



ORIGINAL ARTICLE

RESULTS OF VARICOCELE SURGERY: A COMPARISON OF LAPAROSCOPIC AND CONVENTIONAL OPEN HIGH LIGATION

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Abstract

Aim: Varicocele is the most frequently observed surgically correctable cause of male infertility. We aim at to evaluate the advantages and the shortcomings of laparoscopic and conventional open high ligation of varicocele.

Methods: a total of 110 patients were operated on for varicocele to evaluate the clinical efficacy of the treatment, the patients were divided into two groups, open varicocelectomy was performed on 50 patients (group 1) and laparoscopic varicocelectomy was performed on 60 patients (group 2). In both groups, the operations were performed by Palomo,s technique by ligation of the vein in the retroperitoneum above the internal ring with the preservation of the artery .

Results: The mean hospital stay in open varicocelectomy was longer than in laparoscopic group (with average 3 days and 1.5 days, respectively). Also, patients of laparoscopic varicocelectomy returned earlier to their normal activities (with average 9days and 4.5 days, respectively). Recurrence rates were 6% and 3.3% respectively, postoperative hydrocele occurrence was 4% and 1.7% respectively, wound complication was 6% versus 1.7% and scrotal edema was 8% versus 1.7% in laparoscopic group. Also postoperative pain was less in laparoscopic group. Seminal analysis improved in both groups.

Conclusion: Compared to open varicocelectomy, laparoscopic varicocelectomy had shorter convalescence, early return to normal activities and less postoperative morbidity.

Keywords: Laparoscopic surgery, Palomo , varicocele, testicle.

INTRODUCTION

Varicocele can be defined as an abnormal tortuosity and dilation of the veins of the pampiniform plexus. Idiopathic varicocele is usually asymptomatic. It is noticed as an asymmetry in scrotal size and presents as heaviness in the scrotum, or rarely, with testicular pain. In most cases, the adolescent is unaware of the varicocele.⁽¹⁾ The incidence of varicocele is 15% in normal population,⁽²⁾ however it has a prevalence of 34-40% in infertile male.^(3,4)

Varicocele is associated with a time-dependant growth

arrest in adolescents and adult males.⁽⁵⁾ There is a clear association between varicocele, infertility, and testicular growth arrest.⁽⁶⁾ It is also known that varicocelectomy can reverse growth arrest in adolescents.⁽⁷⁾

Surgery is indicated in cases of scrotal discomfort, pain or subfertility and several methods for occluding the internal spermatic vein have been developed. Of the three main surgical approaches, i.e. scrotal, inguinal, and high retroperitoneal, the latter two are used most widely.⁽⁸⁾ Non- surgical techniques such as percutaneous embolization by balloon, coils or

autologous clot, sclerosing agents and thermal destruction have significant failure and recurrence rates in addition to their potential hazards of vessels perforation and embolus migration.⁽⁹⁾

Since first described by Winfield and colleagues in 1991,⁽¹⁰⁾ laparoscopy has gained popularity, and many surgeons have used this approach for the treatment of varicocele.⁽¹¹⁾

The present study compares the laparoscopic and conventional open high ligation in treatment of varicocele.

PATIENTS AND METHODS

The study included 110 patients randomly divided into Group 1 representing open surgery approach of 50 cases and Group 2 representing laparoscopic approach of 60 cases. All the operations were done in Suez Canal University Hospital from November 2007 to March 2009 by the same surgeon. The trial was approved by the Faculty of Medicine, Suez Canal University Research Ethics Committee, and written informed consent was obtained from all participants prior to entry into the trial. The ages of Group 1 ranged between 12-37 years with an average of 23 years. Those in Group 2 ranged between 13-42 years with an average of 25.5 years. The majority of cases of the school age were discovered accidentally in the routine medical examination. So, there were asymptomatic while patients between 15-27 years complained from testicular pain and or swelling. Subfertility was the main complain of patients above 27 years.

Diagnosis of varicocele was established mainly by clinical examination in upright then supine position and Doppler ultrasound scan to confirm the diagnosis and to assess testicular size pre- and postoperatively.

Varicocele was graded according to Dubin and Amelar:⁽¹²⁾ grade I, vein dilatation palpable during Valsalva maneuver in upright position; grade II, palpable in upright position without Valsalva maneuver; and grade III, palpable and visible dilated veins through scrotal skin in upright position without Valsalva maneuver. Patients with subfertility underwent semen analysis at least twice and checked 6-12 months postoperatively. Examination included sperm count, percentage of sperm motility and presence of abnormal forms.

Operative technique

Laparoscopic varicolectomy: The operation is carried out with general anesthesia. Laparoscopy is performed with 5-mm ports placing an umbilical port for video endoscopy the other two 5-mm ports were placed in the right and left lower quadrant. The patient is placed in Trendelenburg's position at an angle of 15°. The parietal peritoneum overlying the enlarged vessels was divided high above the internal inguinal ring in order to create a

wide window, large enough to reach and mobilize the vessels. The entire vascular pedicle was consecutively mobilized, grasped approximately 3-5 cm above the internal ring ligated, and divided in the middle.

Open Varicolectomy: This procedure is performed under general anesthesia. A left lower quadrant diagonal muscle-splitting incision is made, and a retroperitoneal approach is used to expose the vascular pedicle to the testicle. The veins were separated and doubly ligated with silk ties and divided in the middle.

As follow-up assessment, clinical and color Doppler ultrasound assessments were performed 1, 3, 6, and 12 months postoperatively. Recurrence or persistence of the varicocele, the presence of a hydrocele, and testicular volume were assessed. Data are reported as median and range.

RESULTS

Forty two patients in Group 1 presents with unilateral varicocele while only 8 had bilateral varicocele. Also, in Group 2, fifty patients presented with unilateral varicocele and 10 patients with bilateral disease Table 1.

The presentations and grades of varicocele in both groups are presented in Table 2. In Group 1, the average operative time in unilateral cases was 25.3 minutes and 40.5 minutes in bilateral cases while in Group 2 it was 35.5 minutes in unilateral cases and 45.2 minutes in bilateral cases.

Patients in open varicolectomy stayed in hospital much more than laparoscopic group (with average 3 days versus 1.5 days, respectively). Also, patients carried out laparoscopic varicolectomy return earlier to their normal activities (with average 9days and 4.5 days, respectively).

Postoperative pain was subjectively evaluated, and its intensity was estimated on the basis of the number of narcotic injections administered during the first 24 hours after surgery. While all patients in group 1 required one or more narcotic injections, (71.7%) of patients in group2 did not need narcotic analgesics.

No major surgical complications occurred in either group, other than three patients developed wound infection in Group 1 or one patient in Group 2 and both responded to systemic antibiotics. Scrotal edema occurred in 4 patients in Group 1 (8%) and 1 patient in Group 2 (1.7%) and resolved spontaneously. All patients were regularly followed up for 1, 3, 6, and 12 months postoperatively. Three patients in Group 1 (6%) and 2 patients in Group 2 (3.3%) had recurrence of the disease within 12 months postoperatively. No testicular atrophy was reported in either group during the follow-up period. Semen analysis were done for 25 patients in each group from whom we were able to obtain at least 2 semen samples, 3 or more months post-operatively. Significant improvements were noted in both groups. Table 4.

Table 1. Types of varicocele.

Type	Group 1 Open varicocelectomy (n=50)	Group 2 Lap varicocelectomy (n=60)
Left- sided varicocele	42(84%)	50(83.3%)
Bilateral varicocele	8(16%)	10(16.7%)

Table 2. Symptoms and grades of varicocele.

	Group 1 Open varicocelectomy (n=50)	Group 2 Lap varicocelectomy (n=60)
Symptoms		
9-15years: Asymptomatic	5 (10%)	15 (25%)
15-27 years: Testicular pain&/or swelling	20 (40%)	20 (33.3%)
>27years: Subfertility	25 (50%)	25 (41.6%)
Grades:		
I	5 (10%)	2 (3.4%)
II	35 (70%)	40 (66.6%)
III	10 (20%)	18 (30%)

Table 3. Operative time and post-operative complications.

	Group 1 Open varicocelectomy (n=50)	Group 2 Lap varicocelectomy (n=60)
Average operative time		
Unilateral	25.3min	35.5min
Bilateral	40.5min	45.5min
Post-operative complications		
Postoperative pain		
• No narcotic inject	0	43 (71.7%)
• 1 injection	31 (62%)	14 (23.3%)
• 2injection	15 (30%)	3 (5%)
• 2 injections	4 (8%)	0
Wound infection	3 (6%)	1 (1.7%)
Scrotal edema	4 (8%)	1 (1.7%)
Recurrent varicocele	3 (6%)	2 (3.3%)
Hydrocele	2 (4%)	1 (1.7%)

Table 4. Semen characteristics per group.

Varicocelectomy	Before treatment	After treatment	P
Open			
Sperm count, × 10%	23 ± 12	59 ± 20	.025
Sperm motility, %	39 ± 18	75 ± 22	.031
Sperm morphology	31 ± 19	45 ± 26	.017
Laparoscopy			
Sperm count, × 10%	33 ± 17	65 ± 31	.059
Sperm motility, %	35 ± 22	44 ± 16	.083
Sperm morphology	37 ± 19	49 ± 23	.022

DISCUSSION

The sole indication for surgery in the present study was the presence of varicocele, even when asymptomatic. This was based on the concept that early correction of varicocele will alter not only the progressive decline in fertility but also will prevent future infertility in younger male patients.⁽¹²⁾ The average operative time of laparoscopic varicocelectomy in the present series was 35.5 minutes in unilateral cases and 45.2 minutes in bilateral cases while it was 25.3 minutes in unilateral cases and 40.5 minutes in bilateral cases of open varicocelectomy group. Mohamed and Yasser⁽¹⁴⁾ showed almost near results in operative time of laparoscopic varicocelectomy with 26 ± 3 in unilateral cases and 33 ± 2 in bilateral cases. However, they reported much longer time in open varicocelectomy with 59 ± 7 minutes in unilateral cases and 79 ± 9 minutes in bilateral cases. Ulker et al⁽⁹⁾ reported average time of 19.1 and 38 minutes (unilateral and bilateral cases, respectively). Bebars et al⁽¹³⁾ reported that familiarity with performing more cases had decreased operative time in laparoscopic varicocelectomy with 69.8 minutes in unilateral cases that became 42.3 minutes and 92.5 minutes in bilateral cases that changed into 71.8 minutes.

Although laparoscopic varicocelectomy has been performed by many surgeons on a 1day- surgery basis, the mean hospital stay in this series was 3 days in open group and 1.5 days in laparoscopic group matching results of Bebars et al,⁽¹³⁾ However, Ulker et al⁽⁹⁾ reported shorter hospital stay in open group with only one day compared to 1.4 days in laparoscopic group but in Mohamed and Yasser⁽¹⁴⁾ report, it was 1.1 ± 0.5 days for laparoscopic group and 1.8 ± 0.7 days for open one.

Patients in open group of this series returned to normal daily activities in 9 days compared to 4.5 days in laparoscopic group similar to results of Bebars et al.⁽¹³⁾

Wound infection occurred in 3 patients of open group

and 1 patient of laparoscopic group and all responded to antibiotics. Bebars et al⁽¹³⁾ reported occurrence of wound infection in one case of each group and also responded to antibiotics. Recurrent varicocele occurred in 3 patient of open group and 2 patients on laparoscopic one while Bebars et al⁽¹³⁾ reported 7 patients in open group and 5 in laparoscopic group. Mohamed and Yasser⁽¹⁴⁾ reported that none of patients underwent laparoscopic varicocelectomy developed recurrence.

Although the patient groups are not large, the two methods seemed equally effective to improve semen parameters following the operation. However larger groups are necessary to evaluate the effectiveness of the two methods more accurately.

In conclusion, Laparoscopic varicocelectomy is a minimally invasive procedure that is easy to perform with simple instruments. The clear visualization and magnification provide control of the affected vessels thus decreasing incidence of postoperative recurrence. Compared to open varicocelectomy, laparoscopic varicocelectomy had shorter convalescence, early return to normal activities and less operative morbidity. Therefore, we recommend that laparoscopic technique for varicocele ligation replace the conventional open method.

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