Does subinguinal varicocelectomy for patients complaining of orchialgia affect the normal semen? A randomized clinical trial

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Background
Scrotal pain is a debatable and challenging subject. Several causes are to be blamed. Varicocele is one of the causes. Varicocele may be presented in many patients, up to 10%, with pain and discomfort, leading to unacceptable lifestyle limitation. Various treatment options for painful varicocele are present, ranging from conservative measures to surgical. Postoperative outcome, for varicocelectomy done for orchialgia, has been addressed very little in the literature, focusing exclusively on pain amelioration. Nearly no study has focused on semen analysis results after the surgery, making choosing surgery the last choice or after extensive exhaustion of other method. So to reduce the stress put upon the surgeon in choosing surgery or not, the authors performed this study to find an answer.

Methods
This study was carried on 16 patients in Assiut University Hospital to identify the effect of subinguinal varicocelectomy for orchialgia on normal semen.

Results
This study showed that it is safe to perform varicocelectomy in case of orchialgia with insignificant effect on semen. Pattern.

Conclusions
The authors recommend the operation for patients complaining of orchialgia with normal semen. This could be explained by the normal preliminary semen and the nature of existing pathology, which did not affect the semen pattern.

Keywords:
orchialgia, varicocele, fertile, novel

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A.A. researched the literature and conceived the study. A.A. was involved in protocol development, gaining ethical approval, patient recruitment, and data analysis. A.A. wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

Introduction

A varicocele is an abnormal dilatation and tortuosity of the pampiniform plexus of veins. It affects men of all ages, affecting nearly 15% of the male population [1]. The varicocele can be presented by infertility. It causes primary infertility in 35% of men, and secondary infertility in 75–81% of men. Chronic testicular pain is a common complaint, affecting up to 2–10% of patients with varicocele. The effect of varicocele on male infertility is well known. However, its contribution to chronic orchialgia is still not well understood. The fertility outcome of surgery has been evaluated by several meta-analyses showing a notable advance in semen parameters postoperatively in subfertile men and favoring microsurgical approaches over other surgical techniques [2]. Treatment for painful varicocele ranges from conservative measures to surgery, if other methods failed. Conservative or nonsurgical methods consist of scrotal support, anti-inflammatory medications, and limitations in activity, leading to unacceptable lifestyle limitation [3].

Microsurgical subinguinal varicocelectomy is the gold standard approach owing to better fertility outcome and less postoperative morbidity [4]. However, such presupposition cannot be made when pain is the studied outcome owing to insufficient prospective randomized controlled trials examining the result of varicocele repair on pain. Most data from the literature are based on retrospective studies, bringing with it some inherent weaknesses [5]. Nevertheless, from the available literature, surgical repair of varicoceles performed for chronic orchialgia results in improvement or resolution of pain in 83–100% of patients. Regardless of the approach,

surgical intervention is effective in most patients with varicocele-related orchialgia [6]. Our aim was to check the safety of the procedure and identify any changes to the normal semen parameters.

Patients and methods

Patients attending the outpatient clinic of Urology Department of Assiut Urology and Nephrology Hospital, Faculty of Medicine, Assiut University, were included. Patient data presenting from August 2018 to February 2020 was collected. Our study had a quasi-experimental study design. The study included all eligible patients (patient having semen count 15 million sperm per milliliter, 39 million sperm per ejaculate, motility more than 40%, and abnormal forms 85%) complaining of pain only and presented to our andrology unit outpatient clinic of Assiut Urology Hospital. Primary varicocele, scrotal pain, patients aged more than 19 years, normal semen analysis (According to the WHO firth guide to semen parameters where sperm concentration equal 15 million per ml, total sperm number 40 million per ejaculate, normal morphology 4%, and motility A = 25% or a + b = 32% is considered normal.) were the inclusion criteria. The scrotal pain must be caused by varicocele only and not by hernia, previous trauma, previous surgery, any congenital epididymal cyst, neglected torsion, tumors of testis, irritable bowel disease, or lower third ureteric stones, and its duration should be more than 3 months. A detailed history taking and a careful examination were done. A visual analog pain score was used to determine the degree of discomfort or pain. Full preoperative investigation was done including, semen analysis and scrotal Doppler. The patient was admitted 1 day preoperatively. A written consent was obtained from those patients who were willing to participate in the study after being mentioned about the risk of the procedure and associated anesthesia. The patients were discharged on the first postoperative day. Analgesia and third-generation cephalosporin were given. Follow-up was scheduled at 3 months postoperatively. A detailed clinical examination was done, including the examination of the wound and degree of varicocele. Semen analysis and testicular Doppler ultrasonography was done 3, 6, and 9 months after surgery. A detailed discussion was carried out, asking about the pain preoperative and postoperative and its relation to daily activity with also the use of analgesics. Correlation between preoperative and postoperative semen analysis for sperm concentration, motility, and abnormal forms was done. Evaluation for complications such as recurrence, persistence of pain, and hydrocele was carried out. The same surgeon performed all the operations.

The study was approved by the Medical Ethics Committee, Faculty of Medicine, with IRB NO.17100681, and was registered on CLINICALTRIAL.GOV: study no. NCT03835143.

Results

Demographic data

We performed subinguinal varicocelectomy for 20 patients who presented to our outpatient andrology clinic in Assiut Urology Hospital from August 2018 to February 2020 complaining of pain, although having normal semen pattern. Four patients were lost to follow-up, hence the data are presented for the rest of 16 patients. Their mean age was 29.56 ± 5.99 (20.0–40.0) years. None of them were hypertensive or diabetic, and only six of them were smokers.

Clinical data

Pain

All patients showed significant improvement of pain using the visual analog scale for pain, as seen in Table 1.

Grades of varicocele

As is clear in Table 2, all patients having preoperative grade I varicocele had no postoperative varicocele, whereas patients having preoperative grade II and grade III varicocele might have had no postoperative varicocele, and their varicocele grade decreased or remain as it is.

Table 1 Comparison between preoperative and postoperative pain using visual analog scale

VAS	Preoperative	Postoperative	*P*
Mean±SD	7.10±1.29	1.95±0.83	<0.001*

VAS, visual analog scale. *Significant difference.

Table 2 Comparison between preoperative and postoperative grade of varicocele

Preoperative	Total	Postoperative varicocele [*n* (%)]			*P*
		No	Grade I	Grade II	
Grade I	3	3 (100.0)	0	0	0.113
Grade II	8	3 (37.5)	4 (50.0)	1 (12.5)	
Grade III	5	3 (60.0)	0	2 (40.0)	
Total	16	9 (56.3)	4 (25.0)	3 (18.8)	

Table 3 Comparison between preoperative and postoperative findings of color flow Doppler scrotal ultrasound

Parameters	Preoperative	Postoperative	*P*
Vein size (mm) Mean±SD	3.77±1.03	2.44±0.99	0.002*
Reflux			
No	0	9	0.001*
Yes	16	7	

*Significant difference.

Scrotal color flow Doppler ultrasound

(1) The vein size preoperatively and postoperatively: we observed the diameter of spermatic veins of varicocele by color flow Doppler ultrasound and measured the largest vein diameter and registered for comparison. Table 3 shows the obtained preoperative and postoperative data. There was a significant reduction in size of vein, with *P* value less than 0.001.
(2) The presence of reflux: when applied the color flow Doppler, we found all patients showed reflux of venous flow during Valsalva preoperatively. After subinguinal varicocelectomy, only seven patients had postoperative reflux, as shown in Table 3. There was a statistically significant difference concerning the presence of reflux, with *P* value less than 0.001.

Semen parameter

As shown in Table 4:

(1) Total sperm number: there was an increase in the total number, as shown in Table 4. There was no statistically significant improvement between preoperative total sperm number and postoperative total sperm number.
(2) Sperm concentration: there was a postoperative increase in the sperm concentration as shown in Table 4; this improvement was not statistically significant.
(3) Sperm motility: we took into consideration both type A and type B motility and their sum, as shown in Table 4. There was a reduction in type A motility and the sum of A and B motility, but of no statistical significance. On the contrary, an increase in type B motility was noticed but also was of no statistically significant.
(4) Sperm morphology: there was no statistically significant difference between preoperative and postoperative sperm morphology.

As shown in Table 4, it is clear that all semen parameters showed no statistically significant difference postoperatively.

Relation between postoperative visual analog scale and reflux

From Table 5, it is visible that there was no significant difference in postoperative pain score between patients having postoperative reflux and those having no postoperative reflux.

No complications were found.

Discussion

In our study, 20 patients were included. Our patients were completely healthy males, six patients were smoker (30%), and 13 were married (65%). Four of them were lost to follow-up. The following data are based on the remaining 16 patients. Our sample size is low for several reason: first, the scarceness of patients, and second, not all of them agreed to have the operation.

The mean age of the patients was 29 years old, which is near to some studies investigating the effect of subinguinal varicocele ligation such as Peterson *et al*. [3] and Abd Ellatif *et al*. [7].

Our patients showed significant improvement in pain according to the visual analog score. The rate of success was 100%. Our result is in agreement with several authors [2,5,8].

Concerning postoperative grade of varicocele, all patients having grade I varicocele preoperatively had complete resolution of their varicocele postoperative. On the contrary, patients having grades II and III varicocele preoperatively might have complete or partial resolution of their varicocele or even show no improvement of their condition at three months postoperatively, and these results are in agreement with several authors [6,9].

The average preoperative internal spermatic vein size was 3.7 mm and postoperatively was found to be 2.4 mm, which was significantly reduced, in addition to absence of reflux in 56.3% of patients. According to Karademir *et al*. [10], color flow Doppler scrotal ultrasound (CFDSUS) was used only in cases of persistent pain; they did not clarify the accurate number of patients showing reflux. Several investigators did not apply the CFDSUS [3,11]. According to Krishna *et al*. [8] and Maghraby *et al*. [12], CFDSUS was done to evaluate testicular size, to assess arterial supply of

Table 4 Comparison between preoperative and postoperative semen parameters

	Preoperative (mean±SD)	Postoperative (mean±SD)	*P*
Total sperm number (million/ejaculate)	187.31±185.41	221.69±170.28	0.313
Concentration (million/ml)	52.34±52.10	68.75±57.72	0.352
Motility A	18.56±13.72	11.94±9.46	0.163
Motility B	30.20±13.05	34.69±10.40	0.186
Motility A + B	52.38±12.14	46.63±14.22	0.233
Morphology	44.37±20.88	45.60±26.12	0.753

Table 5 Relation between postoperative VAS and reflux

VAS	Reflux (*n*=7)	No reflux (*n*=9)	*P*
Median (range)	2.0 (1.0-4.0)	2.0 (1.0-3.0)	0.860

VAS, visual analog scale.

the testis to rule out testicular atrophy postoperatively, and to measure the response to treatment. According to Chawla *et al.* [13], they did not use the CFDSUS, except when it was clinically indicated.

We did postoperative CFDSUS for all patients to evaluate the success of operation, to assess the testicular size to rule out testicular atrophy, and to examine the relation between postoperative success of varicocele ligation and the resolution or persistence of testicular pain postoperatively.

It was reported that varicocelectomy significantly improves semen parameters in infertile men with varicocele. Sperm concentration and motility were the most common parameters to be significantly improved after varicocelectomy [14]. Reviewing the available literature, varicocele with genuine testicular pain with normal preoperative semen parameter was not previously studied. In the current study, varicocelectomy did not significantly affect semen parameter; in other words, subinguinal varicocele ligation was safe concerning the semen parameters in patients with preoperative normal semen parameters. There was one study done in Qatar 2018 that commented on semen parameters, but it was different than ours, as it was retrospective in its design, and also it gave more attention to the operative details such as the number of veins ligated and its relation to pain. They found a relation between the number of veins ligated intraoperatively and motility improvement [2].

Concerning the relation between postoperative resolution and persistence of varicocele versus testicular pain, we found that pain underwent marked improvement irrespective of the success of varicocele ligation. This result is in accordance with Yaman and colleagues, who stated that there is no relation between the reflux and pain [3,15].

Advantages of our study are that it is prospective, and also to our knowledge, the study of the effect of varicocelectomy on patients with normal semen is a novel idea.

Limitations

Our study has some limitations: this study was based on a small number of patients, there was no control group, and it had a relatively short duration of follow-up.

Conclusion

It is safe to perform varicocele ligation for patients complaining of orchialgia with normal semen with improvement of pain and no change in semen parameters.

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Conflicts of interest

There are no conflicts of interest.

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