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INVITED COMMENTARY

Chronic Scrotal Content Pain: A Diagnostic and Treatment Dilemma

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The chronic scrotal content pain (CSCP) patient remains a challenge for the urologist and men's health specialist. This commentary is intended to provide a framework for properly evaluating and treating this challenging patient. Although several evaluation and treatment algorithms have been published, they have yet to be incorporated into formal guidelines.[1,2] Pain in the genitalia frequently involves multiple structures. As a result, we refer to pain in this area as CSCP, since it may be perceived to be coming from the testicle, epididymis, vas deferens, and/or spermatic cord. It is not a minor problem, as approximately 2.5% of all urology visits are associated with CSCP resulting in a significant health care financial burden.[3,4] These patients are typically frustrated. They have seen multiple doctors, failed multiple treatment options, and they can be met with considerable suspicion by the treating physician that they are malingerers simply seeking pain medicine or disability benefits. As a result, these patient encounters are riddled with potential problems that the physician must be able to navigate. Many physicians struggle with what to offer or in what order to offer it. Moreover, we are not able to cure them all. Nevertheless, we can provide a reasonable evaluation and treatment approach that is likely to help or even potentially eradicate the pain for the majority of patients. The most common etiology for CSCP is idiopathic, occurring in up to 50% of patients.[1] The easily recognized and treatable causes include varicocele, epididymitis, spermatocele, tumor, infection, and torsion. Other etiologies include pelvic floor dysfunction and referred pain from the kidney, ureter, spine, hip, and other pelvic structures. The pain may also be part of the chronic prostatitis/chronic pelvic pain syndrome, where up to 50% of men also have pain in the testes.[1] Iatrogenic CSCP most frequently follows vasectomy and inguinal hernia repair.

The history obtained must elucidate the onset, severity (0—10 scale), and nature (eg, burning, stabbing, aching) of the pain as well as radiation or activities that may exacerbate or ameliorate the pain. Many men report that their pain is triggered by voiding, defecation, prolonged sitting, and physical or sexual activity. Evaluation should include a detailed physical exam with sequential palpation of the entire testicle, epididymis, vas deferens, cord, and inguinal canal. If the pain is bilateral, the less painful side should be examined first. A 360-degree digital rectal exam must be performed. We have learned that many of the men who were previously diagnosed with idiopathic pain have pelvic floor dysfunction.[5] Typically, imaging studies have little value, but if there is any question of structural abnormalities within the scrotum, duplex ultrasound should be performed.[6] Urinalysis is critical to rule out infection and/or identify micro-hematuria from a stone or tumor within the urinary tract, causing referred pain to the scrotal contents.

The most valuable diagnostic tool to determine the pathway for the pain signal is a spermatic cord block (SCB).[7] This is typically performed in the clinic by isolating the spermatic cord at the pubic tubercle level and injecting 20 mL of 0.25% bupivacaine without epinephrine. Temporary but complete relief indicates the pain signal is passing through the spermatic cord nerve fibers. The duration of pain relief following the block appears to be useful information as it may indicate the degree of sensitization within the central or peripheral nervous system. Those men who have longer duration of pain relief following a block (greater than 4 hours) are most likely to benefit from surgical treatments such as micro-denervation of the spermatic cord (MDSC) than patients who experience partial or less than 1 hour of complete relief.[8] At this time, SCB appears to be the most useful screening tool. While performing placebo injections could theoretically rule out malingerers, this has yet to be evaluated scientifically. Moreover, in our personal experience, very few of these patients are true malingerers.[9]

Chronic pain is less well understood than acute pain. Pain becomes chronic by definition when it is present consistently or intermittently for 3 months or more.[3] The most common nerves thought to be serving the scrotal contents (ilioinguinal, iliohypogastric and genital branch of the genitofemoral), in fact, have little to do with CSCP. These nerves provide sensation to the skin over the pubis, inguinal area, and anterior scrotum. Sensory perception and pain of the scrotal contents are primarily carried via the autonomic superior, middle, and inferior spermatic nerves.[3] Nocireceptors in the tissues are activated by noxious stimuli. The pain signal travels in myelinated A-delta or unmyelinated C-fibers within and on the spermatic cord.[3] Elegant work has demonstrated that 50% of these sensory and autonomic nerves are found around the vas deferens, 20% in the cremasteric fascia, and the rest are scattered throughout the spermatic cord.[10]

Treatment remains a therapeutic dilemma as there is no reliable therapy that is all inclusive. A stepwise approach makes the best sense. One should start with a trial of medication. If there is evidence of infection based upon urinalysis, a culture should be attained and treated accordingly. It should be noted that

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infection is rarely a cause of chronic pain. If an infection is identified, doxycycline and quinolones are preferred as they provide the best tissue concentration in the scrotal structures. But if previous courses of antibiotics have failed, repeated courses are of no value. Nonsteroidal anti-inflammatories can also be useful to reduce not only the inflammation that may be responsible for the pain but also directly affect pain fibers.[11] This tends to be most valuable for acute or early chronic pain. Neuropathic medications including antidepressants and anti-convulsants are the next line of treatment. The antidepressants such as amitriptyline or nortriptyline work by inhibition of norepinephrine at first- and second-order neurons in the central nervous system. The anti convulsants such as gabapentin or pregabalin work by reducing neuron excitation and increasing inhibition of those neurons by blocking calcium channels. We have had most success with amitriptyline 10−20 mg at bed time as it has a soporific effect but rarely causes daytime side effects. Anti convulsants at higher doses, on the other hand, may reduce pain but seem to throw people into a "fog." It has been shown that these agents do not tend to work in patients with post-vasectomy pain syndrome.[12] If the patient is less than 1 year from the onset of pain and does respond to a SCB, one can consider a series of blocks. We use 9 mL of 0.5% bupivacaine without epinephrine mixed with 10 mg (1 mL) of triamcinolone. These injections are performed every 2 weeks for a series of 4−5 injections with the hopes of temporarily knocking out the pain and thereby reducing the stimulation of the central nervous system. There should be gradual reduction of the level of pain with each block. If the pain quickly returns to baseline following each block, it is unlikely that this will create a lasting effect. Pelvic floor physical therapy for pelvic floor myalgia has been noted to be successful. Farrell et al[5] demonstrated in 30 men with CSCP and a positive digital rectal examination (indicating pelvic floor spasm/pain), that pelvic floor physical therapy resulted in improvement of pain in 50% of the patients, with 42% having no to minimal residual pain, and 30% of narcotic users were able to get off these agents. It should be recognized that chronic pain can cause significant emotional distress and that psychological or psychiatric counseling may help the patient cope better with the pain.

When nonsurgical treatments fail, surgery is the next option. All patients who consider surgery should undergo an informed consent, counseling the patients that the pain could be persistent. There is also risk of bleeding, hydrocele formation, vascular injury to the testicle causing testicular atrophy, and hypogonadism. Historically, one of the most commonly prescribed procedures for scrotal content pain is epididymectomy.[4] This procedure is indicated when the pain involves the epididymis only, especially after a vasectomy and/or when there is a painful cyst or mass in the epididymis and/or ultrasound structural abnormalities are identified.[13−16] In this circumstance, 50−87% of men have been reported to have durable relief following an epididymectomy. But this procedure has not been found to be successful in those with chronic inflammation.[15] In the men who have failed epididymectomy, this suggests that the pain was already involving other structures outside of the epididymis, such as the testicle or cord.[17]

MDSC was first reported in a case report in 1978 by Devine and Schellhammer.[18] This procedure has evolved over the years to be the primary surgical approach when multiple structures within the scrotum are involved with pain. This outpatient surgical procedure is performed under the microscope and typically takes 1−1.5 hours to perform with minimal blood loss. The primary advantage of this procedure is being able to spare the testicle, which has clear psychological and physiological benefits. The goal of the procedure is to divide all structures within the cord, sparing all identified arteries as well as several lymphatics, to reduce the likelihood of hydrocele formation. The peri-vasal fascia, which is rich in nerves, must be stripped and divided. The vas is divided again if a vasectomy had been previously performed but otherwise is left intact.[19] The key selection measure for the MDSC appears to be a positive response to a SCB.[7] Pooled success rates have suggested 83% of patients are pain free after the procedure with 12% reporting some improvement, and up to 5−10% having no improvement.[20] A 2016 American Urological Association presentation indicated that men who reported bilateral scrotal content pain, pain with ejaculation and bilateral pain, bilateral pain on physical examination, and had less than 12 hours relief following a SCB were unlikely to benefit from MDSC.[8] This was thought to be due to central nervous system sensitization and/or a pelvic floor disorder.[8]

An alternative approach is using the robot to perform MDSC, which has been reported by Calixte and associates.[21] Published results are less robust compared to the success rates reported with the open microscopic approach.[2,22−25] The question remains, is use of the robot necessary to perform this operation? It would likely be costlier to perform in most centers and unless the success rates were substantially better, this may be more technology than needed. Finally, this targeted approach does not dissect out the central spermatic cord tissue where 30% of nerves reside.

Outcomes following MDSC for 27 men with postvasectomy pain syndrome who had failed medical therapy demonstrated that 81% of those patients who had pain in multiple sites had complete and durable relief.[26] Vasectomy reversal has also been recommended for post-vasectomy pain syndrome, mostly in small single-center studies with reported pain-free rates of up to 69%.[27−29] The advantage of this procedure is clearly that it spares the testicle, but it does reverse the purpose of vasectomy, can be quite costly if not covered by insurance, and not all urologists are comfortable with performing this procedure. Finally, orchiectomy may be considered when all treatments have failed and the patient remains symptomatic. Selection for orchiectomy should be based upon a successful cord block.[7] If they have persistent pain following the cord block, the likelihood of success is low. An inguinal approach, as in a radical orchiectomy, appears to have a higher success rate than a scrotal approach.[3] Failure rates as high as 80% have been reported with orchiectomy for CSCP.[30]