, and d are true, whereas a is false.

ON EXAMINATION QUESTION

Vaginal discharge

Answer E is correct.

ANATOMY QUIZ

Sagittal computed tomography image through the face (bone windows)

- A Frontal sinus
- B Hard palate
- C Posterior clinoid process
- D Pituitary fossa (sella tursica)
- E Sphenoid sinus

CASE REPORT

Raynaud's phenomenon and macrocytic anaemia

- 1 This patient's symptoms would be best described as acrocyanosis. Classic Raynaud's phenomenon involves triphasic colour changes that include a red-purple phase (representing post-ischaemic hyperaemia), although this stage is not essential for a diagnosis of Raynaud's phenomenon.
- 2 The most likely diagnosis in this patient is cold agglutinin disease, in which IgM mediated agglutination of red blood cell occurs at low temperatures. This process causes intravascular occlusion within digital vessels, leading to the symptoms of acrocyanosis. IgM binding on the surface of red blood corpuscles allows complement fixation and secondary extravascular haemolysis.
- 3 Cold agglutinin disease can be idiopathic. Alternatively, infections such as *Mycoplasma pneumoniae* and Epstein Barr virus can lead to development of polyclonal cold agglutinins, causing a self limiting form of the disease. Lymphoproliferative disease can lead to persistent production of monoclonal IgM cold agglutinins, so must be excluded as an underlying diagnosis. Cold agglutinins can also feature in autoimmune diseases such as rheumatoid arthritis, systemic lupus erythematosus, and systemic sclerosis.
- 4 Haemolysis is confirmed by anaemia, increased concentration of bilirubin, and increased mean corpuscular volume (suggesting reticulocytosis). A direct Coombs test would confirm an immune aetiology to haemolysis. The degree of anaemia and macrocytosis detected by automated counters can be artificially exaggerated owing to red blood cell agglutination in vitro at test temperatures below 37°C. Serum electrophoresis and immunoglobulin levels may detect an elevated IgM concentration or identify a monoclonal band. Serology for *M pneumoniae* and Epstein Barr virus might help elucidate the cause in post-infectious cases.
- 5 Patients should be referred to haematology for further education, identification of the underlying cause, and consideration of treatment for those with persistent haemolysis. Haemolysis secondary to infection is usually self limiting.