

Chronic orchialgia: epidemiology, diagnosis and evaluation

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Abstract: Chronic orchialgia is a vexing condition defined as chronic or intermittent scrotal pain lasting at least three months that significantly interferes with daily activities. There are currently no guidelines regarding the diagnosis and management of this condition despite it being the cause of 2.5–4.8% of urologic clinic visits. Men often present with chronic orchialgia in their mid to late 30s, although the condition can present at any age. A broad differential diagnosis of chronic orchialgia includes epididymitis, testicular torsion, tumors, obstruction, varicocele, epididymal cysts, hydrocele, iatrogenic injury following vasectomy or hernia repair, and referred pain from a variety of sources including mid-ureteral stone, indirect inguinal hernia, aortic or common iliac artery aneurysms, lower back disorders, interstitial cystitis, and nerve entrapment due to perineural fibrosis; approximately 25–50% of chronic orchialgia is idiopathic in nature. In such cases, it is reasonable to consider psychological and psychosocial factors that may be contributing to chronic pain. Invasive testing is not recommended in the work-up of chronic orchialgia.

Keywords: Chronic orchialgia; testicular pain; scrotal pain

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Introduction and epidemiology of chronic orchialgia

Chronic orchialgia is one of the most vexing urologic complaints due to the relative dearth of information regarding proper evaluation and management of many of its causes. Currently, the American Urological Association (AUA) and European Urological Association (EAU) provide no formal guidelines for the diagnosis, evaluation, and management of chronic orchialgia.

Chronic pelvic pain syndromes more generally have been better characterized and studied in women than in men (1). Chronic pelvic pain affects approximately 15% of women 18–50 years old (2). In contrast, a recent study of 900 Swedish men estimated that chronic pelvic pain only affects 3–5% of men 40–69 years old (3). The differential diagnosis of chronic pelvic pain includes scrotal and testicular pain. Zermann

observed that 38.8% of cases of chronic pelvic pain in men localize to the scrotum (4). A Swedish study that surveyed how urologists treat chronic scrotal pain estimated that 2.5% of visits are for chronic scrotal pain, given that urologists on average self-reported 6.5 new patient visits with a primary diagnosis of chronic scrotal pain monthly (5). A more recent study observed chronic scrotal pain in 4.8% (113/2,375) of men who presented to an outpatient urologist (6). Yet, before management and treatment can be pursued to help men suffering from this condition, a thorough understanding of its etiologies, evaluation and management are needed. In this review, we present a contemporary understanding of the epidemiology, diagnosis, and evaluation of chronic orchialgia.

Etiologies of chronic orchialgia

Chronic orchialgia is defined as chronic or intermittent

scrotal pain lasting at least three months that significantly interferes with the patient's daily activities (7). Of note, more recent definitions state that chronic orchialgia encompasses not just pain localized to the testicle, but also pain localizing to the epididymis, paratesticular structures, and spermatic cord (8). A broad differential diagnosis for chronic orchialgia includes both chronic and unresolved acute etiologies of testicular pain including epididymitis, testicular torsion, tumors, obstruction, varicocele, epididymal cysts, hydrocele, iatrogenic injury following vasectomy or hernia repair, and referred pain from a variety of sources such as a mid-ureteral stone, indirect inguinal hernia, aortic or common iliac artery aneurysms, lower back disorders, interstitial cystitis and nerve entrapment due to perineural fibrosis (8) (Table 1). Psychological factors contributing to genital pain should also be considered as a possible etiology for chronic orchialgia (32). Schover observed that in 48 men with no defined organic etiology for their scrotal pain, many had psychological symptoms including somatization disorder (56%), non-genital chronic pain syndromes (50%), major depression (27%), and chemical dependency (27%). These men also reported low levels of social support mechanisms, with 33% feeling isolated and only 50% having a spouse (33).

Despite the numerous possible causes of chronic orchialgia, 25–50% of chronic orchialgia is currently considered idiopathic (7). It has been hypothesized that neurogenic inflammation elicited by activation of unmyelinated sensory neurons through noxious stimuli resulting in release of neuropeptides such as substance P and calcitonin gene related peptide (CGRP) are related to the pain. Specifically, this inflammation may be mediated by changes in alpha-2 receptors, given that such receptors with a lower response to alpha-2 antagonists have been identified in men with chronic scrotal pain (34). Most men with chronic orchialgia are in their mid to late 30s, although the condition can occur from adolescence to old age (7,35,36). Conditions associated with chronic orchialgia include infertility (9.7%), varicocele (8.8%), mid and distal ureteral stones (7.1%), chronic prostatitis (5.3%), lumbar pain (4.4%), stress (4.4%), epididymal cysts (4.4%), irritable bowel (4.4%), infection (3.5%), previous operation (2.7%), driving (2.7%), hernia (2.7%), and hydrocele (1.8%) according to a study of 2,375 men meeting criteria for chronic scrotal pain (6).

Diagnosis and evaluation

Diagnosis and evaluation of chronic orchialgia should be

directed towards the differential diagnosis of acute testicular pain, with chronic orchialgia considered a diagnosis of exclusion (16). The initial workup consists of a thorough history and physical exam to rule out other possible causes of testicular pain of prolonged duration (Figure 1). The physician should consider intermittent torsion, infection, masses, varicocele, other comorbidities and past surgical history in establishing a definitive cause for the patient's chronic pain.

The patient history should also elicit details of the pain including acuity of onset, severity, location, quality, timing, and radiation to other locations. Aggravating and alleviating factors should be discussed as well, with emphasis on urinary habits, bowel movements, and sexual and physical activities (8,16). For example, acuity of pain onset may help differentiate between acute pathology such as testicular torsion or infection and more chronic pathology such as testicular mass or painful varicocele. Asking about other locations where pain may be present and radiation of the pain can also be useful, given that lower back disorders, mid-ureteral stones, aortic aneurysms, and indirect inguinal hernias can all contribute to scrotal pain. In men with interstitial cystitis, location of pain is of importance as suprapubic pain is usually present. Also, relief of pain with voiding and discomfort with bladder filling would be characteristic and the history should elucidate this relationship (20).

Recent studies suggest that referred pelvic floor pain that may be due to a painful condition or pelvic floor weakness may play a role in chronic orchialgia. In 2010, 41 men with chronic testicular pain were evaluated by Planken *et al.* for pelvic floor dysfunction. The authors found 93% of the 41 men had at least 1 symptom of pelvic floor dysfunction. In subsequent pelvic floor testing using electromyography registration, 88% of patients had increased resting pelvic floor muscle tone with mean of 6.7 mV (normal <3.0 mV) (21). Men with a normal resting pelvic floor tone were significantly older than those with an increased resting tone (65.6 vs. 45.6 years, $P=0.0001$) which supported the possibility of pelvic floor dysfunction in younger men with chronic orchialgia (21). A 2016 study by Farrell *et al.* further supported these findings by showing that men with chronic scrotal pain who also had pelvic floor pain and/or tightness on digital rectal examination could have improvement in scrotal pain with physical therapy of the pelvic floor muscles. Thirty patients were followed for a median of 13 months (range, 3–48 months). Median pre-physical therapy pain score was 6/10. After a mean of 12 [interquartile range

Table 1 Differential diagnosis of scrotal pain

Etiology	Epidemiology	History	Physical exam	Labs/imaging
Acute				
Epididymitis (9)	600,000 cases in United States with bimodal distribution in men 16–30 and 51–70 years old with highest incidence	Gradual onset of unilateral pain with symptoms of urinary tract infection and history of sexual activity	Swelling of epididymis with exquisite tenderness; normal cremasteric reflex and pain relief with scrotal elevation	urinalysis and urethral culture along with Doppler U/S showing increased blood flow
Testicular torsion (10,11)	Bimodal peak in adolescence and in neonatal period	Acute onset of unilateral testicular pain	High riding testis with abnormal cremasteric reflex; pain with testis elevation	Doppler U/S showing decreased blood flow
Chronic				
Testicular mass (12)	Most common in young males average age 32 years old	Range from painless to dull ache, acute pain possible but uncommon	Mass palpated on exam	U/S to determine intra vs. extra-testicular mass
Varicocele (13)	2-10% prevalence in the general population of adult men	Dull aching, throbbing pain worsened by standing, straining, or increased activity	“Bag of worms” on palpation	Color Doppler showing spermatic vein diameter >3.0–3.5 mm in diameter with demonstration of retrograde flow with Valsalva
Spermatocele (14,15)	Increased frequency observed in sons of mothers who used DES and in patients with VHL	Usually asymptomatic	Smooth, round and usually small transilluminating mass on the epididymis	U/S can be helpful if not clear on physical exam
Hydrocele (14,15)	1–2% of neonates	Swelling of scrotal sac often bilateral, usually non painful although pain may occur with distention	Transilluminating mass	U/S helpful if testes not palpable
Post-vasectomy pain (16,17)	6% of men seek medical advice within 3–4 years post vasectomy for chronic testicular pain	Scrotal discomfort, history of vasectomy	Tender full epididymitis and tender vasectomy sites with palpable nodule	None
Post-hernia repair pain (18,19)	roughly equal amount of patients (~15%) with testicular pain at 5-year follow-up regardless of surgical approach	Burning or stabbing pain with changes in sensation, worsened by activity	Normal genital exam	None
Interstitial cystitis (20)	Self-report studies estimate 60 cases per 100,000 men; Medical billing data describe 41 cases per 100,000 men	Suprapubic pain, pain may include lower back	Variable tenderness of the abdominal wall, hip girdle, pelvic floor, bladder base, and urethra	Urinalysis, urine culture, and post void residual volume
Pelvic floor dysfunction (21-23)	4.4% of men with urinary symptoms of dysfunction and up to 6.8% with defecation symptoms	Complaints of micturition, defecation, sexual function, and pelvic floor pain	Tenderness of pelvic floor in rectal exam	urine analysis and urine culture

Table 1 (continued)

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Etiology	Epidemiology	History	Physical exam	Physical exam
Pain referred from				
Mid-ureteral stone (24,25)	Unusual presentation presented in case reports	Colicky unilateral pain	Normal genital exam	Urinalysis to assess for blood, abdominal X-ray
Indirect inguinal hernia (19,26,27)	Unusual presentation presented in case reports	Severe unilateral pain	Hernia noted on exam	Ultrasound to assess for decreased blood flow to testicle
Aortic or common iliac artery aneurysms (28,29)	Unusual presentation presented in case reports	Abdominal crampy pain radiating to testicle; may be constant or intermittent	Normal genital exam	CT or U/S to reveal aneurysm
Lower back disorders (30,31)	Unusual presentation presented in case reports	Unilateral scrotal pain worsened with coughing and leaning forward	Normal genital exam, straight leg raise aggravates pain, normal neuro exam	MRI spine

(IQR, 6–16] sessions, the median decrease in pain score was 4.5/10. Further, fewer men required analgesic medication after physical therapy (44.0% *vs.* 73.3%, $P=0.03$) (22).

Chronic orchialgia can therefore be classified as part of the spectrum of chronic pelvic pain syndromes in men, and specific questions about sexual health and abuse are important given that men with chronic pelvic pain have an increased risk [odds ratio (OR) of 1.7–3.3] of having experienced psychological, physical, and sexual abuse (37). A thorough sexual history and history of abuse may also help identify risk factors for epididymitis in addition to psychological factors that may play into chronic pain. If a psychological component to the pain is suspected the history should include assessment of psychiatric history, substance use and/or abuse, and support structures, as men with idiopathic chronic scrotal pain often have numerous psychological risk factors that may contribute to a psychological etiology (33).

A thorough physical examination of the genitalia, with emphasis on the scrotal contents including the epididymides and vasa deferentia, and a rectal exam should be performed with the goal of ruling out all potential sources of pain (8).

Laboratory examinations include urinalysis and possibly semen culture if an infectious etiology is suspected (8). A duplex Doppler scrotal ultrasound should be performed to rule out structural abnormalities (8,38). Costabile examined 48 patients with chronic orchialgia and found ultrasound to be the only diagnostic test with a significant rate of abnormal findings, with 22 normal ultrasounds and 8 of 30 patients having incidental abnormal findings, defined as an anatomical or congenital abnormality that should be

observed rather than treated. Other evaluation modalities including computed tomography (CT) scan, cystoscopy, urinalysis and culture, urodynamics, and excretory urography, which were normal in more than 91% of cases for each of these modalities (35). Compared to ultrasound, physical exam remains useful in patients with chronic pain without associated swelling. A study by Lau *et al.* examining the utility of physical exam to identify scrotal pathology in comparison with ultrasound in patients with chronic scrotal pain and without scrotal swelling yielded a sensitivity of 71.4% for physical exam in identifying pathology (39). Specificity of physical exam was 90.9%, with a positive predictive value of 76.9%, and a negative predictive value of 88.2% (39). These data show that while an ultrasound is highly useful in the setting of chronic orchialgia, its utility is rivaled by a good physical exam in patients with chronic testicular pain without obvious scrotal swelling. Therefore, idiopathic chronic orchialgia should be high on the differential diagnosis in a patient with a history that is negative for other possible causes of orchialgia and a benign physical exam.

Invasive testing and other imaging modalities including CT scan, intravenous pyelogram (IVP), retrograde pyelography, voiding cystourethrogram (VCUG) and cystoscopy are not helpful in working up chronic orchialgia and are not currently recommended as a part of the work-up (8,38). When initial work-up for chronic orchialgia results in no organic etiology a reasonable next step is spermatic cord nerve block with bupivacaine. Successful pain relief with spermatic cord blockade is helpful in both diagnosis of chronic orchialgia and in determining whether

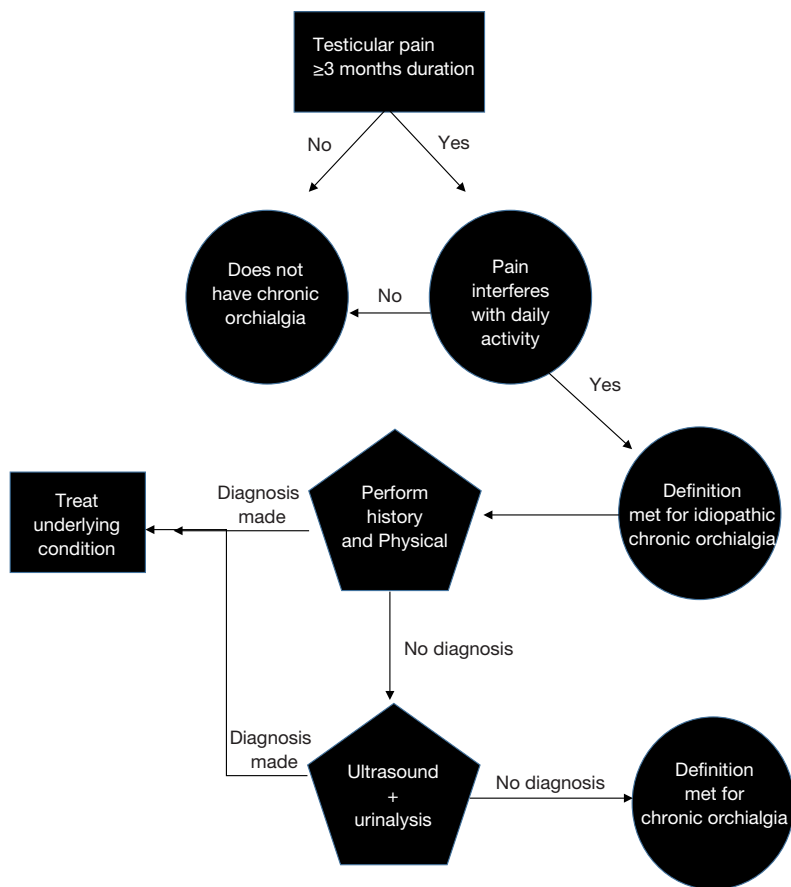


Figure 1 Diagnosis and work-up algorithm.

microsurgical spermatic cord denervation will be effective as a treatment (8,40-42).

Conclusions

Chronic orchialgia is a condition with a multitude of potential etiologies that include genitourinary and non-genitourinary conditions. Despite having a broad differential diagnosis, chronic orchialgia is classified as idiopathic in 25–50% of cases. In the absence of clear guidelines for the workup and treatment of chronic orchialgia, relying on a thorough history and physical exam to rule out all possible causes of chronic orchialgia is essential. The use of adjunct imaging modalities, in particular scrotal ultrasonography, can also facilitate a definitive diagnosis in the setting of an equivocal physical exam. Further invasive testing in the form of CT scan, IVP, retrograde pyelography, and VCUG is not recommended in the work-up of chronic orchialgia.

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Footnote

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References

1. Hakenberg OW, Wirth MP. Chronic pelvic pain in men.

- Urol Int 2002;68:138-43.
2. Mathias SD, Kuppermann M, Liberman RF, et al. Chronic pelvic pain: prevalence, health-related quality of life, and economic correlates. *Obstet Gynecol* 1996;87:321-7.
 3. Hedelin H, Johannisson H, Welin L. Prevalence of the chronic prostatitis/chronic pelvic pain syndrome among 40-69-year-old men residing in a temperate climate. *Scand J Urol* 2013;47:390-2.
 4. Zermann DH, Ishigooka M, Doggweiler R, et al. Neurourological insights into the etiology of genitourinary pain in men. *J Urol* 1999;161:903-8.
 5. Strebel RT, Leippold T, Luginbuehl T, et al. Chronic scrotal pain syndrome: management among urologists in Switzerland. *Eur Urol* 2005;47:812-6.
 6. Ciftci H, Savas M, Yeni E, et al. Chronic orchialgia and associated diseases. *Curr Urol* 2010;4:67-70.
 7. Davis BE, Noble MJ, Weigel JW, et al. Analysis and management of chronic testicular pain. *J Urol* 1990;143:936-9.
 8. Levine L. Chronic orchialgia: evaluation and discussion of treatment options. *Ther Adv Urol* 2010;2:209-14.
 9. Trojian TH, Lishnak TS, Heiman D. Epididymitis and orchitis: an overview. *Am Fam Physician* 2009;79:583-7.
 10. Pentylala S, Lee J, Yalamanchili P, et al. Testicular torsion: a review. *J Low Genit Tract Dis* 2001;5:38-47.
 11. Ta A, D'Arcy FT, Hoag N, et al. Testicular torsion and the acute scrotum: current emergency management. *Eur J Emerg Med* 2016;23:160-5.
 12. Junnila J, Lassen P. Testicular masses. *Am Fam Physician* 1998;57:685-92.
 13. Shridharani A, Lockwood G, Sandlow J. Varicocelelectomy in the treatment of testicular pain: a review. *Curr Opin Urol* 2012;22:499-506.
 14. Hagerty JA, Yerkes EB. Pediatric scrotal masses. *Clin Pediatr Emerg Med* 2009;10:50-5.
 15. Eyre RC, O'Leary MP, Eamranond P. Evaluation of nonacute scrotal pathology in adult men. Available online: <http://www.uptodate.com/contents/evaluation-of-nonacute-scrotal-pathology-in-adult-men?selectedTitle=1>
 16. Gordhan CG, Sadeghi-Nejad H. Scrotal pain: evaluation and management. *Korean J Urol* 2015;56:3-11.
 17. Morris C, Mishra K, Kirkman RJ. A study to assess the prevalence of chronic testicular pain in post-vasectomy men compared to non-vasectomised men. *J Fam Plann Reprod Health Care* 2002;28:142-4.
 18. Grant AM, Scott N, O'Dwyer P. Five-year follow-up of a randomized trial to assess pain and numbness after laparoscopic or open repair of groin hernia. *British journal of surgery* 2004;91:1570-4.
 19. Brooks DC, Obeid A, Hawn M. Classification, clinical features and diagnosis of inguinal and femoral hernias in adults. Available online: <https://www.uptodate.com/contents/classification-clinical-features-and-diagnosis-of-inguinal-and-femoral-hernias-in-adults>
 20. Clemens JQ. Pathogenesis, clinical features, and diagnosis of interstitial cystitis/bladder pain syndrome. Available online: <http://www.uptodate.com/contents/pathogenesis-clinical-features-and-diagnosis-of-interstitial-cystitis-bladder-pain-syndrome>
 21. Planken E, Voorham-van der Zalm PJ, Lycklama ANAA, et al. Chronic testicular pain as a symptom of pelvic floor dysfunction. *J Urol* 2010;183:177-81.
 22. Farrell MR, Dugan SA, Levine LA. Physical therapy for chronic scrotal content pain with associated pelvic floor pain on digital rectal exam. *Can J Urol* 2016;23:8546-50.
 23. MacLennan AH, Taylor AW, Wilson DH, et al. The prevalence of pelvic floor disorders and their relationship to gender, age, parity and mode of delivery. *BJOG: An International Journal of Obstetrics & Gynaecology* 2000;107:1460-70.
 24. Holland JM, Feldman JL, Gilbert HC. Phantom orchialgia. *J Urol* 1994;152:2291-3.
 25. Goldberg SD, Witchell SJ. Right testicular pain: unusual presentation of obstruction of the ureteropelvic junction. *Can J Surg* 1988;31:246-7.
 26. Yeates WK. Pain in the scrotum. *Br J Hosp Med* 1985;33:101-4.
 27. Desai Y, Tollefson B, Mills L, et al. Testicle ischemia resulting from an inguinal hernia. *J Emerg Med* 2012;43:e299-301.
 28. Ali MS. Testicular pain in a patient with aneurysm of the common iliac artery. *Br J Urol* 1983;55:447-8.
 29. McGee SR. Referred scrotal pain: case reports and review. *J Gen Intern Med* 1993;8:694-701.
 30. White SH, Leslie IJ. Pain in scrotum due to intervertebral disc protrusion. *Lancet* 1986;1:504.
 31. Wouda EJ, Leenstra S, Vanneste JA. Scrotal pain as the presenting symptom of lumbar disc herniation: a report of 2 cases. *Spine (Phila Pa 1976)* 2005;30:E47-9.
 32. Hong MK, Corcoran NM, Adams SJ. Understanding chronic testicular pain: a psychiatric perspective. *ANZ J Surg* 2009;79:676-7.
 33. Schover LR. Psychological factors in men with genital pain. *Cleve Clin J Med* 1990;57:697-700.
 34. Singh V, Sinha RJ. Idiopathic chronic orchialgia - a frustrating issue for the clinician and the patient. *Indian J*

- Surg 2008;70:107-10.
35. Costabile RA, Hahn M, McLeod DG. Chronic orchialgia in the pain prone patient: the clinical perspective. *J Urol* 1991;146:1571-4.
 36. Wesselmann U, Burnett AL, Heinberg LJ. The urogenital and rectal pain syndromes. *Pain* 1997;73:269-94.
 37. Hu JC, Link CL, McNaughton-Collins M, et al. The association of abuse and symptoms suggestive of chronic prostatitis/chronic pelvic pain syndrome: results from the Boston Area Community Health survey. *J Gen Intern Med* 2007;22:1532-7.
 38. Granitsiotis P, Kirk D. Chronic testicular pain: an overview. *Eur Urol* 2004;45:430-6.
 39. Lau MW, Taylor PM, Payne SR. The indications for scrotal ultrasound. *Br J Radiol* 1999;72:833-7.
 40. Benson JS, Abern MR, Larsen S, et al. Does a positive response to spermatic cord block predict response to microdenervation of the spermatic cord for chronic scrotal content pain? *J Sex Med* 2013;10:876-82.
 41. Levine LA, Matkov TG, Lubenow TR. Microsurgical denervation of the spermatic cord: a surgical alternative in the treatment of chronic orchialgia. *J Urol* 1996;155:1005-7.
 42. Heidenreich A, Olbert P, Engelmann UH. Management of chronic testalgia by microsurgical testicular denervation. *Eur Urol* 2002;41:392-7.

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