

Research Article

Characterization of Pain in Varicocele and the Role of Varicocelectomy in Relieving Pain: A Single Center Prospective Study

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Abstract

Introduction: Varicocele is found in up to 15 % of young males. Although asymptomatic in most cases, it can present with pain, infertility, testicular atrophy or visible swelling. Despite pain is considered as one of indications for varicocelectomy, its application is somewhat controversial.

Aim: To analyze the characteristics of pain in patients with varicocele and the outcome of varicocelectomy surgeries on pain perception.

Patient and Methods: In a 14-month period, 36 consecutive patients with pain secondary to varicocele were prospectively enrolled in the study and underwent varicocelectomy. History, physical exam, detailed explanation of pain, its type, distribution, exacerbating and relieving factors, analog numerical scaling, scrotal ultrasound, and semen analysis evaluated before and after surgery. Patients followed for one year after surgery.

Results: 30 of 36 patients completed the study with appropriate follow up visits. Patients were 17 to 34-year-old (mean 24.5±4). In 57% of patients, pain was the only presenting symptom. Pain was explained as sharp in 11 (36%), burning in 5 (17%), dull in 4 (13%) and vague, hard to explain in 10 (33%). Pain most commonly was experienced in scrotum, inguinal and lower abdominal area. After surgery, 12 patients (40%) had complete relief of pain. Seven patients (23%) had significant relief; seven patients (23%) had moderate relief. Overall 26 patients (87%) had moderate (more than 50%) to complete pain relief (P<0.005). Four patients had minimal or no improvement in pain after surgery.

Conclusion: Pain related to varicocele is mainly experienced in the scrotum, inguinal and lower abdominal area. Varicocelectomy completely or significantly resolves the pain in up to 86% of patients.

Introduction

Varicocele is abnormal collection of dilated veins within the pampiniform plexus of the spermatic cord [1, 2]. They are most commonly associated with infertility and are found in approximately 35-40% of men with primary infertility [3], and in 75-81% of men with secondary infertility [4] (versus 15-20% of the general male population). They can also cause significant pain in as high as 14% of patients [3, 5]. Although this pain is generally poorly characterized, the most common description is a dull aching pain that gets worse after exercise or straining [2, 6-8]. The primary treatment of varicocele is surgical ligation or embolization of the

testicular veins [4, 7]. Varicocelectomy is standard approach in the treatment of infertility and prevention of testicular atrophy [4], but the role of varicocele repair in relieving pain remains somewhat controversial. Currently the American Urological Association only has guidelines for the implementation of varicocelectomy for infertility [9] and do not mention specifically to pain. However, success rates of reducing pain post varicocelectomy have been reported to range from 48 to 88% [1,4,10]. In this prospective trial, we evaluated the effects of varicocelectomy on relieving pain as well as the characteristics and nature of pain associated with varicocele.

Patients and Methods

A single institution, prospective study performed over a 14-month period with Institutional Review Board (IRB) approval. All patients diagnosed with varicocele and pain as one of their presenting symptoms, who elected to undergo varicocelectomy, enrolled in the study. Prior to surgical treatment, all subjects were required to have previously failed conservative management with Non-Steroidal Anti-Inflammatory Drugs (NSAIDS) and scrotal support. Subjects with other potentially painful pathologies such as epididymitis or epididymal cyst, testicular torsion, trauma, or inguinal hernia excluded from the study. After obtaining history and doing physical exam, patients completed a questionnaire characterizing their varicocele pain. The questionnaire included questions regarding the type of pain (sharp, dull, burning, or vague), its location, exacerbating and alleviating factors. An analog numerical scale completed by patients that corresponded to the level of pain they felt. Scrotal ultrasound and semen analysis performed before and after varicocelectomy. Varicoceles graded based on World Health Organization (WHO) grading: Grade I: palpable just with Valsalva maneuver; Grade II: Varicocele palpable without Valsalva; Grade III visible varicocele. Pain relief based on numerical patient scores before and after surgery was categorized to, 1- complete relief, 2- significant relief, 3- moderate relief, 4- minimal relief, 5- no relief, 6- worsening of pain. Four to 6 months following surgery, patients followed with history, physical exam, Doppler ultrasound and semen analysis. Patients again completed the pain characteristic questionnaire and analog numerical scaling. Pre and post-surgery data compared and analgesia requirements assessed.

Results

Thirty-six patients met criteria for this study. Of these 36 patients, only 30 completed follow up. Mean follow up was 7.4 (± 2.1) months (Figure 1).

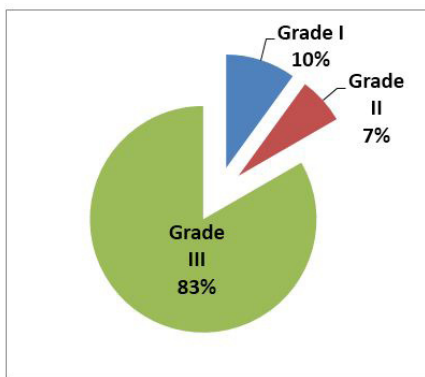


Figure 1: Grading of varicocele in our patients based on WHO grading system.

Fig 1 demonstrates the percentage of patients presenting with different grades of varicocele based on WHO criteria. The majority of patients (83%, n = 25) presented with grade III varicocele while patients presenting with a grade II (n = 2) or grade I (n = 3) made up the other 17% collectively. Surgical approach in 23 patients (77%) was inguinal and in 7 cases (23%) was high ligation (retroperitoneal). Of note, the majority of patients (90%) presented with a left sided varicocele while only 10% presenting with bilateral varicocele. Regarding pain characterizations, sharp and dull pain were the most commonly reported pain qualities seen in 37% (n = 11) and 33% (n = 10) of patients respectively (Figure2).

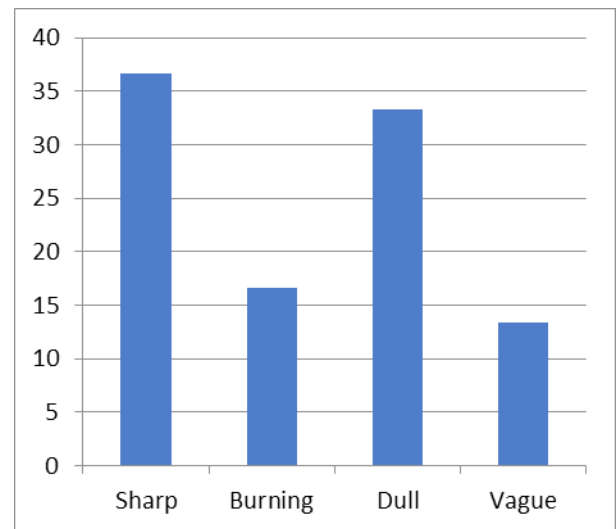


Figure 2: Characteristics of pain reported by patients.

A burning sensation in the scrotum was found in five patients (17%) while only 4 patients described their pain as being vague (13%). Pain experienced mainly in the scrotum, inguinal, and lower abdomen, with some overlapping areas .

Factor	N	%
Exertion	7	23
Tight Clothing	2	7
Cold weather	1	3
Unknown	20	67

Table 1: Self-reported exacerbating and alleviating Factors.

Table 1 illustrates commonly identified alleviating and exacerbating factors contributing to pain secondary to varicocele. 23% (n = 7) of patients reported increased pain with walking, standing, or lifting heavy objects. Two patients (6%) reported that wearing tight fitting pants exacerbated their pain. One patient (3%) mentioned cold weather as an exacerbating factor for his

pain. Lastly, a good portion of patients (67%; n= 20) could not describe any factor that made their pain better or worse on a regular basis. Considering pain location, there were 4 main areas in which patients reported pain: scrotum, inguinal region, lower abdomen, and flank. Overall, the most common location of pain was in the scrotal region. 48 % of patients experienced their pain mainly in this region. Some other involved areas werelower abdomen, inguinal area, and upper thigh. We combined these data points and included an anatomical figure to display these areas of overlap. (Figure 3A, 3B).

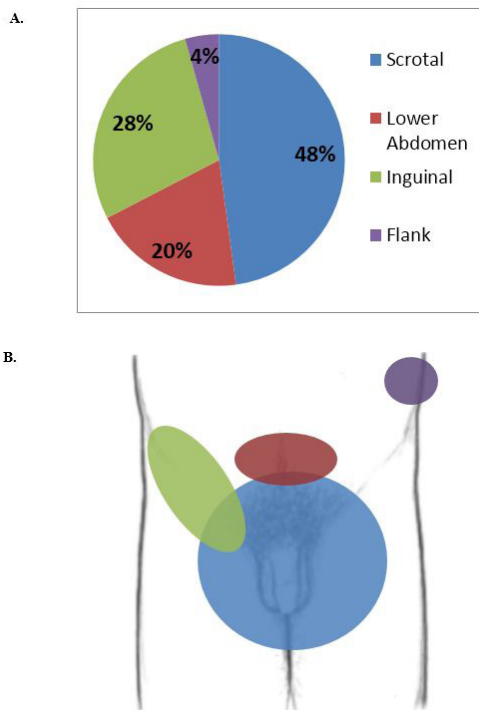


Figure 3: Distribution of reported varicocele pain (3A): Incidence of pain reported in different locations; (3B): Location of pain experienced with many areas of overlap.

A smaller percentage of patients experienced pain only in their inguinal region, or their lower abdomen with areas of overlap. The least common location for pain was in all four regions or in only the flank region. After varicocelectomy we sought to define the level of pain relief experienced post operatively. 40 % of patients had complete resolution of varicocele pain while 23% of patients experienced significant (greater than 75%) or and another 23% experienced moderate (greater than 50%) improvement in pain. Overall, 86% of our patients had 50% or greater reduction of their pain post varicocelectomy. Only 7% of our patients' experienced minimal improvement in their pain and in another 7% of patients experienced no pain relief at all. No patients experienced increased pain after surgery (Figure 4).

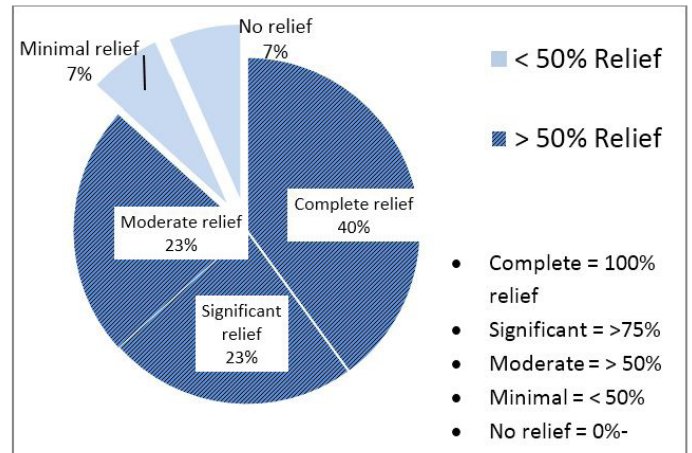


Figure 4: Patients assessment of pain relief

There were some complications with surgery (Table2).

Complication	N	%
Recurrence	5	17
Hydrocele	1	3
Hematoma	1	3
None	23	77

Table 2: Postoperative complications

Table 2 depicts the percentage of complications post varicocelectomy. Five (16%) patients had recurrence of varicocele. Of those five patients, two underwent varicocelectomy using a high ligation technique, while three underwent an inguinal approach. Only one patient (3%) developed hydrocele and another patient (3%) developed inguinal hematoma postoperatively leading to a wound infection. Lastly six months after surgery, we asked all patients the following question: "Regarding pain relief from your surgery, do you think your surgery was successful?" Twenty-six of the 30 patients responded positively (87%).

Discussion

Varicocele is a very common abnormality in young adult males with an incidence approaching 15% in the general male population. Although most varicoceles are asymptomatic [11], infertility, scrotal pain, visible bulk of veins, and testicular atrophy are the most common symptoms and complaints. Treatment of painful varicocele usually begins with conservative management. The efficacy of conservative management techniques with NSAIDs, scrotal support, and the avoidance of exacerbating factors have not been evaluated, but recent prospective study evaluating the predictors of success for varicocelectomy found that of 145 patients, only 7 patients (4.6%) who were awaiting surgery resolved their pain conservatively [12]. For those men

who fail conservative treatments, varicocelectomy is a potential option. In this prospective analysis, we found that 87% of subjects achieved greater than 50% pain relief after varicocelectomy. This is comparable to a number of studies demonstrating 70%-90% pain relief in their cohorts (Table 3).

Study	Year	Study Type	Surgical Techniques	Number of Patients	% Relief*	Pain Relief
Peterson, et al. [13]	1998	Retrospective	Various	30 / 35	86	Complete resolution
Yaman, et al.	2000	Retrospective	Sub inguinal microsurgical	72 / 82	88	Complete resolution
Maghraby [14]	2002	Retrospective	Laparoscopic varicocelectomy	49 / 58	85	Complete resolution
Ribe, et al.	2002	Prospective	Sub inguinal ligation	22 / 25	88	Complete resolution or improvement
Yenigol, et al.	2003	Retrospective	High Inguinal ligation	72 / 87	82	Complete resolution
Tung, et al.	2004	Retrospective	Modified approach	28 / 31	90	Complete resolution
Kim HT, et al. [7]	2012	Retrospective	Microsurgical varicocelectomy	95 / 104	91	Complete resolutions or marked improvement
Kachrilas, et al. [10]	2014	Prospective	Laparoscopic varicocelectomy	42 / 48	88	Significant Improvement

* Pain reduction

Table 3: Studies on pain reduction post varicocelectomy

Several of these studies were retrospective which may bring up the issue of recall bias and selection bias as patients selected for varicocelectomy may report their pain as completely resolved the further out data retrieval achieved. To our knowledge, this is the first prospective analysis of this topic. In our study, there was no difference between sharp pain and dull pain experienced in patients with varicocele. This is inconsistent with the literature, reporting that varicocele pain is characteristically dull, aching, or dragging in nature [15]. Peterson et al found that in 31 of 35 men the varicocele pain described as a dull throbbing ache, while two described it as sharp and another two described it as a pulling sensation. Furthermore, Peterson’s study suggested that in order for surgery to be successful, the pain must be characteristic of varicocele and not be sharp or have any radiation [13]]. However, in our study we found that of 30 patients, 11 described their pain as sharp while another 10 described their pain as dull. Although we did not stratify quality of pain with percent of pain relief experienced, overall 87% of the patients in our study experienced moderate to complete pain relief. Similarly, Park et al found that no patient with sharp pain failed treatment [16]. A reason for the variability may be subjectivity of pain perception and the fact that different patients may describe or sense their pain differently. Classically, varicocele pain exacerbates by sitting, standing, or by physical exertion. Usually patients may describe the pain getting worse after prolonged standing and relieved by lying down [12]. We found this to be true in only 23% of patients. More surprisingly, we found that 67% of patients could not articulate what made their pain worse. We are uncertain what may have contributed to this finding. In our series, most of the patients had pain for more than

one year (67%) and only experienced pain relief or improvement postoperatively. This may suggest that patients with chronic varicocele experience chronic consistent pain that is unmoved by daily activities that usually exacerbates pain. Other exacerbating factors we found were cold weather and tight fitting clothing.

In our series, there were 83% of patients with grade III varicocele, which is much higher than the normal distribution of different grades between varicocelectomy patients. Maghraby, et al. [14] found grade III varicocele in 50% of their patients [14] Since our patients all had pain, we believe that those who present with a higher grade varicocele (grade III) have a higher chance of experiencing pain secondary to varicocele. Nonetheless, our data shows that patients with pain and varicocele have higher grades of varicocele (83% grade III) comparing to general population. There were five recurrent varicoceles in our series of patients. The correlations between varicocelectomy outcome and pain relief in our series is not very clear. Two patients with minimal improvement in pain after surgery had recurrence of their varicocele (which decreased from grade III to grade II in physical exam and Doppler ultrasound). One patient with varicocele recurrence reported complete relief of pain and another patient with recurrence after surgery reported significant pain relief. Dissection and excising the nerve during the surgery or sham effect of surgery could be the possible explanations.

Limitations

One of the limitations of this study was the fact that we did not investigate the severity of pain in relation to varicocele grading

scale. In not doing so, we were unable to differentiate whether a grade III, II, or I varicocele corresponded to feeling a sharp or dull pain. Since 83% of our patients had grade three varicocele, any subgrouping between groups was inconclusive because of scarcity of patients with grade I and grade II varicocele. In addition, as mentioned above, pain perception is subjective. We did not record the quality of pain experienced in those with minimal relief or no pain relief after varicocelectomy. This data would allow us to determine whether varicocelectomy could change the quality of pain. Lastly, although being prospective makes it more reliable than retrospective studies, this study consisted of a single institution, which could potentially contribute to selection bias.

Conclusion

Varicocelectomy is an effective treatment for pain relief. Overall 87% of our subjects had greater than 50% pain reduction after their procedure. Pain related to varicocele is mainly experienced in the scrotum, inguinal and lower abdominal area. Larger prospective studies are needed to further assess the effects of different surgical methods of varicocelectomy in relieving pain and to further characterize pain secondary to varicocele and its relation to varicocele severity.

References

1. Alsaikhan B, Alrabeeah K, Delouya G, Zini A (2016) Epidemiology of varicocele. *Asian J Androl* 18: 179-181.
2. Muthuveloe DW, During V, Ashdown, Rukin NJ, Jones RG (2015) The effectiveness of varicocele embolization for the treatment of varicocele related orchalgia. *Springerplus* 4: 392.
3. Armagan A, Ergun O, Bas E, Oksay T, Koşar A (2012) Long-term effects of microsurgical varicocelectomy on pain and sperm parameters in clinical varicocele patients with scrotal pain complaints. *Androl* 44: 611-614.
4. Reddy SVK, Shaik AB, Venkataramanaiah M (2015) Outcome of varicocelectomy with different degrees of clinical varicocele in infertile male. *Adv in Adrol* 2015.
5. Kim SO, Jung H, Park K (2012) Outcomes of microsurgical subinguinal varicocelectomy for painful varicoceles. *J Androl* 33: 872-875.
6. Altunoluk B, Soylemez H, Efe E, Malkoc O (2010) Duration of preoperative scrotal pain may predict the success of microsurgical varicocelectomy. *Int Braz J urol* 36: 55-59.
7. Kim HT, Song PH, Moon KH (2012) Microsurgical Ligation for painful varicocele: effectiveness and predictors of pain resolution. *Yonsei Med J* 53: 145-150.
8. Chiba K, Ramasamy R, Lamb DJ, Lipshultz LI (2016) The varicocele: diagnostic dilemmas therapeutic challenges and future perspectives. *Asian J Androl* 18: 276-281.
9. Sharlip ID, Jarow J, Belker AM, Damewood M, Howards SS et al. (2001) Report on varicocele and infertility. American Urological Association, and American Society for Reproductive Medicine.
10. Kachrilas S, Popov E, Bourdoumis A, Akhter W, Howairis M, et al. (2014) Laparoscopic Varicocelectomy in the management of chronic scrotal pain. *JSLs* 18: 2014.00302.
11. Mehta A, Goldstein M (2013) Microsurgical varicocelectomy: a review. *Asian J Androl* 15: 56-60.
12. Ellatif MEA, Asker W, Abbas A, Negm A, Al-Katary M, et al. (2012) Varicocelectomy to treat pain, and predictors of success: a prospective study. *Curr Urol* 6: 33-36.
13. Peterson AC, Lance RS, Ruiz HR (1998) Outcomes of varicocele ligation done for pain. *J urol* 159: 1565-1567.
14. Maghraby HA (2002) Laparoscopic varicocelectomy for painful varicoceles: merits and outcomes. *J Endourol* 16: 107-110.
15. Abrol N, Panda A, Kekre NS (2014) Painful varicoceles: role of varicocelectomy. *Indian J Urol* 30: 369-373.
16. Park HJ, Lee SS, Park NC (2011) Predictors of pain resolution after varicocelectomy for painful varicocele. *Asian J Androl* 13:754-758.