

## Original Article

# Compare the Outcome of Open Versus Laparoscopic Varicocelectomy

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## ABSTRACT

**Objective:** To compare the outcome of the laparoscopic surgery with open varicocelectomy. It is also assess the operative time, postoperative pain, postoperative recovery of patients and postoperative complications of both procedures such as, bleeding, haematoma, wound infection, hydrocele, laparoscopic related complications and recurrence.

**Study Design:** Observational Study.

**Place and Duration of Study:** This study was carried out in Surgical Unit-IV, Liaquat University Hospital Jamshoro, from January 2009 to December 2010.

**Materials and Methods:** This study consisted of 80 patients of varicocele grade III were admitted and divided in two groups. Group A for open varicocelectomy and group B for laparoscopic varicocelectomy in which each group consist of 40 patients.

**Results:** The ages of patients ranged between 11 years to 50 years. The mean age of LV group was  $25.72 \pm 6.026$  years and for OV group was  $27.58 \pm 6.694$  years. In OV group 92.5% of patients were having left varicocele, 5% right varicocele and 2.5 bilateral disease where as in LV group 90% of cases were having left, 7.5 % right and 2.5% bilateral varicocele. The mean time in OV group was  $29.70 \pm 8.498$  minutes and  $25.08 \pm 5.558$  minutes in LV group ( $p < 0.005$ ). The mild pain was observed in 7 (17.5%) patients of OV group and 16 (40 %) patients of LV group. Whereas, severe pain was described by 10(25%) patients in OV group and 4 (10 %) patients in LV group ( $p < 0.032$ ). The wound infection was found in 6 (15%) patients of OV group and 2 (5%) patients of LV group. The hydrocele was seen in 5(12.5%) cases of OV as compared 2 (5%) cases of LV group. Residual varicocele and recurrence of varicocele was observed in two cases (2.5%) of OV group and 3 cases of LV group with value  $p < 0.359$ . It was longer about 2-3 days in 34 (85%) of OV patients as compared to LV cases where majority 36(90%) were discharged within 1 to 2 days.

**Conclusion:** The results shows that LV is superior than OV in terms of better cosmesis, less operative time, less complications, short hospital stay and early return to work.

**Key Words:** Open Varicocelectomy (OV), Laparoscopic Varicocelectomy (LV), Complications of Varicocelectomy.

## INTRODUCTION

Varicocele is a condition in which the veins of the pampiniform plexus are elongated and dilated. It is a common disorder in adolescents and young adults<sup>1</sup>. This venous plexus bears the name "pampiniforms" because it wraps itself around the spermatic cords like a vine<sup>2</sup>. The incidence of varicocele in the general male population is 9 to 23% and increases to 40% in infertile patients<sup>3</sup>. It mostly occurs on left side 95%, both sides 11% and right side 4%<sup>4</sup>.

Varicosities develop due to mechanical problem in the drainage of the testicular veins primarily due to valvular incompetence at the level where they join with the main venous system on left side in left renal vein and on right side in inferior vena cava<sup>2</sup>. Thus, retrograde flow from any of these venous systems can also result in varicocele formation. Approach and techniques in the surgical treatment has remained debatable among surgeons. In principle, the treatment involves interruption of spermatic venous flow at any site along its course till its distal termination to stop the retrograde venous filling of these vessels. Thus the site of such an

interruption may be scrotum, inguinal canal, low retroperitoneum or high retroperitoneum<sup>5</sup>. In the study of Goulart TD<sup>6</sup>, the inguinal open approach is more ancient and was first described by Ivannisevich in 1918. The main advantages of claimed for retroperitoneal approach are simplicity and avoidance of injury to the testicular artery. Since last ten years minimal access surgical techniques shows significant advantages to open surgery, such as shorter hospitalization, reduced need of analgesic drugs, quick return to daily activities and better cosmetic results. Recently Laparoscopic Varicocelectomy is gaining popularity and is considered to be the treatment of choice in bilateral varicocelectomy<sup>7</sup>.

## MATERIALS AND METHODS

This study was carried out in Surgical Unit-IV Department of surgery, Liaquat University Hospital Jamshoro, from January 2009 to December 2010. 80 patients of varicocele were admitted.

The patients were diagnosed by pre-operative workup and on clinical parameters and doppler ultrasound finding. The patients were divided into two groups, A for open and B for laparoscopic varicocelectomy each comprising of 40 patients. A detailed history and clinical examination, operative findings, postoperative recovery, postoperative complications and follow up record was made on especially designed proforma. Clinical examination of the patient was done with assessment of swelling in scrotum & palpable veins like bag of worms at the bottom of scrotum.

All patients underwent for base line investigations. The patients were consulted about their willingness and written consent before adapting either of the operative method i.e, Laparoscopic or open Varicocelectomy. All 80 patients with symptomatic varicocele or grade –III varicocele or varicocele were Included in the study irrespective of their age. Where as the patients unfit for general anesthesia; patients with grade I varicocele; patients who were asymptomatic having no effect on fertility; and the patients with other associate problems like inguinal hernia, atrophy of testis, orchitis were excluded from study. The follow up comprised mandatory 1st visit after one week for removal of stitches and then monthly assessment for 6 to 12 months in order to assess duration of resumption to normal work, improvement of symptoms, disappearance of varicocity and improvement of fertility.

## RESULTS

There was wide variation of age of patients between both OV and LV groups. The ages of patients ranged between 11 years to 50 years. The mean age of LV group was  $25.72 \pm 6.026$  years and for OV group it was  $27.58 \pm 6.694$  years with  $p = 0.325$  (Table No.1).

In OV group 92.5% of patients were having left varicocele, 5% right varicocele and 2.5 bilateral disease where as in LV group 90% of cases were having left, 7.5 % right and 2.5% bilateral varicocele (Table No.1). The symptoms among patients leading to disease in both comparative groups were found almost same. These were reported as symptomless 2(5%) in O.V group and 1(2.5%) in L.V group, dragging sensation and aching pain in scrotum or groin were found in 38(95%) cases of O.V group and 39(97.5%) of L.V group, positive cough impulse was seen 15 (37.5%) of O.V group and 10 (25%) of L.V group, infertility was found in 21 (52.5%) of O.V group and 23 (57.5%) of L.V group (Table No.1).

Data shows that there was no significant difference in grade among these groups, however majority of patients were belonging to grade III (OV=67.5% versus LV 60%) as compared to grade II( OV=32.5% versus LV =40%)(Table 1).

**Table:-1: Age and site, presenting complaints and grade wise percentage of open and Laparoscopic Varicocelectomy.**

Variable	Operative Procedure				
	Open Varicocelectomy		Laparoscopic Varicocelectomy		
	Number of Patients	%age	Number of Patients	% Age	
Age					
• 10-20 years	8	20%	6	15%	Mean Age : OV 25.72±6.0 years LV 27.58±6.6 years P value 0.325
• 21-30 years	22	55%	25	60%	
• 31-40 years	9	22.5%	8	20%	
• 41-50 years	1	2.5%	2	5%	
Site of Distribution					
• Right Side	2	5%	3	7.5%	
• Left Side	37	92%	36	90%	
• Bilateral	1	2.5%	1	2.5%	
Presenting Complaints					
• Symptomless	2	5%	1	2.5%	
• Dragging sensation and aching pain in scrotum or groin	38	95%	39	97.5%	
• Cough impulse	15	37.5%	10	25%	
• Infertility	21	52.5%	23	57.5%	
Grades of Varicocele					
• Grade II	13	32.5%	16	40%	
• Grade III	27	67.5%	24	60%	

Operative time ranged between 20 to 50 minutes in both groups. The mean time in OV group was  $29.70 \pm 8.498$  minutes and  $25.08 \pm 5.558$  minutes in LV group ( $p = 0.005$ ). The mild pain was observed in 7 (17.5%) patients of OV group and 16 (40%) patients of LV group. Similarly, Moderate pain was observed in 23 (57.5%) patients of OV group and 20 (50%) patients of LV group. Whereas, severe pain was described by 10 (25%) patients in OV group and 4 (10%) patients in LV group ( $p = 0.032$ ).

The common complications seen in this study were wound infection and hydrocele. The wound infection was found in 6 (15%) patients of OV group and 2 (5%)

patients of LV group. The hydrocele was seen in 5 (12.5%) patients of OV group as compared 2 (5%) cases of LV group. The Residual varicocele and recurrence of varicocele was observed in two cases (2.5%) of OV group and 3 cases of LV group with value  $p < 0.359$  (Table No.2). The duration of hospital stay varied from 1 to 5 days. It was longer about 2-3 days in 34 (85%) of OV patients as compared to LV cases where majority 36 (90%) were discharged within 1 to 2 days. The mean hospital stay in OV group was  $2.45 \pm 0.749$  days and LV group was  $1.85 \pm 0.736$  days ( $p = 0.001$ ) showing significant differences in mean hospital stay in both groups (Table No.2).

**Table:-2: Pain, complications and hospital stay wise percentage of open and Laparoscopic Varicocelectomy.**

Variable	Operative Procedure				
	Open Varicocelectomy		Laparoscopic Varicocelectomy		
	Number of Patients	%age	Number of Patients	% Age	
Pain					
• Mild	7	17.5%	16	40%	P value 0.032
• Moderate	23	57.5%	20	50%	
• Sever	10	25% %	4	10%	
Complications					
• Wound infection	6	15%	2	5%	Over all incidence of complications; OV 32.5% LV 17.5%
• Hydrocele formation	5	12.5%	2	5%	
• Residual Varicocele	1	2.5%	2	5%	
• Recurrence	1	2.5%	1	2.5%	
Hospital Stay					
• 1 day	0	0	12	30%	P value 0.001
• 2 day	28	70%	24	60%	
• 3 day	6	15%	2	5%	
• 4 day	6	15%	2	5%	

## DISCUSSION

Varicocele is a condition of varicosity and tortusity of the pampiniform plexus that is often associated with a reduction in the volume of affected testicle. Varicocele before puberty is rare and percentage of clinically evidenced varicocele in young male adults varies from 9-23% where as the disease increases to 40 percent among infertile patients<sup>8,9</sup>.

In this study age ranged from 11 to 50 years in both groups with high incidence in 3<sup>rd</sup> and 4<sup>th</sup> decade (OV= 77.5 % versus LV=80%). The mean age was  $25.72 \pm 6.026$  in OV group and  $27.58 \pm 6.694$  in LV group. The similar age group patients were found in other local studies as well<sup>10</sup>. The probable reasons include early diagnosis in those countries as a result of their regular medical checkups even at schools<sup>11</sup>. This study finds left varicocele as a commonest site in both groups (OV=92.5 versus LV=90%) followed by right side (OV=5% v/s LV=10%) where as bilateral varicocele was seen in 2.5 percent cases of each

group. The results coincide with the study carried out by Sangrasi AK et al in 2009. According to that Sangrasi found the patients with left unilateral varicocele in 92 % of OV group and 94 % of LV group<sup>12</sup>.

The dragging sensation and aching pain in scrotum or groin was the commonest presentation of patients (OV= 95% versus LV=97.5) in both group. This was followed by symptomless cases which included 5% among OV and 2.5 percent among LV group respectively. Whereas, Zucchi A<sup>13</sup> found 80 % patients with history of dragging sensation and aching pain. One reason towards the variations between both studies could be much early response of patients at diagnostic stages in the developed countries and poor response by the patients in developing countries including Pakistan. Varicocele was graded according to the criteria published by Lion PR et al<sup>14</sup>. The clinical examination revealed grade II varicocele in 32.5% of OV group and 40% of LV group and grade III varicocele in 67.5 % in OV group & 60 % of LV group. However, in study of

Sangrasi AK et al<sup>12</sup> 32% of the patients presented with grade II and 68% grade III and similarly Bebars GA<sup>8</sup> found majority of cases in grade II & III.

The operative time was longer in open varicocelectomy. The mean operative time for open varicocelectomy group was 29.70±8.498 minutes and for laparoscopic varicocelectomy was 25.08±5.558 minutes with range of 20 to 50 minutes in both groups (p value 0.005). The mean operative time of LV group reported in the present series was similar to that reported by Donovan and Winfield<sup>15</sup>, Tan et al<sup>16</sup> and Fuse H et al<sup>17</sup>. In local studies the mean operative time given by Iqbal M<sup>18</sup> was 20 minutes for LV group and 30 minutes for OV group.

Study reveals higher postoperative pain in OV group as compared to LV group. Moderate to severe pain was observed in 82.5 % patients of OV as compared to 60% of LV group. Whereas mild pain found in 17.5% of OV patients and 40% of LV cases. However other studies reveals higher postoperative pain in laparoscopic group as compared to open varicocelectomy group with p values at 0.004<sup>12</sup>.

Higher post operative complications were found in OV group (32.5 %) as compared to LV group (17.5) with P value of 0.359. Similar trend was recorded by Sangrasi AK<sup>12</sup>.

This study reports hydrocele in 12.5 percent of OV and 5 percent of LV group and recurrence rate at 2.5% in grade III cases of both groups. This has been well documented in different studies with higher grade of pre operative varicocele<sup>19</sup>. This is opposite to other studies which have reported a high rate of recurrence in laparoscopic varix ligation<sup>20,21</sup>.

Laparoscopic varicocelectomy has been performed by many surgeons as a day case surgical procedure<sup>16,22,23</sup>, the mean hospital stay after LV in this study was 1.85±0.736 relatively shorter than OV i.e., 2.45±0.749 with p value 0.001. The findings correlate with the studies by Lynch et al<sup>21</sup>.

The resumption to work was attributed to some cultural and social factors. Factors contributing to prolonged hospital stay are postoperative wound complication and the performance of additional operative procedure particularly inguinal hernia repair<sup>6</sup>. The study shows early resumption of work in LV group i.e., 2 weeks as compared to OV group i.e. 3-4 weeks days.

## CONCLUSIONS

The study compares different postoperative parameters like, severity of pain, haematoma, wound infection and hydrocele in between laparoscopic and open varicocelectomy. The results show that LV is superior than OV in terms of better cosmesis, less operative time, less complications, short hospital stay and early return to work.

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