

Painful varicoceles: Role of varicocelectomy

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ABSTRACT

The incidence of varicocele in the general population is up to 15%. It is estimated that the prevalence of pain with varicoceles is around 2-10%. Till the year 2000, only two studies evaluated efficacy of varicocelectomy in painful varicoceles with conflicting results. Over the past decade many other studies have addressed this issue and reported on the treatment outcome and predictors of success. We critically appraised studies published from March 2000 to May 2013 evaluating surgical management in painful varicoceles to provide an evidence based review of effectiveness of varicocelectomy in relieving pain in patients with symptomatic painful varicoceles. The association between varicoceles and pain is not clearly established. Conservative treatment is warranted as the first line of treatment in men with painful clinical varicoceles. In carefully selected men with clinically palpable varicoceles and associated characteristic chronic dull ache, dragging or throbbing pain who do not respond to conservative therapy, varicocelectomy is warranted and is associated with approximately 80% success. However, surgical success does not always translate into resolution of pain and pain might persist even when no varicoceles are detected postoperatively.

Key words: Orchialgia, pain, painful varicocele score, varicocele, varicocelectomy

INTRODUCTION

Varicoceles are detectable in approximately 15% of general adult male population.^[1] While pain was the earlier indication for varicocelectomy and its role in infertility was recognized later, there is more literature on the varicocelectomy for male infertility than for pain. The role of varicoceles in causation of testicular pain is less well-defined.

In his review of 4470 patients with varicoceles, Ivanissevich stated that varicoceles are rarely symptomatic.^[2] Tulloch described a case of 27-year-old male with azoospermia and bilateral varicoceles. Three months after varicocele treatment spermatozoa appeared in his semen and his wife conceived after 9 months.^[3]

Following this report research mainly focused on varicoceles in subfertile men and new surgical techniques evolved over next few decades. Studies have shown that varicoceles are present in 2-10% men with orchialgia.^[4] Biggers *et al.* published the first study evaluating surgical treatment for painful varicoceles in 1981.^[5] Till year 2000 only two studies evaluated outcome of surgery in painful varicoceles.^[4-6] While Biggers *et al.* reported complete resolution of pain in 48%; Peterson *et al.* reported success in 86%.^[4,5] The purpose of this article is to review the role of surgery and predictors of success in treatment of painful varicoceles.

A Pubmed/Medline search was performed in June 2013 with key words “varicocele,” “pain,” and “varicocelectomy.” Of 93 search results, the majority of studies were done in subfertile men and data for pain resolution were culled from this population. For this review we focused on studies specifically evaluating pain resolution after varicocelectomy published after year 2000. Critical appraisal of 13 studies from March 2000 to May 2013 was performed and an algorithm based on quantitative assessment is presented for guiding management of painful varicoceles [Figure 1].

STUDY DESIGNS

There is no randomized controlled trial evaluating efficacy of varicocelectomy for painful varicoceles. Most studies are retrospective case series and include small number of cases [Table 1]. No case control study is published till date.

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Table 1: Summary of various studies on treatment of painful varicoceles

Section	Study	Patients recruited	Patients followed	Follow up duration in months n (range)	Complete response n (%)	Partial response n (%)	No response n (%)	Comments
1A (Microsurgical)	Yaman <i>et al.</i> ^[6]	119	82	3	72 (88)	4 (5)	5 (6)	1 (1%) reported epididymal discomfort
	Chawla <i>et al.</i> ^[18]	12	11	12 (3-32)	6 (54)	4 (36)	1 (9)	All had previous failed varicocelectomy. Gubernacular and ESV ligated
	Altunoluk <i>et al.</i> ^[16]	284	237	3	203 (85.6)	15 (6.3)	19 (8.1)	Pain>3 months predicted success; No difference in quality or intensity of pain, and grade of varicocele
	Park <i>et al.</i> ^[11]	53	53	12.4 (5-34)	28 (52.8)	22 (41.5)	3 (5.7)	Normal BMI and pain duration predictor in multivariate analysis
	Armagan <i>et al.</i> ^[19]	72	72	54.4	57 (79.2)	NA	15 (20.8)	Complete response=VAS 0-1; Partial response grouped with failure
	Chen <i>et al.</i> ^[7]	84	76	24.1 (12-84)	55 (72.4)	NA	21 (27.6)	Complete and partial response grouped together; Greater pain score and longer pain duration significant predictors; Grade of varicocele, quality of pain not significantly different
	Kim <i>et al.</i> ^[10]	114	114	15.8 (13-49)	104 (91.2)	NA	10 (8.8)	Complete and partial response grouped together; Quality and intensity of pain were independent predictors
1B (Non microsurgical)	Kim <i>et al.</i> ^[20]	NA	81	12	58 (71.6)	16 (19.7)	7 (8.6)	Higher varicocele grade was only predictor ($P=0.026$)
	Ribe <i>et al.</i> ^[12]	25	25	3	22 (88)	NA	3 (12)	Complete and partial improvement grouped together
	Karademir <i>et al.</i> ^[13]	144	121		74 (61.1)	27 (22.3)	19 (15.7)	Symptoms worsened in 1; Response greater in those who had ESV ligated; no difference in grade of varicocele and character of pain
1C (Laparoscopic)	Al-Buheissi <i>et al.</i> ^[14]	83	68		52 (76.5)	9 (13)	7 (10.5)	5/7 with partial response eventually recurred
	Maghraby ^[8]	68	58	6 (3-19)	49 (84.5)	6 (10.3)	3 (5.2)	2/3 had persistent varicocele, 1/3 had hydrocele. Second varicocelectomy resulted in pain relief; hydrocelectomy did not
	Park and Lee ^[21]	77	67	6	32 (47.8)	17 (25.4)	18 (26.9)	Only large duration of pain was independent predictor; Lower success attributed to characteristics of study population (Policemen)
Overall			1065		812 (76.24)		131 (12.3)	

ESV=External spermatic vein, VAS=Visual analogue scale

CONSERVATIVE TREATMENT

In all studies, conservative treatment was tried before surgery for a variable duration of time. Conservative treatment included scrotal support, oral non-steroidal anti-inflammatory medicine, and limitation of physical activity like lifting weights and strenuous activity. While no study has reported on efficacy and acceptance of conservative treatment; in a study by Yaman *et al.* five of the 119 patients had their pain resolved after conservative treatment.^[6] In another study 15/99 (15.2%) men experienced resolution of pain after 4 weeks of conservative treatment.^[7] Limitation of

physical activity may not be acceptable in military recruits, athletes, and policemen.

SURGICAL APPROACH

No study has compared the efficacy of different techniques of varicocelectomy for pain resolution. There is a trend toward microsurgical varicocelectomy. Maghraby reported 84.5% complete response rate and 10.3% partial response with only 3/58 patients having persistent symptoms after laparoscopic varicocelectomy. One patient developed hydrocele and two (3.4%) had persistent varicoceles.^[8] Contemporary series

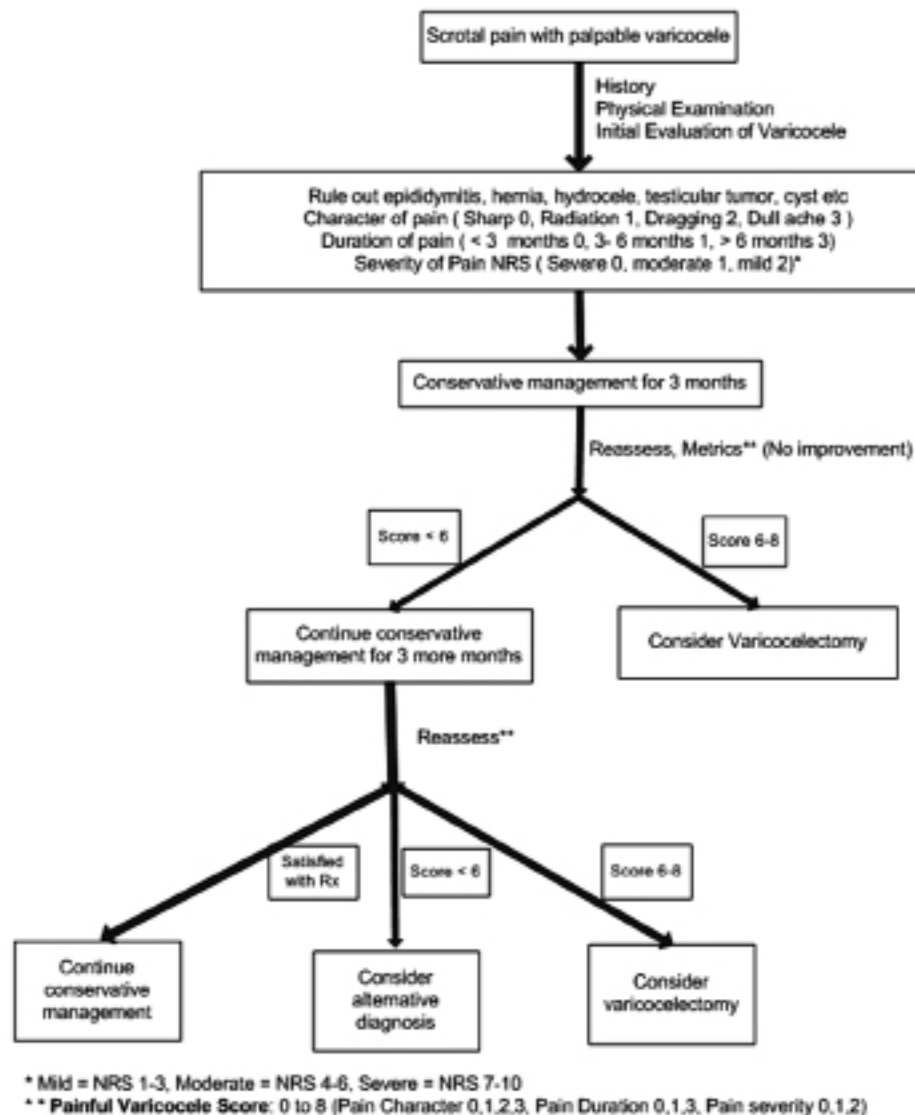


Figure 1: Algorithm for management of painful varicoceles

of microsurgical inguinal/subinguinal approach have shown similar results.^[9] Kim *et al.* operated 114 patients of painful varicoceles with microsurgical inguinal approach. Overall response was 91.2% while 8.8% had pain postoperatively.^[10] In another study, 72.4% responded while 27.6 did not respond to microsurgical subinguinal varicocelectomy.^[7] Park *et al.* used microsurgical inguinal or subinguinal approach and reported complete, partial, and no response in 52.8, 41.5, and 5.7%, respectively.^[11] Overall response with non-microscopic open technique has also been similar with slightly more partial response than complete.^[12-14]

PREDICTORS OF SUCCESS

Most patients with chronic orchialgia do not have varicoceles and majority of patients with varicoceles are asymptomatic. The presence of pain in men with varicocele may be related to some other pathology. Careful evaluation is recommended to

rule out epididymitis, hydrocele, inguinal hernia, testicular tumor, and epididymal cyst etc.^[9] In the absence of any clinical finding, some men may have idiopathic orchialgia. Due to absence of a clear cause - effect relationship between varicoceles and orchialgia, many predictors of successful outcome have been studied.

Grade of varicocele

All studies accept the varicocele grading system defined by Lyon *et al.*^[15] The American Urologic Association and European Association of Urology guidelines recommend that only clinically palpable varicoceles (Grade I, II, and III) should be considered for treatment. All studies have excluded men with subclinical varicoceles.

Yaman *et al.* reported outcome in 82 patients with at least 3 months follow up after varicocelectomy. 88% (72/82) had complete response, 11% did not respond (9/82), and

1% (1/82) had epididymal discomfort which resolved after conservative management. Among non responders varicocele was grade III in 6.1% (5/82), grade II in 3.6% (3/82), and grade I in 1.2% (1/82).^[6] However, they included four patients with partial response in their analysis and did not comment on statistical significance of their results. Others did not find significant difference in varicocele grade between responders and non-responders.^[7,10,11,16] In study by Chen *et al.* percentage of responders vs. non-responders in grade I, II, and III was 21.8% vs. 23.8%, 50.9% vs. 47.6%, and 27.3% vs. 28.6%, respectively.^[7]

Character of pain

Pain due to varicoceles is characteristically dull, aching, or dragging in nature. Pain is worsened by physical activity and on prolonged standing. Peterson *et al.* described that for successful outcome of surgery, pain must be dull aching and throbbing without any sharp component or radiation.^[4] Kim *et al.* on multivariate analysis found that quality of pain is an independent predictor of success. They reported 100% success when pain was dull in nature. Of 114 treated patients ten (8.8%) did not respond to treatment. Often non-responders eight had aching pain while two had dragging pain. None of the patient had sharp component in their series.^[10] Others did not find significant relation between pain character and response to surgery.^[7,11,16] No patient with sharp pain failed treatment in study by Park *et al.*^[11]

Character of pain is essentially a subjective parameter. Different patients may describe their pain differently. This might be the reason for variable results in literature with respect to relation between pain character and treatment outcome.

Duration of pain

Studies have used varying cut-off criteria for pain duration.^[7,10,11,16] In one study, mean duration of pain in whole group and in non-responders was 13.7 months and 4.2 months, respectively.^[10] However, on multivariate analysis this difference was not significant. This study did not use cut off limit to divide groups according to duration of pain. Other studies using cut off of 3, 6, and 9 months found significant difference in response rate. Patients with longer duration of pain before surgery had better outcome.^[7,11,16] Success rate was 98.6% in group who had pain for more than 3 months while 17.7% with duration less than 3 months failed treatment.^[16]

This highlights the importance of carefully selecting patients for surgery. There are many other causes for orchialgia. Given time, pain due to other reasons might resolve. However, if surgery is considered early these cases are likely to fail.

Intensity of preoperative pain

Severity of pain has been evaluated in few studies. Altunoluk *et al.* did not find any difference in intensity of pain in responders and non-responders.^[16] The same study did not

find any significance of quality of pain. It is important to note that authors did not quantify pain. Kim *et al.* used 11-point numeric rating scale (NRS) for pain quantification.^[10] Degree of pain resolution was related in multivariate analysis to low pain score (<7). Non-responders had higher preoperative NRS scale (mean 9; range 7-10). In contrast, study using 10 cm visual analogue scale (VAS) showed that responders had greater preoperative pain score (>6).^[7] There was significant overlap in VAS pain score between two groups (Mean; 95% CI Responders: Non-responders = 6; 2.8-9.3; 4; 1.4-6.6).^[7]

VAS and NRS provide almost identical results and are equally sensitive in assessing intensity of acute pain after surgery.^[17] NRS with numbers from 0 to 10 is more easily understood by patients than VAS.^[10,17] These are the best tools for assessment of patients' subjective feeling of pain intensity. Pain memory is often not accurate and this limits the use of these scales for assessment of chronic pain. This, combined with different follow up duration, makes any conclusion difficult. Quantifying pain using NRS at initial evaluation and during follow up visits; while patient is given trial of conservative treatment; may be more representative than assessment made once at the time of first visit.

Recurrence of varicocele

In general, persistence of pain after surgery is poorly correlated with persistence of varicoceles. In one study, varicocele recurrence was detected in 1/19 non-responders; 17 of them had pain duration of less than 3 months.^[17] In another study none of patients with recurrent pain had varicocele when tested with Doppler ultrasound.^[11] Pain in these patients probably was not due to varicocele. This highlights the importance of careful patient selection for surgery.

External spermatic vein ligation

Chawla *et al.* selected 11 men with failed varicocelectomy who had persistent pain after surgery.^[18] All had non-microsurgical repair previously. Authors performed microsurgical subinguinal varicocelectomy and ligated gubernacular as well as ESV. Ten men experienced significant improvement in pain. In other study 92.4% who underwent ESV ligation experienced complete response, while only one patient had complete response when ESV was not ligated.^[13]

Body mass index

Association between BMI and pain response was first reported by Park *et al.*^[11] All failures were in patients with BMI > 22 Kg/m². In other study BMI in responders and non-responders was 21.3 and 22.1 Kg/m², respectively though difference was not statistically significant.^[7] In multivariate analysis BMI was not significant predictor of response.^[10]

Other predictors

Sperm quality, semen pH, testicular volume, semen volume, FSH, LH, testosterone, maximum vein diameter, peak

retrograde flow on Doppler, distance from renal hilum to center of scrotum, and scrotal temperature have been evaluated as predictors of success but none has reached statistic significance.^[7]

SYSTEMATIC APPROACH TO MANAGEMENT

Based on our review, we suggest a painful varicocele score (PVS) factoring in duration of pain, character, and intensity of pain [Figure 1]. This assessment should be done at initial visit and repeated at 3 and 6 months while patient is on conservative management. Decision to operate varicocele can be taken if PVS is 6 or more.

CONCLUSION

The presence of varicocele in men with orchialgia is a diagnostic and treatment challenge. While subclinical varicoceles are insignificant, grade of palpable varicocele has poor correlation with symptoms and treatment outcome. Careful history and examination are mandatory to rule out other causes of pain. Each evaluation of painful varicocele must include a checklist of characteristics (Duration, Character, and Intensity of pain) with metrics or grading system. Conservative treatment should always be the first line of treatment.

Varicocelectomy in carefully selected men with clinically palpable varicoceles is associated with approximately 80% success. Surgical success does not always translate into resolution of pain. Pain might persist even when no varicoceles are detected postoperatively. Failures may be due to a wrong diagnosis. Although the literature suggests that microsurgical varicocelectomy has fewer complications and recurrences, the literature on surgical treatment of painful varicoceles is limited and it is not possible to make a surgical recommendation. Continued research and randomized studies with longer follow up are needed to solve the question of which patient will benefit from surgery for painful varicoceles. Till further studies are available PVS can be used to evaluate the level of pain for each patient and to guide management.

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