

## Results of Laparoscopic Varicocelectomy

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### ABSTRACT

**Background:** varicoceles are one of the most commonly identified scrotal diseases. their prevalence in the normal adult male population is 15-20% & they are thought to be the most common treatable cause of male factor infertility. a variety of surgical & non-surgical approaches have been advocated for varicocelectomy. **objective:** to make a follow-up for the results of laparoscopic varicocelectomy after 3 & 6 months. **Patients and methods:** a total of twenty male patients, presented with history of primary infertility or pain or both and have varicocele (30% left-sided & 70% bilateral), were included in the study. laparoscopic varicocelectomy was done between march 2016 and december 2017. we made a follow-up after 3 & 6 months by clinical examination, semen analysis & colored-doppler ultrasonography. **Results:** mean operation time was 40 min. (range 22-58 min.). the hospital stay was one day for all patients. return to normal activities was from 2-3 days. 25% of patients have postoperative scrotal emphysema. 20% of patients had recurrence & 10% had hydrocele. there was no postoperative testicular atrophy in any of the patients. during the follow-up period (6 months), there was improvement in the seminal fluid parameters in 85% of patients. **Conclusion:** although sooner return to work, less postoperative pain, more accessibility to both sides from small incisions are achieved by laparoscopic varicocelectomy, recurrence & hydrocele are more frequent than with the open method.

**Keywords:** hydrocele, laparoscopy, male infertility, recurrence, varicocele

### INTRODUCTION

Varicocele is an abnormal enlargement or dilatation of the internal spermatic vein and the pampiniform venous plexus of the testis due to the inversion of venous blood flow within the spermatic cord <sup>(1)</sup>. It affects approximately 15-20% of the normal adult population. Its prevalence among men with 1<sup>st</sup> male factor infertility is approximately 35%, while 70-85% of men with 2<sup>nd</sup> Infertility present with this condition <sup>(2)</sup>. Although varicocele –associated infertility is not fully understood, impaired semen analysis in varicocele patients and its improvement after varicocelectomy are two major evidences that varicocele has a direct impact on male fertility <sup>(3)</sup>.

With the advent of modern endoscopic surgery, the technique of laparoscopic varicocelectomy has progressively improved <sup>(4)</sup>. To establish the complications and failure rates, we analyzed the laparoscopic results of 20 patients who underwent this procedure to repair varicocele after 3&6 months.

### PATIENTS AND METHODS

A total of 20 male patients with 1<sup>st</sup> varicocele were included in this descriptive study from Al-Azhar University Hospitals and Minia Health Insurance Hospital. 30% of them had left-sided varicocele & 70% had bilateral varicocele. Their ages ranged between 18 & 36 years (mean 25). 50% of patients were complaining of pain, 15% of them were complaining of 1<sup>st</sup> infertility while 35% were complaining of both. Clinically, 75% of patients had

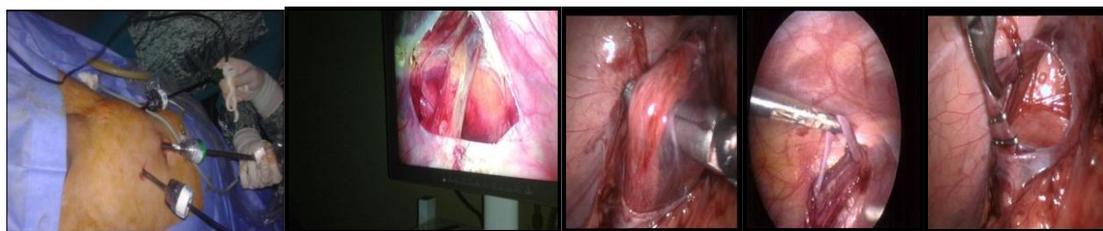
grade II varicocele while 25% had grade III varicocele. Radiologically, all the patients had grade III varicocele. Semen analysis was normal in 30% of patients while it showed stress-pattern in 70% of patients. Any patient having 2<sup>nd</sup> varicocele, other testicular problems as inguinal hernia, hydrocele or testicular tumors or atrophy, previous testicular or inguinal operations or major abdominal surgery was excluded from this study. Investigations for diagnosis as colored-Doppler ultrasonography, semen analysis, hormonal assay were done. Also CBC, prothrombin time, concentration, ECG & abdominal ultrasonography were done for preoperative fitness. The indications for varicocelectomy were 1<sup>st</sup>, 2<sup>nd</sup> infertility and pain.

### Ethical Issues

Informed consents were taken from all of the patients included in our study. **The study was approved by the Ethics Board of Al-Azhar University.**

### Surgical Technique

All the patients included in this study underwent laparoscopic varicocelectomy under general anesthesia. The patient was placed in Supine and slight Trendelenburg for laparoscopic entry. Bladder emptying before abdominal entry was done (have the patient void just before induction to avoid the need for urethral catheterization).



**Figure (1): Trocar lacement for bilateral varicocele, Figure (2): After incision of the peritoneum, Figure (3,4,5): Dissection&clipping of veins**

For left-sided varicocele, 5 mm supra-umbilical trocar for camera and insufflation, 5 mm trocar half-way to two-thirds between the umbilicus and pubic symphysis in the midline, 5 mm trocar on ipsilateral side of the varicocele, lateral to the epigastric vessels around the line of the umbilicus were placed. For bilateral varicocele (**Figure 1**), Supra-umbilical and midline trocars were unchanged, lateral trocar was on ipsilateral side of first approached varicocele, for contralateral side, remained with only three port sites but with the option of moving the camera to the lateral port and using the two midline ports as the working ports. Intrascrotal spermatic cord was pulled on to delineate internal spermatic cord and associated nearby veins and identify vas deferens (internal ring identification). The peritoneum was grasped 5 cm proximal to the internal ring. The posterior peritoneum was incised at this location just lateral and anterior to the spermatic cord by monopolar diathermy (**Figure 2**). The peritoneal window was extended medially and inferiorly. Using Maryland dissector, dissection of veins was done with preservation of internal spermatic artery &

lymphatics, and then clipping of veins was done (**Figure 3, 4, 5**).

Our patients were clinically examined postoperatively for complications & followed-up after 3&6 months by clinical examination, colored-Doppler ultrasonography & semen analysis.

**RESULTS**

All procedures were completed laparoscopically. Operative time ranged between 22-58 min. with mean time 40.10±10.21. There were postoperative complications in 25% of patients in the form of scrotal emphysema. The hospital stay was only one day for all patients. The time to return to normal activities ranged from 2-3 days with mean time 2.35±0.49. Follow-up of our patients after 3months (**Table 1**) revealed that 20% of them had recurrence, 10% had hydrocele & 70% had no complications. Semen analysis was normal in 30% while it showed stress-pattern in 70%. Duplex was normal in 80% of them, but it showed recurrence in 20% (15% had grade II & 5% had grade III).

**Table (1): Follow-up after 3 months**

Follow-up after 3 months		No. = 20	
Complications	No	14	70.0%
	Recurrence	4	20.0%
	Hydrocele	2	10.0%
Semen analysis	Normal	6	30.0%
	Stress-pattern semen	14	70.0%
Duplex	Normal	16	80.0%
	II	3	15.0%
	III	1	5.0%

**Table (2): Follow-up after 6 months**

Follow-up after 6 months		No. = 20	
Complications	No	14	70.0%
	Recurrence	4	20.0%
	Hydrocele	2	10.0%
Semen analysis	Normal	17	85.0%
	Stress-pattern semen	3	15.0%
Duplex	Normal	16	80.0%
	II	3	15.0%
	III	1	5.0%

Follow-up of our patients after 6 months (**Table 2**) revealed that 20% of them had recurrence, 10% had hydrocele & 70% had no complications. Semen analysis was normal in 85% while it showed stress-pattern in 15%. Duplex was normal in 80% of them, but it showed recurrence in 20% (15% had grade II & 5% had grade III).

## DISCUSSION

The laparoscopic approach to varicocele ligation has gained favor for bilateral varicoceles. The built-in magnification of the laparoscope facilitates identification of the spermatic veins and artery, potentially reducing the risk of recurrence of the varicocele and of ischemic damage to the testis. Magnification also allows the surgeon to preserve lymphatics and the genital branches of the genitofemoral nerve that runs along the spermatic vessels, which may reduce lymphocele formation and postoperative pain. Laparoscopic management of varicoceles in adults may reflect the excellent visibility of the posterior abdominal wall achieved using the laparoscope, which allows a thorough search of sites known to be responsible for recurrent varicoceles, namely renal, vas associated, pelvic, and retropubic cross-over veins<sup>(5)</sup>.

Experienced laparoscopic surgeons report a success rate in adults of 93% to 100%, a varicocele recurrence rate of 2% to 10%, and a hydrocele formation rate of zero to 7% leading some medical centers to employ laparoscopy when intervention is indicated<sup>(6)</sup>.

Varicocele recurrence is a major complication of laparoscopic varicocelectomy. Beck *et al.*<sup>(7)</sup> suggested that unligated small internal spermatic veins may be a cause of varicocele recurrence. Rothman *et al.*<sup>(8)</sup> also concluded that recurrences are due to either recollateralization or failure to ligate all branches of the venous plexus. Keys *et al.*<sup>(9)</sup> had a recurrence rate of 8.3%. McManus *et al.*<sup>(10)</sup> had none. Méndez-Gallart *et al.*<sup>(11)</sup> showed that recurrence rates and complication rate of laparoscopic varicocelectomy are similar to those reported with open surgery.

Al-Kandari and *colleagues*<sup>(12)</sup> studied 120 patients with 147 varicocelectomies in three different methods. The recurrence rate was 2% (1 patient) with microscopic sub inguinal varicocelectomy and 13% (7 patients) and 18% (9 patients) with open inguinal and laparoscopic methods, respectively. This report was statistically significant in favor of microscopic sub inguinal varicocelectomy. Al-Said and *coworkers*<sup>(13)</sup> observed the same results (the recurrence rate was

2.6%, 11%, and 17% in microsurgical, open, and laparoscopic groups, respectively). Watanabe and *colleagues*<sup>(14)</sup> reported 6.1% recurrence in 33 patients with bilateral laparoscopic varicocelectomy. Varicocele recurrence after laparoscopic method was reported to be 8.9%, but stood at 6.7% when the lymphatic vessels were preserved<sup>(15)</sup>. Recurrence rate in our study was 20% (4 cases).

Hydrocele formation is another common complication after laparoscopic varicocelectomy & is related to failure to preserve the lymphatic vessels associated with the spermatic cord. Franco suggests complication rates are relatively low for laparoscopic varicocelectomy except for the hydrocele rate, which has been similar to that encountered with the open Palomo approach in case of adolescent male<sup>(5)</sup>. Kocvara and *coworkers*<sup>(15)</sup> had a hydrocele rate of 0.3% to 40.4%. Keys *et al.*<sup>(9)</sup> had a hydrocele rate of 12.5%, Pini Prato *et al.*<sup>(16)</sup> 12% and Méndez-Gallart *et al.*<sup>(11)</sup> 13.5% using laparoscopic mass ligation varicocelectomy. In several studies, hydrocele after varicocelectomy has been reported in 3% of cases in expert hands<sup>(17)</sup>. Kocvara and *colleagues*<sup>(15)</sup> reported hydrocele formation 17.9% with conventional laparoscopic varicocelectomy and 1.9% with their own method (preservation of lymphatic vessels). In the study of Al-Kandari and *associates*<sup>(12)</sup>, hydrocele formation was 20% in the laparoscopic group, according to Al-Said and *colleagues*<sup>(13)</sup>, hydrocele formation was 5.4% in the laparoscopic group. However, there appears to be a statistically significant decrease in hydroceles when the internal spermatic vessels are simply ligated rather than ligated and divided<sup>(18)</sup>.

In our study, we had hydrocele formation in 2 patients (10%); this relatively low incidence may be related to meticulous dissection of the gonadal vessels from the adjacent lymphatic vessels.

Al Bakri *et al.*<sup>(19)</sup> reported that the sperm quality improves by 3 months after varicocelectomy and then does not improve further. Although the percentage of improvement of seminal fluid parameters was very promising (85%) at 6 months period in our study, the exact spontaneous pregnancy rate was difficult to be estimated as most of our patients was not compliant with next visit when pregnancy achieved.

## CONCLUSION

Our study demonstrated that although sooner return to work, less postoperative pain, more accessibility to both sides from small incisions are achieved by laparoscopic varicocelectomy,

complications of this method ( varicocele recurrence & hydrocele) are more frequent than the open method.

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