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...
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%), lumber 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
| 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 neonatale 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 |
| Spermatocoele (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 is 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)
(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
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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