INVITED COMMENTARY

Symptomatic male with subclinical varicocele found on ultrasound evaluation

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Scrotal pain is a commonly encountered complaint in urology practice. It occurs in around 2%–10% of patients with varicocele.1 Despite a relatively common association, the effect of varicocele on pain is much less investigated than its relation with infertility. Biggers and Soderdahl were the first to explore surgical treatment for pain attributed to a clinical varicocele in 1981, reporting an improvement rate of 48% after surgery.2 This rate turned out to be somehow lower than what was reported in later studies,3 representing a favorable response to surgery in such cases.

The management of subclinical varicocele represents an area of historical controversy. To begin with, no universal consensus exists on the definition of this entity. Venous reflux in the internal spermatic vein without palpable distention of the pampiniform plexus as described by Comhaire and Kunnen is probably the most acceptable definition,4 although this is more widely described as an incidental scrotal ultrasound finding. Studies on subclinical varicocele are scarce and mainly investigate the value of its management in infertile men. In this commentary, we aim to look for the best practice when managing a symptomatic male with subclinical varicocele.

PATHOPHYSIOLOGY OF PAIN IN VARICOCELE

Varicocele is thought to result from incompetent or absent valves within the veins of the testis, thereby resulting in retrograde flow of blood. Its predilection on the left side triggered an assumption that anatomical differences may also be contributing to its etiology. Regardless of what mechanism exists, the ultimate outcome is a rise in venous hydrostatic pressure, which is believed to be responsible for the deleterious effects of varicocele on male fertility as well as the causative factor for pain development. When hydrostatic pressure is elevated, it will cause venous distention and subsequent compression of the adjacent nerves running along the spermatic cord. In an attempt to find a potential anatomical basis for denervation procedures, Parekattil et al. were able to demonstrate Wallerian degeneration in the nerves running along the spermatic cord. These nerves were located along the cremasteric muscle fibers, perivasal tissues, and peri-vessel tissues.5 Another consequence for elevated hydrostatic pressure is the development of intra-testicular stasis and hypoxic injury that may be expressed as pain. Despite their hypothetical plausibility, such theories still require validation with well-designed clinical studies.

CLINICAL PRESENTATION AND DIAGNOSIS

Scrotal pain can be secondary to numerous etiologies, which necessitates a thorough understanding of the different presentations that patients may have. Varicocele pain is usually chronic, dull, aching, and throbbing in character occurring after a period of physical activity or prolonged standing. It is localized to the testis and is relieved by rest or lying supine. Physical examination should be performed in a warm room to ensure cremasteric relaxation in the standing and supine positions. On palpation, a varicocele is a compressible mass occurring above and around the testis resembling the so called “bag of worms” feature. Dubin and Amelar6 developed a grading scheme, which divides clinical varicocele into three grades. Grade 1 is when a varicocele is only palpable with Valsalva maneuver, grade 2 is when it is palpable without Valsalva maneuver, and grade 3 is a grossly visible varicocele without palpation.

Radiologic imaging for evaluation of varicocele is feasible but not obligatory. Duplex ultrasonography is most commonly utilized to evaluate venous dilatation. Although appropriate criteria for subclinical varicocele diagnosis are controversial, a spermatic vein diameter >3.0 mm with demonstration of retrograde flow during Valsalva is generally consistent with clinical varicocele.7 Internal spermatic veins are found to become palpable at diameters of 3.0–3.5 mm while reversal of flow is manually felt in veins >3.5 mm in diameter.8

In addition to ultrasonography, other radiographic investigations such as spermatic venography, radionucleotide scanning, and thermography are available. The invasiveness and/or high cost of these investigations have rendered them less attractive and not commonly utilized in the diagnosis of varicocele.

DIFFERENTIAL DIAGNOSIS

Before attributing orchialgia to varicocele, other potentially more serious etiologies should be ruled out. Testicular torsion or tumor, epididymitis, inguinal hernia, hydrocele, and spermatocele are alternative conditions that need to be addressed during patient evaluation. The search for lower urinary tract symptoms, distal ureteral stone, and irritable bowel syndrome is warranted as testicular pain may also be referred from other somatic or visceral source.

The dilemma occurs when a subclinical varicocele is the only pathology. In nearly 25% of patients, there is no obvious cause for chronic orchialgia and hence it is considered idiopathic.9

TREATMENT OPTIONS

Conservative/nonsurgical options

Conservative measures are usually the first recommendation for men with chronic scrotal pain as well as clinical varicocele-related pain. They consist of scrotal support, nonsteroidal anti-inflammatory medications, and physical activity limitations. A success rate of 0.04% was noted when conservative measures only were used in a military population with varicocele.3 In another study, 140 patients were treated conservatively for up to 8 weeks with only five patients (3.5%) showing partial improvement and recurrence afterward.10 These results obviously disfavor conservative measures, but since a noninvasive approach is always preferred, there is no harm in adapting such an approach initially. That being said, the overwhelming majority of men with varicocele-related pain who undergo conservative treatment will eventually require surgery.

Varicocelectomy

Surgical treatment of varicocele has been recommended only in clinically palpable disease (grades 1, 2, or 3).11 Therefore, all studies assessing the value of varicocelectomy for painful varicoceles have...
eliminated subclinical disease. On the other hand, most trials assessing the efficacy of surgery have been retrospective in design and included small number of cases. Also, studies comparing the efficacy of different techniques of varicocelectomy for pain resolution remain nonexistent.

A follow-up of 82 patients for at least 3 months after microsurgical varicocelectomy showed complete resolution of pain in 88% and no response in 11% of patients. Among nonresponders, grade 3 varicocele was present in 6.1%, grade 2 in 3.6%, and grade 1 in 1.2%, suggesting that the grade of a painful varicocele might influence the outcome of repair. In another study by Kim et al., a longer duration of follow-up was implemented (1 year) where 91.2% of the patients had complete or marked resolution in their pain.12

Despite an obvious benefit in patients with clinically palpable varicocele, the lack of reports evaluating the effect of surgery on patients with subclinical varicocele that is not included in the list of surgery indications of all major guidelines leaves this approach unattractive.

**Spermatic cord denervation**

Microsurgical denervation of the spermatic cord was introduced in 1978 with a case report of two patients.13 Over the last two decades, articles have been published supporting this technique, its efficacy, and its safety in the management of chronic orchialgia.13,14 The concept of this procedure has been described by some urologists as an “extended varicocelectomy” which aims to transect all spermatic cord structures that carry neural elements, preserving arterial inflow to the testicle and several lymphatics to prevent postoperative testicular atrophy and hydrocele formation. The aim is to interrupt neural pathways to and from the scrotal contents inhibitingafferent nerve stimulation and downregulating pain centers. This procedure is usually implemented in the context of idiopathic chronic orchialgia and is not recommended for treatment of a subclinical varicocele. Another factor in favor of implementing this procedure is the fact that its effect can be foreseen before surgery through the use of a simple cord block. A positive spermatic cord block significantly correlates with microsurgical denervation success rate afterward.15

Cure rates after spermatic cord denervation range from 70% to 97%14,15. In a recent study by Marconi et al., subinguinal microsurgical spermatic cord denervation was performed on 52 testicular units belonging to 50 patients.14 Patients were followed 6 months after surgery. Pain completely resolved in 40 patients (80%) while intermittent testicular discomfort persisted in 6 (12%) and no change in pain severity in 4 (8%) patients. Denervation of the spermatic cord is also considered a salvage procedure that can be offered after failed prior surgery. Larsen et al. demonstrated more than 50% reduction in pain in 3 quarters of patients who previously underwent varicocelectomy.16

In managing patients with orchialgia and a radiographic finding of a subclinical varicocele, a conservative approach is preferred initially. Surgical options such as varicocelectomy or spermatic cord denervation are not supported for subclinical varicocele. If surgery is to be resorted to, it should be considered in context of algorithm for chronic scrotal content pain. In that context, spermatic cord denervation may be considered. Transient symptom relief from a cord block can predict a favorable outcome. If no improvement was noticed after the cord block, pain management may be a potential alternative option. Further research remains a necessity to enhance our understanding of chronic scrotal pain and clarify whether subclinical varicocele is a significant contributor to pain or a mere coincidental finding. Based on the current evidence, surgical treatment of a subclinical varicocele is not indicated for scrotal content pain.

**REFERENCES**

1. Abrol N, Panda A, Kekre NS. Painful varicoceles: role of varicocelectomy. Indian J Urol 2014; 30: 369–73.
2. Biggers RD, Soder Dahl DW. The painful varicocele. Mil Med 1981; 146: 440–1.
3. Yaman O, Soygu T, Zumrutbas AE, Resorlu B. Results of microsurgical subinguinal varicocelectomy in children and adolescents. Urolology 2006; 68: 410–2.
4. Comhaire F, Kurinen M. Selective retrograde venography of the internal spermatic vein: a conclusive approach to the diagnosis of varicocele. Andrologia 1976; 8: 11–24.
5. Parekkatt SJ, Gudelegolu A, Brahmbhatt JV, Priola KB, Vieweg J et al. Trifecta nerve complex: potential anatomical basis for microsurgical denervation of the spermatic cord for chronic orchialgia. J Urol 2013; 190: 265–70.
6. Dubin L, Amelar RD. Varicocele size and results of varicocelectomy in selected subfertile men with varicocele. Fertil Steril 1970; 21: 606–9.
7. Hoekstra T, Witt MA. The correlation of internal spermatic vein palpability with ultrasonographic diameter and reversal of venous flow. J Urol 1995; 153: 82–4.
8. Singh V, Sinha RJ. Idiopathic chronic orchialgia – A frustrating issue for the clinician and the patient. Indian J Surg 2008; 70: 107–10.
9. Yeniyoll GO, Tuna A, Yener H, Zeyrek N, Tilki A. High ligation to treat pain in varicocele. Int Urol Nephrol 2003; 35: 65–8.
10. Yaman O, Ozdiler E, Anafarta K, Göğüş O. Effect of microsurgical subinguinal varicocele ligation to treat pain. Urology 2000; 55: 107–8.
11. Jungwirth A, Diemer T, Dohle GR, Giwercman A, Köpa Z, et al. European association of urology guidelines on male infertility: the 2012 update. Eur Urol 2012; 62: 324–32.
12. Kim HT, Song PH, Moon KH. Microsurgical ligation for painful varicocele: effectiveness and predictors of pain resolution. Yonsei Med J 2012; 53: 145–50.
13. Devine CJ Jr, Schellhammer PF. The use of microsurgical denervation of the spermatic cord for orchialgia. Trans Am Assoc Genitourin Surg 1978; 70: 149–51.
14. Marconi M, Palma G, Troncoso P, Deli Oro A, Diemer T, et al. Microsurgical spermatic cord denervation as a treatment for chronic scrotal content pain: a multicenter open label trial. J Urol 2015; 194: 1323–7.
15. Benson JS, Abern MR, Larsen S, Levine LA. 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.
16. Larsen SM, Benson JS, Levine LA. Microdenervation of the spermatic cord for chronic scrotal content pain: single institution review analyzing success rate after prior attempts at surgical correction. J Urol 2013; 189: 554–8.