

Idiopathic chronic orchialgia – a frustrating issue for the clinician and the patient

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Abstract Chronic testicular pain represents a management dilemma to clinicians and remains a very frustrating clinical problem. In nearly 25% of patients there is no obvious cause for idiopathic chronic orchialgia. Chronic testicular pain may occur at any age but the majority of patients are in 20–30 years of age group. The desired goal of the treatment is to allow the patient return to routine activity without significant use of analgesics. There is very little published material, in urology, about the etiology and treatment of idiopathic chronic orchialgia but situation is not bleak since many treatment options do exist which can allow the patient enjoy life with mechanisms for coping with pain. A multidisciplinary team approach is required, so that the patient can benefit from the different treatment options available at present.

Keywords Orchitis · Testis · Chronic Pain

Introduction

Chronic orchialgia is defined as intermittent or constant unilateral or bilateral testicular pain of more than 3 months which significantly interferes with the daily activities of the patient, prompting him to seek medical intervention [1]. Nearly 25% of patients with chronic orchialgia have no obvious cause for the pain called *idiopathic chronic orchialgia* [1–5]. Chronic testicular pain represents a management dilemma to all urologists and it remains a frustrating clinical problem. There is little published material in urology literature about the etiology and treatment of idiopathic chronic orchialgia. The desired goal of treatment is to allow the sufferer to return to routine activity without significant use of analgesics. Chronic testicular pain occurs at any age but the majority of the patients are in the 20–30 years of age group. The pain can be unilateral or bilateral, constant or intermittent, spontaneous or exacerbated by physical activities and pressure. On clinical examination, the testis may be mild to moderately tender but in the majority of patients it is otherwise unremarkable [3–5].

Neural pathway for testicular pain

The testis shares its innervation with the caput and corpus portion of epididymis. Testis receives its main innervation from the superior spermatic plexus via nerve fibres accompanying the internal spermatic vessels with contributions from inferior spermatic plexus, superior hypogastric plexus and other sympathetic chain ganglia. The parietal and visceral layers of tunica vaginalis and cremaster muscle receive afferent innervation originating at L₁–L₂, carried by the genital branch of genito-femoral nerve [2].

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Pain may be referred to somatic structures in the same segmental nerve supply as the affected site. It is likely that ureteric autonomic afferent nerves from the same somatic segments (L₁, L₂) cross over to the testis afferent nerves in the autonomic ganglia referring the perception of pain to the testis.

Basic sciences have been explored for the possible etiology of idiopathic chronic orchialgia. Based on the empirical treatment of chronic testicular pain by anticonvulsant drugs; neurogenic inflammation has been implicated in the pathophysiology of idiopathic chronic orchialgia. The neurogenic inflammation is 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). A highly selective substance p receptor antagonist was effective against the inflammatory process. High levels of IL-6 and TNF- α have clearly been demonstrated in patients with complex regional pain syndromes providing evidence that depression and chronic pain share common biological pathways in the serotonergic and nor-adrenergic systems.

Alpha-2 (α -2) adrenergic receptors play a key role in regulating neurotransmitter release in the central and peripheral sympathetic nervous systems. It is hypothesized that changes in the properties of α -2 presynaptic receptors may be involved in chronic testicular pain. Human vas deferens obtained from patients with chronic testicular pain showed reduced sensitivity to *rauwolscine*, a selective α -2 antagonist. Similarly reduced *rauwolscine* sensitivity was observed in the isolated vas of a mutant mouse strain (D79N) which harbours a malfunctioning α -2a adrenoceptor. These results suggest that vas deferens of subjects who present with intractable chronic testicular pain exhibit a reduction in the pre-junctional autoinhibition mechanism [5–8].

It has been reported that a significant number of patients who suffer from chronic orchialgia express signs of major depression and a significant number of these patients have clinical dependency [9]. About 1% of patients showed co-existence of psychosexual problems and depression after they underwent vasectomy for contraception. Although it is recognized that psychological symptoms may co-occur with testicular pain but investigation is lacking which could shed light on the relative importance of psychological parameters in the development and maintenance of chronic testicular pain [9]. Long term effects of sterilization on psychological symptoms have shown that depressive symptoms and anxiety occur in significant number of cases [10].

Treatment options for idiopathic chronic orchialgia

I. Non-surgical management

1. Scrotal support
2. Hot fomentations

3. Antibiotics
4. Nonsteroidal anti-inflammatory drugs (NSAID)
5. Alpha- adrenergic antagonists
6. Tricyclic antidepressants (TCAD), gabapentin, carbamazepine
7. Allopurinol
8. Transcutaneous electrical nerve stimulation (TENS)
9. Pulsed radiofrequency

II. Minimally invasive treatment options

1. Spermatic cord blockade by local anaesthetics and methylprednisolone
2. Pelvic plexus blockade under trans rectal ultrasound (TRUS) guidance
3. Laparoscopic denervation of spermatic cord

III. Open surgical intervention

1. Microsurgical denervation of the spermatic cord
2. Microsurgical testicular denervation
3. Orchiectomy

Non-surgical management

Scrotal support Use of scrotal suspension along with modification of predisposing exertional and postural habits has been recommended. The persons involved in jobs requiring prolonged standing and driving need job modification to avoid predisposing factors. Scrotal support is highly effective in cases of a scrotal or inguino-scrotal swelling associated with chronic testicular pain.

Hot fomentation Recommended in the form of sitz bath, it gives a soothing effect and alleviates pain. It is also helpful in conditions of associated tension myelgia of pelvic floor and chronic pelvic pain syndromes.

Antibiotics and analgesics Nonsteroidal anti-inflammatory drugs and oral antibiotics for one month duration may be useful in relieving pain. Antibiotics either from the tetracycline group to cover a possible chlamydial or ureaplasma infection and/or quinolones are preferred. Antibiotics are administered on the presumption that the pain may be secondary to some unidentified infection. Non-steroidal anti-inflammatory drugs are prescribed along with the antibiotics; they reduce the local inflammatory process and thereby relieve the pain [8].

Alpha-adrenergic antagonists A trial of α -1 blocker should be given to patients who do not respond to conservative management and wish to avoid the surgical options. Pharmacological experiments with human vas deferens segments showed a predominance of the α -1 adrenoceptors of α -1a type. In *in-vitro* experiments, the use of selective α -1a antagonist resulted in reduction of the response of human scrotal vas deferens to electrical field stimulation by 42%. This suggested that the use of selective α -1a antagonist

in vivo might relieve a possible obstruction/spasm of vas deferens [11].

Tricyclic antidepressants, gabapentine and carbamazepine The clinical relationship between depression and chronic pain is not clear. Many patients improve after a trial of low-dose antidepressants [12]. A dose titration should be done to get the desired clinical response. Doxepin and amitriptyline appear to have an edge over other tricyclic antidepressants. Oral gabapentin should be tried in refractory chronic orchialgia; it has a definite therapeutic effect on chronic genito-urinary pain even though the exact mechanism of action is not clear [13].

Allopurinol It has been observed that in hyperuricemia the intracanalicular deposits of uric acid crystals lead to chronic testicular pain. A trial of allopurinol is suggested in this particular subset of patients [14,15].

Transcutaneous electrical nerve stimulation (TENS) If the patient does not respond to the above mentioned measures then a trial of TENS may be taken. Multidisciplinary care and pain clinic management are crucial in these patients [12]. TENS (Transcutaneous electrical nerve stimulation) has been successful in many patients with chronic orchialgia [12,14]. TENS works on the principle that transcutaneous electrical stimulation causes release of endorphins at the dorsal horn of the spinal cord. Endorphins along with enkephalin are the main neurotransmitter responsible for closing the gate between a peripheral nerve and the spinal cord leading to reduction in pain. A trial of TENS for 1-3 months is safe and may be of some benefit.

Pulsed radiofrequency Cohen reported on 3 patients with groin pain and chronic orchialgia who were successfully treated using pulsed radiofrequency of the nerves innervating the area and recommended further randomized, placebo controlled studies to assess its efficacy [16].

Minimally invasive treatment options

Spermatic cord block by local anaesthetics and methylprednisolone Spermatic cord block can be tried using a mixture of 6 ml of 1% lignocaine (without adrenaline) with 1ml of methylprednisolone (40 mg/ml). The procedure if successful can be repeated at regular intervals. Patients who have long term relief of pain from subcutaneous block can be managed expectantly, while those with only temporary relief of pain may be considered for repeated cord blocks [12].

Pelvic plexus block under TRUS guidance Zorn et al reported their experience with a transrectal ultrasound (TRUS) guided pelvic plexus local anesthesia block in men with chronic orchialgia [15]. Of their 8 patients, 6 had complete though temporary relief of pain. They found that periprostatic nerve blockade using local anaesthetic and steroid in the region of the pelvic plexus which lies anterior to the rectum at the prostatovesical junction was effective for chronic orchialgia [15]. They showed that pelvic plexus

sometimes provides the predominant sympathetic and parasympathetic efferent input to the testis rather than the spermatic plexus. The location of these nerves may explain the association of testicular pain with prostatic inflammation or after prostatic surgery [15].

Laparoscopic denervation of spermatic cord Cadeddu et al evaluated the efficacy of laparoscopic testicular denervation as a testis-sparing, minimally invasive procedure [17]. Through three ports, the gonadal vessels were isolated circumferentially and divided cephalad to the vas deferens and its vasculature. Preliminary evaluation of laparoscopic testicular denervation indicates that this technique may offer most patients (seven of nine) with refractory chronic orchialgia a significant reduction in pain (71% reduction in pain score) with minimal morbidity. However, this study is limited by its retrospective, unrandomized design with small number of patients.

Open surgical intervention

Microsurgical denervation of the spermatic cord Levine et al evaluated the results of microsurgical denervation of the spermatic cord in 27 patients with normal physical examination and scrotal ultrasound evaluation who had a temporary relief of pain after undergoing outpatient cord block [18]. The results (irrespective of the etiology) showed complete pain relief in 76% and partial relief of pain in 9.1%. This technique involved division of the ilioinguinal nerve and its branches. The proximal end of the ilioinguinal nerve was buried under the external oblique fascia to reduce the likelihood of neuroma formation, then using an operating microscope all fascia and cremaster fibres were divided (even in cases of previous vasectomy) to eradicate sympathetic innervation which might contribute to a reflex sympathetic dystrophy. This procedure can be challenging, especially in the presence of previous regional surgery.

Microsurgical testicular denervation Chooa and Swami described the microscopic testicular denervation of the cases with idiopathic chronic orchialgia [19]. The fascia is excised from the cord and the adventitia stripped from the vas deferens, arteries and veins for approximately 2 cm. This procedure divides the terminal branches of genitofemoral nerve. Although patient number was limited, the authors reported that all 4 patients with chronic orchialgia had complete and lasting pain relief.

Orchiectomy If the medical or more invasive measures fail to control the pain, inguinal orchiectomy is recommended for these unfortunate patients [1, 5, 8, 20]. Davis et al in an interesting study compared the results of inguinal versus scrotal orchiectomy for intractable testicular pain and reported 73% complete pain relief following inguinal orchiectomy versus 55% pain relief following scrotal procedure [1]. The better results given by inguinal orchidectomy may reflect inadvertent release of ilioinguinal or genitofemoral

nerve entrapment in the inguinal area. They showed that 90% of those treated with epididymectomy required subsequent orchiectomy for relief of pain. Consequently, they recommended proceeding directly to orchiectomy if surgical treatment is considered. Since orchiectomy is permanent and has an unpredictable response, many do not agree and suggest that it should be avoided [8].

Conclusions

Idiopathic chronic orchialgia remains a difficult condition to manage since the cause of pain is not known. It is vital to realize that the goal of treatment should not be complete elimination of pain; rather it should allow the patient to return to an active life with a better mechanism for coping with pain. Further research regarding all aspects of chronic orchialgia is needed. A multidisciplinary team approach is ideal, so that the patient may benefit from different treatment options available at present.

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