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# Testicular pain improvement after microsurgical subinguinal varicocelelectomy

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**Abstract**--Background: Approximately 2–10% of patients with varicocele complain of testicular pain. When conservative therapy fails to relieve the pain, Varicocelelectomy is the surgical choice. The success rate of varicocelelectomy for testicular pain has varied among studies. This prospective study aimed to investigate success rate of microscopic subinguinal varicocelelectomy performed for the treatment of painful varicocele. Aim: To assess the efficacy of microsurgical subinguinal varicocelelectomy for relief of testicular pain. Methods: The study was conducted at KasrAlainy school of medicine on 25 male patients who did not have infertility concerns and underwent microscopic subinguinal varicocelelectomy with standard and pulling techniques after failed conservative treatment for 3 months. Results: 25 patients with testicular pain due to varicocele underwent microsurgical subinguinal varicocelelectomy, 92% of patients had resolution of pain on follow up. Conclusion: Microscopic subinguinal varicocelelectomy is an effective surgical alternative for testicular pain.

**Keywords**---Pain relief, Testicular pain, Varicocele, microsurgical, Varicocelelectomy.

**Introduction**

Varicocele is an abnormal dilatation of the pampiniform plexus of veins in the spermatic cord(1). The prevalence of varicocele is estimated as 15%. the most

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common clinical presentations are infertility and chronic scrotal pain (1). Varicocelectomy is usually indicated in patients with infertility, adolescents with testicular hypotrophy, and patients with persistent pain (2). Approximately 2–10% of patients with varicocele complain of scrotal or inguinal pain (3).

For patients who experience persistent pain despite conservative treatment, varicocelectomy is an option (4). However, its success rate has varied among studies, and different variables have been reported as prognostic factors for pain relief after varicocele ligation (5). Therefore, we evaluated the success rate of the procedure. Among various techniques of treating varicocele, microsurgical varicocelectomy is considered the gold standard technique in both adults and adolescents, due to relatively lower postoperative recurrence and complication rates.(6)

### **Materials and Methods**

From December 2018 to March 2020, 60 patients underwent microscopic subinguinal varicocelectomy in the department of Urology at Kasralainy hospitals. Of these men, 35 were operated for infertility and 25 for varicocele associated scrotal pain. 10 patients who had acute urogenital infection, concomitant inguinal hernia or varicocele associated with other findings that cause testicular pain were excluded from the study.

### **Sample size characteristics and randomization**

The study involved 25 patients who did not have infertility concerns and underwent microscopic subinguinal varicocelectomy with or without cord pulling for only varicocele-associated testicular pain following failed conservative treatment (limitations in activity, scrotal elevation, and nonsteroidal anti-inflammatory medications) for 3 months. This study was approved by the local Research Ethical Committee of the Urology department in Cairo University hospitals, and written informed consent was obtained from all patients. Randomization was performed by the closed envelope method with a single blind arm.

### **Interventions**

A varicocele was diagnosed based on physical examination followed by Doppler ultrasound findings. The grades of varicocele were defined as grade I, only palpable with Valsalva maneuver; grade II, easily palpable without Valsalva maneuver but not visible; and grade III, palpable and visible (7). The demographic data of patients (age & body mass index), clinical grading (I, II, or III), the side (unilateral or bilateral) and quality of pain before surgery, intraoperative findings, and complications.

The severity of pain was assessed using an 10-point numerical rating scale (NRS) pain score, where 0 indicated the absence of pain and 10 indicated the worst pain possible (8). The microscopic subinguinal varicocelectomy was performed by three experienced surgeons by using two main techniques namely standard technique and cord pulling technique.

## **Outcomes**

Surgical success was defined as pain relief and a score of 0 on the 10-point NRS after the procedure. Failure was defined as the persistence of pain and a score of  $\geq 1$  on the 10-point NRS. All patients were asked to follow-up at 3 months and 6 months after surgery. Follow-up included physical examination, assessment of postoperative pain by 10-point NRS, and Doppler ultrasound to assess varicocele recurrence.

## **Sample size**

A sample size of at least 25 procedures is needed to demonstrate the effect of microsurgical subinguinal varicocelectomy for relief of varicocele associated pain taking into consideration a significance level of 0.05, power of 90%, a mean difference of 2 and a standard deviation of 3.

## **Statistical analysis**

The MedCalc version 19.5.1 (MedCalc Software Ltd, Ostend, Belgium) software for Windows were used for statistical analysis.

## **Results**

The present study included 25 patients with age range between 17 and 48 years old with 23 adults (>20 years) (92%) 2 adolescents (12- 18 years) (8%), the study didn't include any pediatric patients. These 25 cases were classified by side as follows: 15 cases (60%) unilateral (Left) while 10 cases (40%) bilateral. Among 25 patients who did MSV for scrotal pain, 23 patients (92%) had resolution of pain on follow up (10 cases using pulling technique (100%) and 13 cases using standard technique (86.7%) with a score of 0 on the 10-point Numerical scale (NRS) while 2 patients (8%) reported persistent pain with either no change or very mild change on the 10-point NRS for pain after standard technique (mean points on 10-point NRS pain score,  $4.05 \pm 1.7$  points) after microsurgical varicocelectomy as shown in figure (1) ( $P < 0.0001$ ). 1 case (4%) had recurrent varicocele after MSV with clinical varicoceles scheduled for 2<sup>nd</sup> surgery. Only 1 patient (4%) had postoperative wound infection with gapping and purulent discharge after MSV and was managed with frequent dressing and oral antibiotics. Univariate analysis showed that no preoperative parameter was predictive of pain resolution for patients who underwent varicocelectomy

## **Discussion**

Currently, microscopic subinguinal varicocelectomy is the standard approach for the treatment of patients with varicocele (9). The results of this study extend our knowledge of the true success rate of varicocelectomy for testicular pain, with a more specific definition of success than that reported in previous studies. Most patients (92%) reported complete resolution of pain. Only 8% experienced persistent pain, and one of them (4%) had recurrent varicocele, as examined using Doppler ultrasonography during follow-up that could be related to chronic orchialgia, Despite the clinical significance this was not statistically significant.

Microsurgical spermatic cord denervation has been described to treat chronic orchialgia; however, this procedure was not performed in the current study (10). Several studies reported scrotal pain improvement following MSV, Armağan et al reported that the complete success for scrotal pain control after varicocelectomy were 73–86% and found no association between varicocele grade and pain resolution after surgery (11).

Kim et al found that 76.5% of patients experienced a marked or complete resolution of pain after MSV among 81 patients while 19.7% of patients experienced partial resolution and 8.6% of men reported no change(12). These variations in success rates could be a result of differences in the definition of success, surgical approach and techniques, or follow-up duration after surgery. Reported predictors for postoperative pain resolution have included the varicocele grade and the quality and severity of preoperative pain (3) (9)(12)(13).

Kim et al. (12) stated that a significant number of patients who presented with dragging, dull, and aching pain experienced pain resolution after varicocelectomy. All our patient complaints matched these pain criteria but without significant correlation with pain relief, similar to those in other studies (14)(15).

In accordance with the finding of Karademir et al. (16), preoperative pain intensity and pain resolution were not correlated. However, Chen et al. (9) suggested that a preoperative pain score of > 6 could be predictive of symptomatic relief. Abd Ellatif et al. (14) reported no association between varicocele grade and pain relief after surgery. However, another study demonstrated that the preoperative grade of varicocele affected pain relief, where persistent pain was more common in patients with high-grade varicocele (13).

The duration of preoperative pain was another reported predictor of postoperative pain resolution (5)(14)(15) (17). Abd Ellatif et al., Park et al., and Altunoluk et al. identified long pain duration before surgery (> 6, > ≥ 3, and > 3months, respectively) as the only factor associated with pain resolution (14) (15)(17). In contrast, in one study (5), a short preoperative pain duration of < 6 months predicted postoperative pain resolution. Our study showed an insignificant relation between pain relief and the duration of preoperative pain.

Possible explanations for these variations in the duration of pain as a predictive factor are differences in pain duration criteria and the definition of success. Hence, further prospective randomized studies are required. Moreover, some studies have reported subinguinal ligation and microsurgical varicocelectomy as more effective in relieving varicocele-associated pain than other surgical techniques (12)(18). However, in our study, we adopted only the gold standard microscopic subinguinal approach.

In another study, greater number of ligated veins (>7) was a significant prognostic factor for pain relief after varicocelectomy (9). The limitations of this study include a relatively short median follow-up of just over 1 year. Given that patients with bilateral varicoceles have two different varicocele grades, there was an uneven distribution of patients for the varicocele grade, creating a potential for bias. In addition, not including other predictive factors such as varicocele location, and

number of ligated veins could have potentially affected the pain resolution and success rate after varicocelectomy.

## Conclusion

Microsurgical subinguinal varicocelectomy for testicular pain has high success (92%) and low complication rates when performed in selected patients after failed conservative treatment. A prospective randomized study with a larger sample size and long-term follow-up covering all the different prognostic factors for a painful varicocele is essential to validate the findings of the present study.

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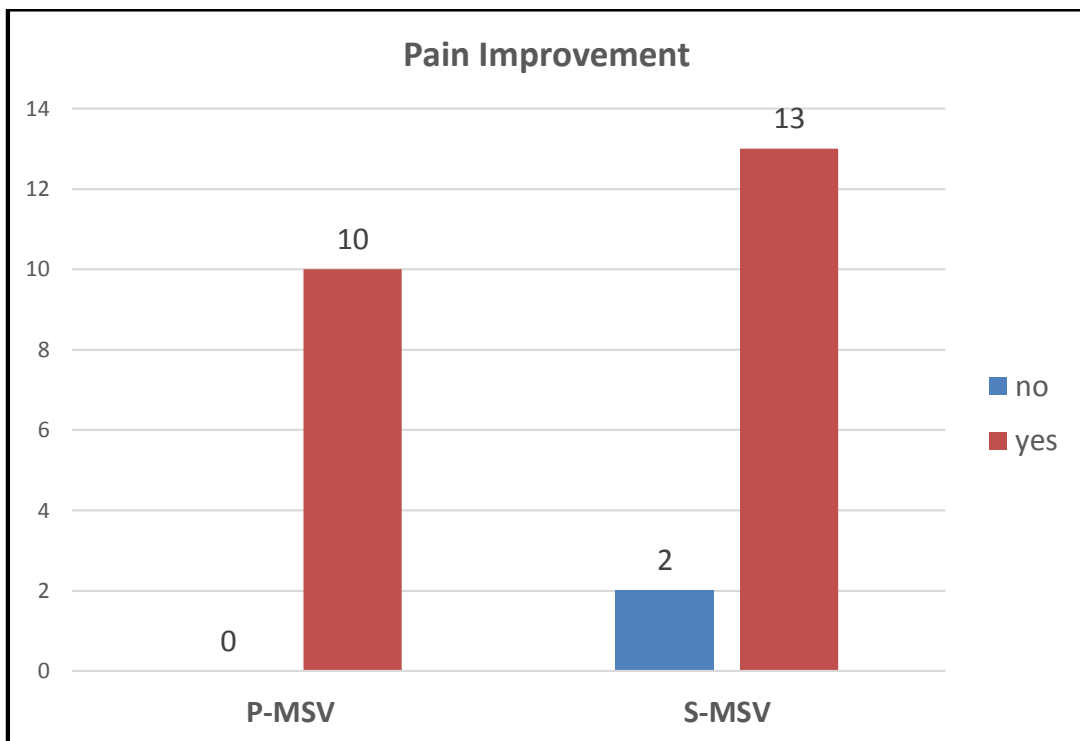


Figure (1) pain improvement after surgery