

Comparison of Outcome in Open and Laparoscopic Varicocelectomy

Abdullah Bin Saeed, Shoukat Ali, Muhammad Murtaza, Javed Iqbal

ABSTRACT

Varicocele is defined as excessive dilatation of the pampiniform venous plexus of the spermatic cord. Several methods have been used for its treatment including open surgical ligation of the spermatic vein as well as laparoscopic and microsurgical varicocelectomy. Open varicocelectomy has more risk of complications. Laparoscopic varicocelectomy is simple, easily mastered and has less risk of complications. Moreover, laparoscopic approach is better than open approach in treating bilateral varicocele. Laparoscopic varicocelectomy may be suggested to be used more often in future if the results of this study show relative benefits. **Objective:** To compare laparoscopic varicocelectomy with open varicocelectomy in patients with varicocele in terms of mean operative time and frequency of wound infection. **Study Design:** Randomized clinical trial. **Setting:** Punjab Medical College and affiliated hospitals **Period:** Study was carried out for one year from 27-9-2013 to 26-09-2014 **Methodology:** A total of 164 patients of varicocele were included in the study. All patients were diagnosed clinically as having varicocele. 82 patients underwent laparoscopic varicocelectomy (group A) and 82 open varicocelectomy (group B). Outcome in terms of operative time and wound infection was compared in both groups. **Results:** Mean age in group A was 30.55 years with a standard deviation of 8.87. Mean age of patients in group B was 30.56 years with a standard deviation of 8.08. Wound infection in group A was 11% and 34.1% in group B. P value was 0.0001. Operative time in group A was 27.44 \pm 3.31(min) and 36.79 \pm 3.49(min) in group B. P-value was 0.0001. **Conclusion:** Outcome of laparoscopic varicocelectomy is better than open varicocelectomy in patients of varicocele.

Keywords: MeSH. Laparoscopic varicocelectomy, outcome, varicocele.

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INTRODUCTION

A varicocele is a dilatation of the pampiniform venous plexus within the scrotum. It occurs in approximately 15%-20% of all males and in 40% of infertile males. The mechanism by which varicocele exerts a deleterious effect on testicular function and semen quality remains unknown. It has two types: primary and secondary.

The ideal varicocele treatment should be safe, effective, and minimally invasive. Treatment of varicocele is still controversial. Several methods have been used including open surgical ligation of the spermatic vein as well as laparoscopic and microsurgical varicocelectomy. Each technique has advantages and disadvantages and conflicting results have been obtained by different studies.^{1,2}

Laparoscopic varicocelectomy is a commonly performed procedure and it is done under general anesthesia. It is curative in majority of patients. It involves clipping and division of testicular veins before these enter the deep inguinal ring.

Laparoscopic varicocelectomy has the advantage of very low incidence of significant complications.³

Open Varicocelectomy i.e High Ligation is done under spinal or general anesthesia. It is commonly done in centers where either laparoscopy or expertise for it are not available. It has more risk of complications.⁴

The laparoscopic technique has several advantages over the open retroperitoneal approach. It is simple, shortens the operative time and hospital stay and results in reduced postoperative pain which requires less injectable narcotic analgesia. It also has a low incidence of varicocele recurrence and minimal residual scarring. Furthermore, laparoscopic varicocelectomy is easily mastered; does not require microsurgical skills and provides better magnification of the vascular structures which is helpful in preserving the testicular artery. Laparoscopic technique is safe even after prior inguinal surgery. Supra-inguinal access allows ligation of fewer veins compared to

labour-intensive sub-inguinal approach. In case of bilateral varicocele, it avoids additional incision with its attendant effects.⁵

Patients of varicocele who are treated with Laparoscopy, mean operative time is 41.12 +/- 6.46(min) and they have 1.96% wound infection while patients treated with open method have operative time 59.86 +/- 8.45(min) and wound infection of 11.76%.⁶

This study is meant to compare the outcome of the two therapeutic options in second and third grade varicocele because varicocele affects adult males and in half of them is the cause of infertility. There are very few studies done regarding the comparison of the two options in second and third grade varicocele and available studies show conflicting results^{5,6,7}. Diegidio et al.(2011) showed that frequency of wound infection is 2.3% in laparoscopic technique and 4.2% in open technique while operative time was 30 +/- 5.46(min) with laparoscopic technique and 26 +/- 7.24(min) in open technique.⁵ Al-Said et al.(2008) showed frequency of wound infection of 0.8% and operative time of 34 +/- 2.2(min) in laparoscopic technique while with open technique both were 1.4% and 38 +/- 3.5(min) respectively.⁶ Sangrasi et al.(2010) showed operative time of 43.8 +/- 8.95(min) laparoscopic technique and 34.8 +/- 7.89(min) in open technique and it showed no difference in frequency of wound infection in both techniques.⁷ Laparoscopic varicolectomy for grade 2 and 3 varicocele may be suggested to be used more often in future if the results of this study show relative benefits.

METHODOLOGY

Study Design: Randomized clinical trials.

Setting: Punjab Medical College and Affiliated Hospitals, Faisalabad.

Period: 1 year from 27-9-2013 to 26-09-2014.

Sample size: By using WHO sample size calculator for two proportions Wound infection in laparoscopic group =1.96 %⁶ Wound infection in open group =11.76%⁶ Power of study =80% Level of significance =5% Sample size =164 (82 in each group).

Sampling Technique: Non probability Consecutive sampling Technique.

Inclusion Criteria: Patients between 15-60 years of age (because varicocele is uncommon before 15 years and after 60 years) diagnosed clinically as having varicocele (unilateral or bilateral) on the basis of following criteria;1-Grade 2 and Grade 3 varicocele (Diagnosed clinically).2-Symptoms of pelvic heaviness and dragging sensation in the scrotum (diagnosed clinically).

Exclusion Criteria: 1-Grade 0 and Grade 1 varicocele (grade 0 diagnosed with doppler and grade 1 diagnosed clinically) as this can be managed conservatively.2-Presence of concurrent painful scrotal conditions e.g. orchitis, epididymo-orchitis and trauma (diagnosed clinically) Above conditions may act as confounders and if included in the study may produce bias in the results. After approval from the Hospital Ethical Committee, patients between 15-60 years of age were included in the study on the basis of inclusion criteria. They were admitted through outpatient department. Informed consent was taken and they were randomly allocated into either laparoscopic or open varicolectomy groups by using computer generated random number tables. Consultant surgeons performed the procedures. Variables (operative time and wound infection) were recorded in protocol proforma by trainee researcher. Data was analysed on the basis of variables of the study using SPSS version 22

RESULTS

164 patients (82 in each group) were taken during the study period of one year from 27-09-2013 to 26-09-2014. Minimum age was 15 years and maximum age was 51 years with a mean of 30.55 years and standard deviation of 8.46. Mean age in group A was 30.55 years with a standard deviation of 8.87. Mean age of patients in group B was 30.56 years with a standard deviation of 8.08.94% of patients in both groups were between 15-45 years and 6 % of patients in both groups were between 46-60 years.9 patients in group A were having wound infection (11%) and 28 patients were having wound infection in group B (34. 1%).There was statistically significant difference between the two with P value of 0.0001. (Table 1)

Table 1: Frequency of wound infection between two groups

Wound Infection	Group A	Group B	Total
Yes	9 11.0%	28 34.1%	37 22.6%
No	73 89.0%	54 65.9%	127 77.4%
Total	82	82	164

Chi-square value = 12.599, p-value = 0.0001

Operative time in group A was 27.44 +/- 3.31(min) and 36.79 +/- 3.49(min) in group B. There was statistically significant difference between the two with P value of 0.0001. (Table 2)

Table 2: Comparison of operative time between two groups

Variable	Group A	Group B	p-value
Operative time	27.44 ± 3.31	36.79 ± 3.49	0.0001

Wound infection in age group 15-30 years was 14.3% in laparoscopic group and 34.3% in open group with P-value of 0.039. In age group 31-45, wound infection was 6.1% in laparoscopic group and 34.1% in open group with a statistically significant P-value of 0.003. In age group 46-60 years, it was 14.3% in laparoscopic group and 33.3% in open group with P-value of 0.49. (Table 3)

Table 3: Frequency of wound infection in both groups according to age distribution

Age distribution	Wound infection	Group		Total	p-value
		Group A	Group B		
15-30 years	Yes	6 (14.3%)	12 (34.3%)	18 (23.4%)	0.039
	No	36 (85.7%)	23 (65.7%)	59 (76.6%)	
31-45 years	Yes	2 (6.1%)	15 (34.1%)	17 (22.1%)	0.003
	No	31 (93.9%)	29 (65.9%)	60 (77.9%)	
46-60 years	Yes	1 (14.3%)	1 (33.3%)	2 (20%)	0.49
	No	6 (85.7%)	2 (66.7%)	8 (80%)	

Operative time in age group 15-30 years was 26.73±/− 2.99 minutes in laparoscopic group and 36.37 ±/− 3.84 minutes in open group with statistically significant P-value of 0.0001. In age group 31-45 years, it was 27.39±/−3.18 minutes in laparoscopic group and 37.16±/−3.24 minutes in open group with statistically significant P-value of 0.0001. In age group 46-60 years, operative time was 31.86±/−2.61 minutes in laparoscopic group and 36.33±/−3.21 minutes in open group with statistically significant P-value of 0.0001 (Table 4)

Table 4: Comparison of operative time in both groups according to age distribution

Age distribution	Variable	Group		p-value
		Group A	Group B	
15-30 years	Operative time	26.73 ± 2.99	36.37 ± 3.84	0.0001
31-45 years	Operative time	27.39 ± 3.18	37.16 ± 3.24	0.0001
46-60 years	Operative time	31.86 ± 2.61	36.33 ± 3.21	0.047

DISCUSSION

Currently, popular varicocele methods include the Ivanissevich method, Palomo method, subinguinal method, laparoscopic method, and sclerotherapy (internal spermatic vein embolization). Although there have been investigations and reports on various varicocele treatments with regard to outcomes such as complications, recurrence and pregnancy rates, the most effective and least invasive method remains unknown.^{8,9}

Mean age of the patients was 30.55(15-51) years with a standard deviation of 8.46. This study showed that age is not significant factor for outcome of surgery. This fact is supported by different studies.^{8,9}

Al-Hunayan et al (2006) showed comparable results with mean age of 31 Years¹⁰. Simforoosh et al (2007) showed mean age of 27.5(17-39) years in laparoscopic group and 27.5(16-40) years in open laparoscopic group¹¹. MacManus et al. (2004) also showed mean age of 34.1±/−7 years consistent with this study.¹²

Link et al (2006) showed mean age of 14(12-17) years.¹³ Beutner et al (2007) showed mean age of 18.4 years.¹⁴ Spinelle et al (2010) showed mean age of 14.5 years.¹⁵ Roserlu et al (2010) showed mean age of 28.1(18-48) years.¹⁶

This study showed laparoscopic varicocele to be most time-saving procedure. Mean operative time for laparoscopic Group was 27.44 ± 3.31 minutes while mean operative time for open varicocele group was 36.79 ± 3.49 minutes. This short operative time in laparoscopic group is related to increased magnification and easy access to testicular veins by this method.

Al-Hunayan et al. (2006) showed operative time of 21±/−7(min) with laparoscopic varicocele¹⁰. Simforoosh et al (2007) showed operative time of 17.2±/−9.8(min) with laparoscopic varicocele and 31.02±/−12.8(min) with open varicocele¹¹

MacManus et al (2004) showed shorter operative time of 34±/−5(min) with laparoscopic varicocele and longer time of 60±/−9(min) with open technique¹²

Link et al. (2006) showed mean operative time of 53(45-65) minutes.¹³ Beutner et al (2007) showed

operative time of 36.4+/- 10 (min) with laparoscopic technique¹⁴

Sasagawa et al (2000) showed operative time of 35+/-10(min) with laparoscopic technique.¹⁷

Al-Said et al. (2008) also showed shorter operative time of 34+/- 2.2(min) with laparoscopic technique and longer operative time of 38 +/-3.5(min) with open technique. Al-Kandari et al. (2008) showed operative time of 32+/- 13(min) with laparoscopic group and 37+/-10(min) with open technique which are comparable to this study¹⁸

Barroso et al (2009) showed longer operative time of 53.5+/-12.02(min)with laparoscopic technique and a shorter operative time of 30(min) with open technique.¹⁹Gargollo et al (2009) showed shorter operative time of 28+/- (min) with laparoscopic technique²⁰.Nine patients (11%) out of 82 patients developed wound infection in laparoscopic group and 28(34.1%) patients out of 82 developed wound infection in open varicocelectomy group.

Beutner et al (2007) showed 1.6% wound infection in laparoscopic group.¹⁴ Sasagawa et al (2000) showed wound infection of 1 % in laparoscopic varicocelectomy group.¹⁷

Barroso et al (2009) showed wound infection of 2 % in patients of laparoscopic varicocelectomy¹⁹

Koyle et al. (2004) showed wound infection of 1.2% in laparoscopic group and 28% in open group.²¹ In the age group of 46-60 Years, incidence of wound infection was 14.3% in laparoscopic group and 33.3% in open varicocelectomy group. This higher incidence of wound infection in this age group was consistent with other studies (Koyle et al 2004).²¹

Podkamenev et al. (2002) reported a series of 654 patients randomly assigned to laparoscopic and open surgical groups. Both operations utilized the Palomo technique, with preservation of the lymphatics and ligation of the testicular artery and veins above the inguinal canal. In contrast to the previous report, the authors concluded that their laparoscopic approach was similar in regards to recurrence rates and superior in regards to hydrocele formation, scrotal edema, operating time, wound infection and convalescence.²³

Wound infection was 6% that is lower than that of our study and operative time was 30+/-4.42(min) consistent with our findings.

Esposito et al. (2000) published their initial experience with the laparoscopic treatment of pediatric varicoceles in a series of 161 patients. They used a combination of techniques including a 2- or 3-port approach with ligation of both the testicular artery and vein by the Palomo technique or ligation of the veins only by using the Ivanissevitch procedure. These authors also concluded that the

recurrence and complication rates of the laparoscopic approach are comparable to if not better than those of the open or radiological approach.²⁴

Wound infection was 4 % lower than that of our study and operative time was 32.32+/- 3.31(min) consistent with that of our study.

Méndez-Gallart et al. (2009) showed infection rate of 0.6% and operative time of 32+/- 4.41(min). operative time was comparable to our study.²⁵

CONCLUSION

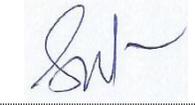
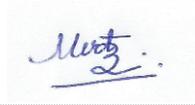
Laparoscopic varicocelectomy has shorter operative time and less frequency of wound infection as compared to open varicocelectomy. Though it is associated with complications, it's benefits outweigh its complications.

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