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COMPARITIVE STUDY ON OPEN AND LAPAROSCOPIC VARICOCELECTOMY INA TERTIARY CARE CENTRE

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ABSTRACT:

INTRODUCTION: Varicocele is defined as an abnormal dilatation and tortuous Pampiniform plexus of veins. Only mode of treatment is surgical correction. Surgical procedure can be performed by open scrotal approach, open inguinal approach microinguinal or subinguinal approach, laparoscopic ligation or embolization of testicular vein by intervention radiologist. Advantages of laparoscopic varicocelectomy includes, safe, increased magnification, facilitating more accurate identification of vessels, lymphatics and the internal spermatic artery. An additional incision can be avoided in bilateral cases. **AIM OF THE STUDY:** To Compare Laparoscopic Varicocelectomy Versus Open Varicocelectomy.

METHODOLOGY: Single centre, prospective observational descriptive study, on 50 patients,in Government General Hospital, Kadapa fromDecember 2019 to December 2021.

RESULTLS & CONCLUSION: Varicocele was common in the 3rd and 4th decades and a significant cause of male infertility and common on left side. Laparascopic varicocelectomy is safe and effective procedure when compared to open varicocelectomy with significant reduction in operative time, minimal post operative complications and decreased hospital stay, increasing the patient satisfaction and comfort towards the procedure. There was no much significantin open and lap surgery over the pre operative and post operative semen parameters

KEYWORDS: Varicocele, Male Infertility, Open and Lap varicocelectomy

INTRODUCTION

Varicocele is defined as an abnormal dilatation and tortuous Pampiniform plexus of veins. The diseases is having

left sided predominance. This is explained byturbulent venous flow related to the insertion of left testicular vein at right angle into the left renal vein.

The prevalence of varicocele is as high as 10~15% in the general population, 30~35% are men with primary infertility, and 69~81% are with secondary infertility.

Classical description of varicocele is the consistency of "Bag of Worms" that can be decompressed when patient is in supine position. Some present with scrotal or inguinal aching discomfort or dragging pain.

In 95% cases no cause for varicocele could be found. This is called primary varicocele. Secondary varicocele is secondary to obstruction of testicular vein may bedue to retroperitoneal tumour or kidney tumour.

Only mode of treatment is surgical correction. Indication of surgical intervention are for medical fitness, Grade II and above varicocele, symptomatic patient and treating infertile couple with male partner detected having varicocele withqualitatively poor semen examination findings.

Surgical procedure can be performed by open scrotal approach, open inguinal approach microinguinal or subinguinal approach, laparoscopic ligation or embolizationof testicular vein by intervention radiologist. Open varicocelectomy can be sub

inguinal, inguinal or retroperitoneal. Commonly it is retroperitoneal approach through iliac incision. Laparoscopic approach can be performed using the intraperitoneal, pre-peritoneal approaches whereas embolization may antegrade or retrograde embolization.

Advantages of laparoscopic varicocelectomy includes, safe, increased magnification, facilitating more accurate identification of vessels, lymphatics and the internal spermatic artery. An additional incision can be avoided in bilateral cases.

In this study we compared Laparoscopic varicocelectomy versus open varicocelectomy for pros and cons.

AIMS AND OBJECTIVES

AIM OF THE STUDY:

To Compare Laparoscopic Varicocelectomy Versus Open Varicocelectomy

OBJECTIVES:

- To assess safety and efficacy of laparoscopic to open varicocelectomy.
- To compare laparoscopic versus open varicocelectomy in terms

1. Duration of Surgery
2. Hospital stay
3. Postoperative analgesia requirement
4. Postoperative recovery

Age in Yrs	Group A (n=25)	Group B (n=25)

5. Complications

PATIENTS AND METHODS

Study Design : Single centre, prospective observational descriptive study

Sample Size: Study was conducted on 50 patients

Study Setting: Patients admitted in the Department of General Surgery with varicocele requiring surgical intervention, in Government General Hospital, Kadapa.

Study Period: December 2019 to December 2021.

Inclusion Criteria:

1. All patients with clinical or radiological evidence of varicocele.
2. Patients with Primary varicocele

Exclusion Criteria:

1. Patients with secondary Varicocele
2. Patients with recurrent Varicocele.

Methodology:

Institute Ethical Committee clearance was obtained before the start point of the study. Patients admitted to the Department of General Surgery with Clinical orRadiological evidence of Varicoele were selected for the study using Simple RandomTechnique.

Thorough History, clinical examination and investigations including semen analysis were obtained and the results were recorded in a proforma. Patients fitness for surgery was obtained and cases were randomly grouped in to two groups. Group A patients had Open Varicocelectomy and Group B had Laparoscopic Varicocelectomy.

Patients were managed with post operative analgesics and antibiotics. Post operative analgesic requirements, complications like hydrocele, pain, odema, Total hospital stay and improvement in the semen parameters were compared in both the Groups and were analysed.

Statistics: The collected data were analysed with IBM SPSS Statistics for Windows, Version 23.0.(Armonk, NY: IBM Corp).To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables. To find the significant difference between the bivariate samples in independent groups the

<20 yrs	3 (12%)	3 (12%)
21- 30 yrs	8 (32%)	8 (32%)
31- 40 yrs	9 (36%)	9 (36%)
>41 yrs	5 (20%)	5 (20%)

Unpaired sample t-test was used. To find the significance in categorical data Chi- Square test was used similarly if the expected cell frequency is less than 5 in 2×2 tables then the Fisher's Exact was used. In all the above statistical tools the probabilityvalue .05 is considered as significant level.

OBSERVATIONS AND RESULTS

In the present study comparing the advantages of Laparoscopic Varicocelectomy over Open varicocelectomy the following results were obtained.

Table No 1: Age Distribution in the Study Groups

Of the 50 patients of varicocele included in our study 6 patients belonged to age group less than 20 years, 16 patients in 21-30 years group, 18 patients in 31 to 40 years group and 10 patients in age group more than 41 years group. From the above, it has been observed that most of the patients presented in the 3^{rd} and 4^{th} decades. Mean age in Group A was 31.9 years and Mean age in Group B was 32.8 Years.

Table No 2: Complaints in the Study Groups

Complaints	Group A (n=25)	Group B (n=25)
Swelling	14 (56%)	18 (72%)
Pain	12 (48%)	13 (52%)
Infertility	6 (24%)	5 (20%)
Pearson Chi-Square 3.350		P value 0.646

In our study we noted most common presentation of patient with varicocele as Swelling, which was noted in 32 patients, followed by pain in 25 patients. In 11 patientsit was noted infertility as complaint.

Table No 3: Side Involved in the Study Groups

Side Involved	Group A (n=25)	Group B (n=25)
Right Side	2 (8%)	2 (8%)
Left Side	19(76%)	19(76%)
Bilateral	4(16%)	4(16%)
Pearson Chi-Square .000 P value 1.000		

We have observed in our study that left sided varicocele was the most familiar presentation, which was seen in 38 patients followed by bilateral varicocele in 8 patients and right sided varicocele in 4 patients.

Table No 4: Ultrasound Grading in the Study Groups

USG Grading	Group A (n=25)	Group B (n=25)
Grade 1	3	3
Grade 2	9	10
Grade 3	13	12
Pearson Chi-Square 0.93 P value 0.955		

We have observed in our study, in laparoscopic group- 3 patients had grade 1, 10 patients had grade 2 and 12 patient had grade 3 varicocele. In open group: 3

patients had grade 1, 9 patients had grade 9 and 13 patients had grade 13 varicocele.

Table No 5: Mean Operative time in the Study Groups

Mean Operative Timein Min	Group A (n=25)	Group B (n=25)
	93.3	58

In our study we noted, in laparoscopic varicocelectomy group mean operative time was 58 min and in open varicocelectomy group mean operative time was 93.3 min. The p value for mean operative time was significant

(0.005)

Intraoperative Complications-

In both the groups, no vascular or intestinal complications are noted.

Conversion from laparoscopic to open approach also didn't occur either.

Post Operative Complications

During post operative period, pain was not assessed with visual pain analoguescale. Patients were given analgesics on demand on the day of surgery.

Table No 6: Post Operative Pain in the Study Groups

Post operative pain	Group A	Group B
Mild	1	18
Moderate	22	4
Severe	3	2

In the study 1 in Group A and 18 in Group B had mild pain, 22 in Group A and4 in Group B had moderate pain and 3 in Group A and 2 in Group B had severe pain according to the visual analogue scale.

Table No 7: Post Operative Complications in the Study Groups

Post Op Complications	Group A (n=25)	Group B (n=25)
Pain	7	4
Hydrocele	3	1
Scrotal Odema	4	2
Wound Infection	2	0

In our study of 50 patients, 3 patients from group A and 1 patient from group Bdeveloped hydrocele which was managed by rest, nonsteroidal anti-inflammatory

drugs and scrotal support. Scrotal oedema was noted in 4 patients from group A and2 patients from group B. Wound infection was noted in 2 patients from group A and none developed any wound infection group B. Wound infection was managed with oralantibiotics and nonsteroidal anti-inflammatory drugs. No recurrence noted in both thegroups.

Post Operative Hospital Stay-

In our study, 22 patients from group B stayed for 2 days and 7 patients for 3 days, mean hospital stay in group B was 2.3 days. In group A zero patients for 2 days,12 patients stayed for 3 days and 13 patients stayed for 4 days. Mean hospital stay ingroup A is 3.6 days. The p value is significant (0.0005)

Table No 8: Post Operative Hospital Stay in the Study Groups

Hospital Stay	Group A (n=25)	Group B (n=25)
2 days	0	22
3 days	12	7
4 days	13	0

Semen Parameters	Group A (n=25)		Group B (n=25)	
	Pre Op	Post Op (3months)	Pre Op	Post Op (3 months)
Mean Sperm Count	34.9	39.9	37	41.9
Mean % Motility	28	35	30	35.2
P value for sperm count 0.27		p value for sperm motility 0.953		

Table No 9: Pre and Post Operative Semen Analysis in the Study Groups

In our study, we have analysed the mean sperm count and mean % motility ofsperm in preoperative period and 3 months after the surgery. We have noted significant improvement in sperm count and motility in post operative period. The results were shown in the following table. It was noted no significant difference between group A and group B in sperm count and mean sperm motility.

Return to normal activities-

In the present study, duration to return to normal activity after surgery was 6-7days in group A and 3-4 days in group B. Motivation to patients and reassurance wasneeded to get them to normal activity.

Table No 10: Cross Tablation for statistics

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	p- value	Mean Difference	Std. Error Difference	Lower	Upper
Age	Equal variances assumed	.002	.966	-.351	48	.727	-.8400	2.3911	-5.6476	3.9676
Operative Time	Equal variancesnot assumed	13.030	.001	13.716	31	.0050	35.3600	2.5780	30.0999	40.6201
HospitalStay	Equal variancesnot assumed	4.658	.036	8.954	46	.0005	1.3200	.1474	1.0232	1.6168
Pre Count	Equal variances assumed	.859	.359	-1.202	48	.235	-2.4000	1.9964	-6.4140	1.6140
Post 3Count	Equal variances assumed	.677	.415	-2.287	48	.027	-1.9600	.8571	-3.6834	-.2366
Pre Motility in %	Equal variances assumed	.813	.372	-1.741	48	.088	-1.9600	1.1256	-4.2231	.3031
Post 3 Motility in %	Equal variances not assumed	4.701	.035	.059	38	.953	.0400	.6764	-1.3286	1.4086

Statistical analysis of the observations revealed that in the laparoscopic varicocelectomy group there was significant reduction in the operative time and hospital stay compared to open procedure. There was no statisticaaly significance in the age, semen analysis results in the pre operative and in the post operative follow up between the two groups.

DISCUSSION

Figure No 1: Incision for Open Varicocelectomy

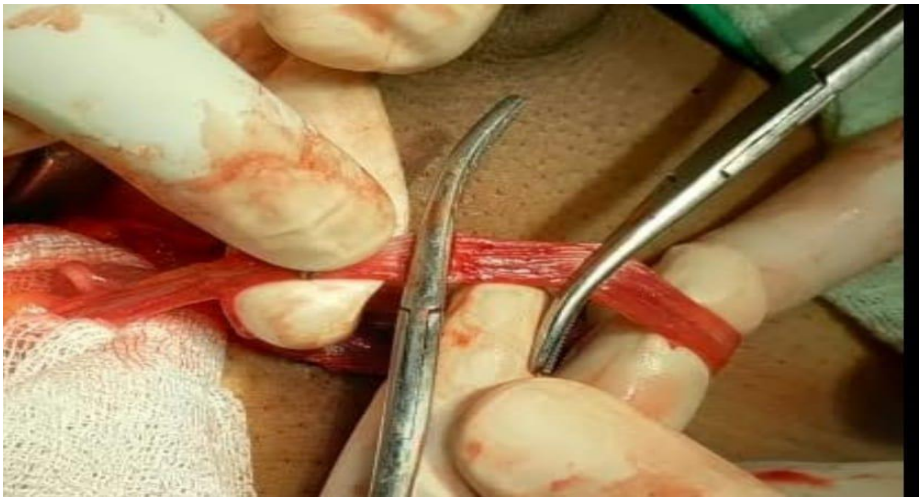

Figure No 2: Separation of Dilated Veins from the cord

Figure No 3: Ligation and division of the Veins

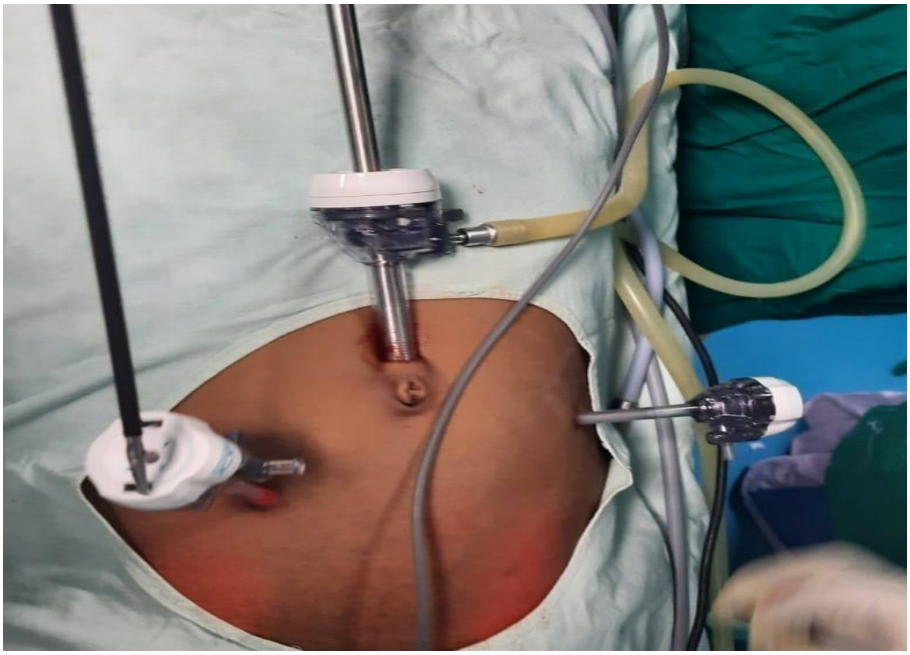

Figure No 4: Placement of Trochars in Varicocelectomy patient

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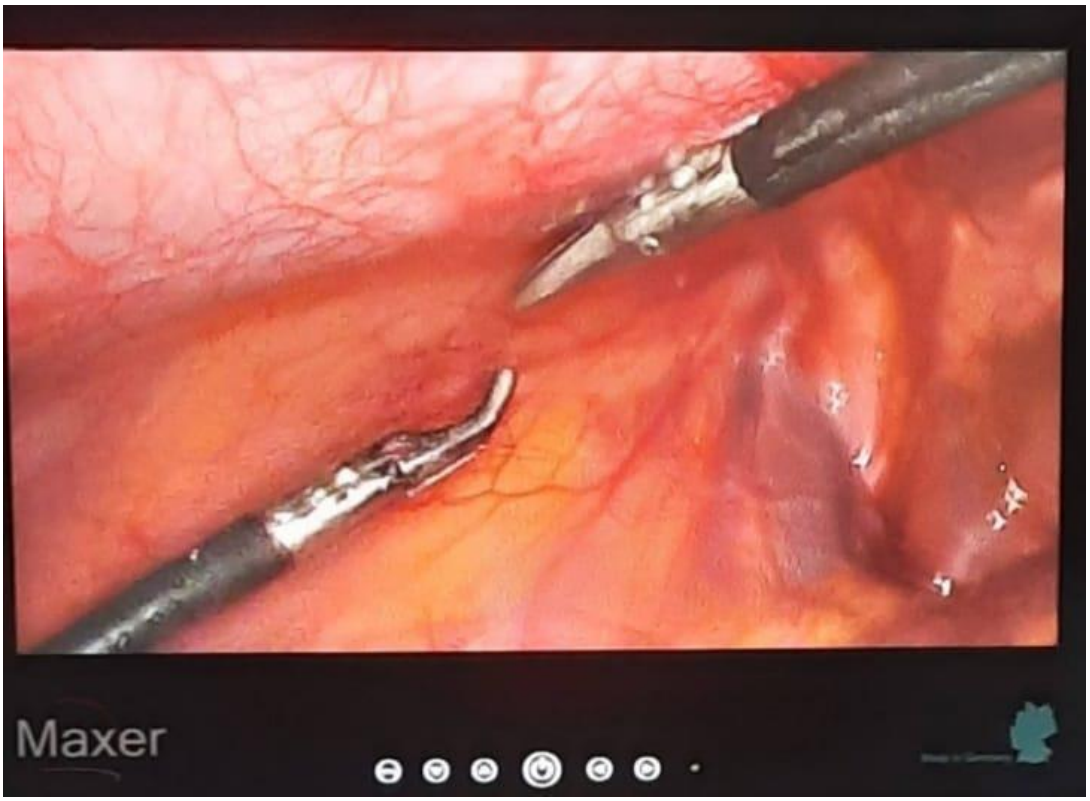

Figure No 5: Incision of peritoneum

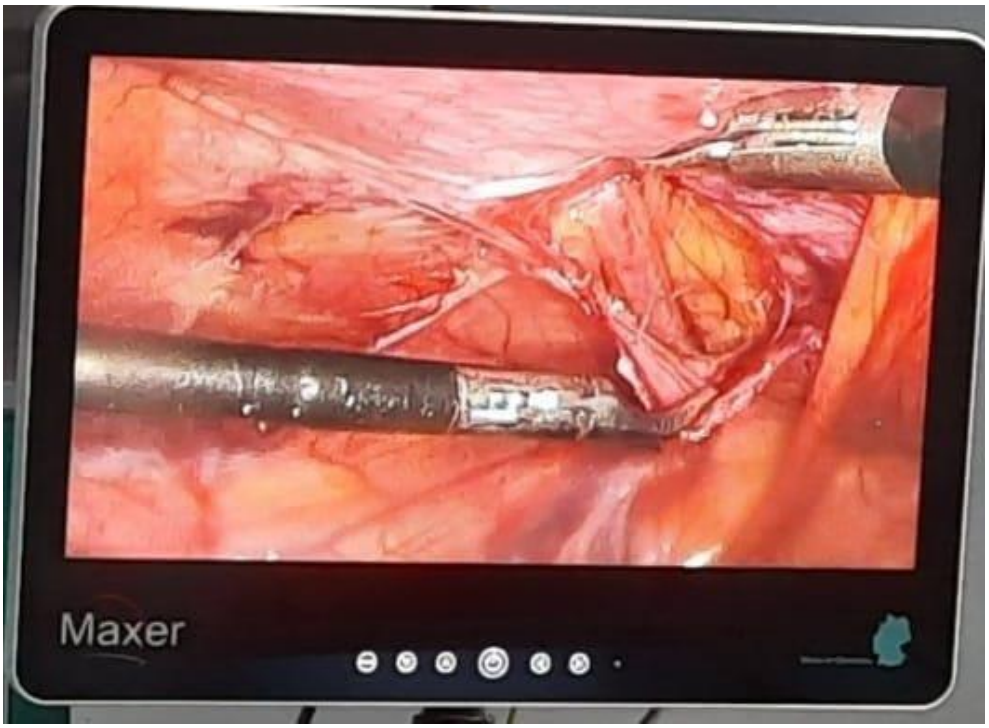

Figure No 6: Separation of the veins

Figure No 7: Division of the Veins and Clipping

Age

Table No 11: Comparison of Age Distribution in the Study Groups

Our Study	Dr. Vinod Atreya et al [1]	Shaukat Jeelani et al [2]	Atif Naeem Raja et al [3]	Siddarth Singh et al [4]
31-40 years(36%)	25-30 years (95%)	20-29years(54%)	15-45years(24.4%)	18years(45%)

Complaints

a) Swelling

Table No 12: Comparison of Swelling in the Study Groups

Our Study	Shaukat Jeelani et al [2]	Atif Naeem Raja et al[3]	Sunil Telkar et al[5]
32 (64%	51 (50%)	34 (87.1%)	8(26.66%)

b) Pain

Table No 13: Comparison of Pain in the Study Groups

Our Study	Dr.Vinod Atreya et al[1,6]	Atif Naeem Raja et al[3]	Sunil Telkar et al[5]
25 (50%)	6 (26.4%)	33 (84.6%)	18 (60%)

c) Infertility

Table No 14: Comparison of Infertility in the Study Groups

Our Study	Sunil Telkar et al[5]	Atif Naeem Raja et al[3]	Dr.Vinod Atreya et al[1,6]
11 (22%)	7 (23.3%)	5 (12.8%)	9 (32.4%)

Side Involved-

Table No 15: Comparison of Side involved in the Study Groups

	Our Study	Siddarth Singh et al[4]	Dr. Vinod Atreya et al[1,6]	Atif Naeem Raja et al[3]
Right	4 (8%)	2 (5%)	2 (7.6%)	30 (76.9%)
Left	38 (76%	29 (72.5%	24 (92.3%)	2 (5.1%)
Bilateral	8 (16%)	9 (22.5%	3 (10.2%)	7 (17.9%)

Grade

Table No 16: Comparison of Varicocele Grade in the Study Groups

Grade	Our Study	Siddarth Singh et al[4]	Dr. Vineeth Choudary et al[7]	Sunil Telkar et al[5]
I	6 (12%)	-	3 (6%)	8 (26.66%)
II	19 (38%)	21 (52.5%)	21 (42%)	11 (36.66%)
III	25 (50%)	19 (47.5%)	26 (52%)	11 (36.66%)

Mean Operation Time

Table No 17: Comparison of Mean Operative Time in the Study Groups

	Our Study	Bharathidasan et al[8]	Sunil Telkar et al[5]	Dr. Vineeth Choudaryet al[7]	Shaukat Jeelaniet al[2]	Atif Naeem Raja etal[3]	Ali Shamsaet al[9]
Group A (Open)	93.3 min	30 min	75 min	40 min	57 min		27 min
Group B (Lap)	58 min	20 min	37.5 min	56.3 min	48 min	48.4 min	30 min

Post OP Complications

a) Pain

Table No 18: Comparison of Post op Pain in the Open Groups

Pain	Open Varicocelectomy			
	Our study	Sunil Telkar et al[5]	Dr. Vineet Choudary et al[7]	Bharathidasan et al[8]
Mild	1 (4%)	5 (33.3%)	0	4 (11.11%)
Moderate	22 (88%)	7 (46.6%)	14 (56%)	12 (33.33%)
Severe	3 (12%)	3 (20%)	11 (44%)	20 (55.55%)

Table No 19: Comparison of Post op Pain in the Lap Groups

Pain	Lap Varicocelectomy					
	Our Study	Dr. VinodAtreya et al[1,6]	Atif Naeem Raja et al[3]	Sunil Telkar et al[5]	Dr. Vineet Choudaryet al[7]	R. Bharathidasan etal[8]
Mild	18 (72%)	15 (57.7%)	24 (61.5%)	8 (53.3%)	3 (12%)	29 (85%)
Moderate	4 (16%)	7 (26.9%)	14 (35.9%)	4 (26.6%)	-	-
Severe	2 (8%)	1 (3.8%)	1 (2.5%)	1 (6.6%)	-	-

b) Hydrocele

Table No 20: Comparison of Post op Hydrocele in the Study Groups

	Our Study	SiddharthSingh et al[4]	Ali Sharmaet al[9]	Sunil Telkar et al[5]	Dr. Vinod atreya et al[1,6]	Dr. Vineet etal[7]	ShaukatJeelan et al[2]
Group A(Open)	3 (12%)	3 (15%)	-	3 (20%)		1 (4%)	3 (12%
Group B (Lap)	1 (4%)	1 (5%)	1 (3.3%)	-	1 (3.8%)	1 (4%)	5 (20%

c) Scrotal Oedema-

Table No 21: Comparison of Post op Scrotal Odema in the Study Groups

	Our Study	Shaukat Jeelani et al[2]	R. Bharathidasanet al[8]	Ali Sharmaet al[9]	Siddharth Singh et al[4]

Group A (Open)	4 (16%)	1 (4%	3 (8.33%)	3 (10%)	1 (10%)
Group B (Lap)	2 (8%)	1 (4%	1 (3%)	4 (13.3%)	2 (5%)

d) Wound Infection-

Table No 22: Comparison of Post op Wound Infection in the Study Groups

	Our Study	Shaukat Jeelani etal[2]	R. Bharathidasan etal[8]	Dr. Vinodatreya et$_{al}$[1,6]	Dr. Vineetet al[7]	SiddharthSingh et al[4]
Group A (Open)	2 (18%)	6 (24%)	3 (8.53%)	1 (4%)	-	2 (10%)
Group B(Lap)	-	-	-	-	-	-

Post Operative Hospital Stay

Table No 23: Comparison of Hospital stay in the Study Groups

	Our Study		Shaukat Jeelani et al [2]		Dr. Vinod Atreya et al[1,6]		Siddharth Singh et al[4]	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
2 days	0	22 (88%)	41 (82%)	47 (94%)	-	23 (88%)	2 (10%)	8 (40%)
3days	12 (48%)	3 (12%)	6 (12%)	3 (6%)	-	2 (7.7%)	10 (50%)	12 (60%)
4days	13 (52%)	0	3 (6%)	0	-	1 (3.8%)	8 (40%)	0

Sperm count and sperm motility

Table No 24: Comparison of Semen parameters in Open Group StudyGroups

Semen parameters	Our study		Shaukat Jeelani et al[2]		Ali shamsa et al[9]	
	Pre Op	Post op (3 months)	Pre Op	Post op (3 months)	Pre Op	Post op (3 months)
Mean Count	34.9	39.9	46+/- 33	40+/-36	40+/-36	34+/-20
Mean % Motility	28%	35%	47+/-33	60+/-42	35+/-20	35+/-20

Table No 25: Comparison of Semen parameters in Lap Group Study Groups

Semen parameters	Our study		Shaukat Jeelani et al[2]		Ali Shamsa et al[9]		Dr.Vinod Atreya et al[1,6]	
	Pre Op	Post op (3 months)	Pre Op	Post op (3 months)	Pre Op	Post op (3 months)	Pre Op	Post op (3 months)
Mean Count	37	41.9	52+/-36	44+/-30	58+/-42	54+/-33	61.1	76.1
Mean % Motility	30%	35.2%	70+/-50	88+/-80	73+/-49	92+/-100	42.2%	59.5%

Return to normal activity

Table No 26: Comparison of return to normal activity in the Study Groups

	Our study	R.Bharathidasan et al[8]	Atif Naeem Raja et al[3]
Group A (Open)	6-7 days	6-7 days	
Group B (Lap)	3-4 days	3-4 days	3-5 days

CONCLUSION

From the present study comparing the advantages of Laparoscopic Varicocelectomy over Open varicocelectomy the following conclusions were made

Varicocele was common in the 3rd and 4th decades and a significant cause of male infertility and common on left side.

Laparascopic varicocelectomy is safe and effective procedure when compared to open varicocelectomy with significant reduction in operative time, minimal post operative complications and decreased hospital stay, increasing the patient satisfaction and comfort towards the procedure

There was no much significant in open and lap surgery over the pre operative and post operative semen parameters

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