

Original Research Article

# Laparoscopic varicocelectomy now the gold standard procedure for varicocele - A comparative study with open technique based on our experience

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## Abstract

**Background:** The link between varicocele and infertility was first reported by Celsus in 1<sup>st</sup> century AD but it was not widely acknowledged until TULLOCH and colleagues reported the improvement of sperm parameters in 26 of 30 patients undergoing varicocelectomy. Varicocele is defined as excessive dilatation of pampiniform venous plexus of spermatic cord. Varicocele is an important cause of infertility which can be corrected by surgery. Several methods have been used for its treatment including open surgical ligation of spermatic veins as well as laparoscopic varicocelectomy. Open varicocelectomy has more risk of recurrence and complications whereas laparoscopic varicocelectomy is simple, has less risk of recurrence and complication in expert hands.

**Objectives:** To compare Laparoscopic varicocelectomy with open varicocelectomy, in terms of post-operative pain, recurrence rate, hospital stay, cost, cosmetic and complication. To prove hospital stay was more in open group than laparoscopic group and also patient of laparoscopic group return to normal activities earlier than open group. To standardize the laparoscopic varicocelectomy procedure for varicocele.

**Materials and methods:** It was a randomized clinical trial done in Department of General Surgery, Vinayaka Mission Medical College, Karaikal. Study was carried out from 1<sup>st</sup> March, 2015 to 1<sup>st</sup>

March, 2016. A total 70 patients was taken in our study of its 36 patient undergone open varicocelectomy and 34 patient undergone laparoscopic varicocelectomy.

**Results:** Recurrence rate 0% in Laparoscopic Varicocelectomy and 5.6% in open varicocelectomy.

Wound complication was 0% in Laparoscopic varicocelectomy and 2.5% in open varicocelectomy.

Post-operative pain was more in open group as compared to laparoscopic varicocelectomy.

Laparoscopic varicocelectomy has less post-operative morbidity and early return to normal activity.

Also there was improvement in seminal analysis in both groups.

**Conclusion:** We would like to standardize laparoscopic varicocelectomy and make it as a gold standard for Varicocele by replacing open technique provided there is good experienced surgical team and good instrumentation. Cost of the procedure is comparatively high.

## Key words

Laparoscopic varicocelectomy, Gold standard, Varicocele, Open technique, Comparison.

## Introduction

Varicocele is dilatation of pampiniform venous plexus within the scrotum. It occurs in 5-20% in all males and 40% of infertile males. It causes heaviness in scrotum, difference in scrotal size, visible veins and testicular pain rarely [1-3]. 90% of Varicocele is found on left side while approximately 10% are bilateral. Varicocele are common in males who are tall and heavy. Surgery is recommended treatment of choice for varicocele. Methods are open varicocelectomy [retroperitoneal (paloma), inguinal (ivaniserial) and sublingual]. Recently laparoscopic high ligation was introduced. It has potential advantages of reduced morbidity; reduced pain and more rapid return to work compared to open approach [4-7].

## Materials and methods

### Patients and Methods

In our study, 70 patients were randomly divided into laparoscopic group and open group. All 70 surgeries were done in department of general surgery of VMMC&H from 2015-2016 by a single surgical team. The mean age in Laparoscopic group is 27 years of age. It ranges from 15-50 year of age. The open group is ranging from 16-50 years of age. Mean age is 28 years. Diagnosis was done mainly by clinical examination and confirmed by Duplex scan. Varicocele was graded according to AMELAR AND DUBAL

Grade I (Small) - Varicocele palpable with Valsalva maneuver

Grade II (moderate) - Varicocele palpable without Valsalva maneuver

Grade III (Large) - Varicocele visible through scrotal skin.

Along with routine Investigation and anesthetic assessment, Semen analysis was performed for each patient preoperatively.

### Laparoscopic High Ligation

This surgery was done in general anesthesia. 10 mm camera port in umbilicus and one 10mm port in RIF and 5mm port in LIF were introduced. The parietal peritoneum overlying the testicular vessel was divided in order to make a window. Testicular vein were mobilized, grasped then Titanium LT 300 clip were applied over the testicular vein and divided. Care was taken not to injure the testicular artery.

### Open High Ligation

This surgery was performed under spinal Anesthesia. Incision was made 1/2 inch above and parallel to medial 2/3<sup>rd</sup> of inguinal ligament. EOA incised, internal oblique muscle were retracted. Internal spermatic vein were identified and testicular vein were ligated and divided using silk ties. After the surgery, both open and laparoscopic patient were accessed by examination of scrotum for presence of hydrocele, hematoma, wound infection and any

recurrence. Also in both procedure number of day of post-operative pain, hospital stay, return to work were accessed. Semen analysis was done 3 month after the surgery in both groups.

## Results

Out of 34 patients of laparoscopic group; 30 had left sided and 4 had bilateral Varicocele. Out of 36 patients in open group 31 had left sided and 5 had bilateral Varicocele. In Laparoscopic group: 5 patients had grade 1, 22 patients had grade 2 and 7 patients had grade 3 Varicocele. In open group; 4 patients had grade 1, 22 patients had grade 2 and 10 patients had grade 3 Varicocele. In laparoscopic group, mean operating time for doing unilateral surgery was 20 minutes and for bilateral surgery was 40 minutes. In open group, mean operative time for doing unilateral surgery was 30 minutes and for doing bilateral surgery was 50 minutes (**Table - 1**). Analgesics were given to the patients in both groups postoperatively when complained of pain. Analgesics required for laparoscopic study patients were less than open group. In Laparoscopic group 1 patient developed scrotal edema and 1 patient developed hydrocele. In open group; 1 patients developed orchids, 2 patients developed wound infection, 3 patients developed scrotal edema, 3 patients developed hydrocele and 2 had recurrence (**Table - 2**). Mean duration of hospital stay was 1-2 days for laparoscopic group and 3-4 days for open group (**Table - 3**). Mean return to normal activity was 3-4 days for laparoscopic and 6-7 days for open group (**Table - 4**).

**Table - 1:** Mean operative time.

Mean Operative Time	Laparoscopic Method	Open Method
Unilateral Surgery	20 minutes	30 minutes
Bilateral Surgery	40 minutes	50 minutes

Semen analysis was done in all patients pre-operatively and post-operatively after 3 months. There was improvement seen in both groups.

**Table - 2:** Post-operative pain.

Post-operative Pain	Laparoscopy (n = 34)	Open (n = 36)
	No. of Patients	No. of Patients
No Analgesics	5	0
1-2 Analgesics	29	4
3-4 Analgesics	0	12
4-5 Analgesics	0	20
Orchids	0	1
Wound Infection	0	3
Scrotal Edema	1	3
Hydrocele	1	3
Recurrence	0	2

**Table - 3:** Post-operative hospital stay.

Post-Operative Hospital Stay	Laparoscopy (n = 34)	Open (n = 36)
	1-2 days	3-4 days

**Table - 4:** Return to normal activities.

Return to Normal Activities	Laparoscopy (n = 34)	Open (n = 36)
	3-4 days	6-7 days

## Discussion

The varicocelectomy surgery was done in 70 patients were symptomatic or asymptomatic, to prevent infertility. Varicocele was seen in 30 out of 34 patients in laparoscopic groups and 31 out of 36 patients of open group were in left side. This observation was correct in other studies and right side is rare and left side is more [8]. In laparoscopic group: operative time for doing unilateral surgery ranged from 18-28 minutes. Mean time was 20 minutes. In open group; operative time for doing unilateral surgery ranged from 25-35 minutes and 30 minutes was taken mean time. The mean time for bilateral varicocelectomy in laparoscopic technique was 30-45 minutes and the mean time was 40 minutes and in open technique was 50 minutes. So in our study, mean time taken for laparoscopy is less than open which is contradicting to report of Poulsen. Semen characteristics increased significantly after treatment in both groups. It is been accepted that varicocelectomy improves

semen planeness in patients with varicocele. Almost 60-80% recovery rate is observed and it is been seen in 12 studies. Wound infection occurs commonly in open group (12 patients) and was not seen in Laparoscopic group. Orchitis was seen in 1 patient in open group and none in Laparoscopic group. Hydrocele was noted in 3 patients in open and 1 in Laparoscopic group. This study is in agreement with other studies as laparoscopic approach is having less chance of hydrocele due to better visualization of cord structures [9-12].

### Conclusion

Laparoscopic varicocelectomy is a minimal invasive procedure which is easily performed if there is good experienced surgical team and good instrumentation as it gives clear visualization and magnification than open surgery. So there is less chance for recurrence. Also compared to open if there is a good surgical team laparoscopic high ligation has advantages of short hospital stay, early return to normal activities and less post operative complications. Thus through our study we would like to standardize laparoscopic varicocelectomy and make it as a gold standard for Varicocele by replacing open technique provided there is good experienced surgical team and good instrumentation. Cost of the procedure is comparatively high.

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