ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 12 | December - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECT OF VARICOCELECTOMY ON SEMEN ANALYSIS AND CLINICAL PARAMETERS

General Surgery

Dr. Varun Pathak Assistant Professor, Dept. Of General Surgery, Rama Medical Collage, Hapur, U.P.

Dr. Prakriti Goswami* Assistant Professor, Dept. Of Obstetric and Gynecology, Rama Medical Collage, Hapur, U.P. *Corresponding Author

Dr. Urmila Sunda Senior Resident, Dept. Of Obstetric and Gynecology, SMS Medical Collage, Jaipur.

ABSTRACT

To determine changes in semen and clinical parameters following varicocelectomy. **Methods:** Prospective comparative study conducted on 30 patients at Santosh Medical college and hospital, Ghaziabad., undergoing varicocelectomy. Study aimed at comparing the semen analysis and various clinical parameters (pain VAS score and size of the swelling) postoperatively, at 3 month and 6 monthly follow up. **Results:** Semen pH value and total semen volume did not show any statistically significant improvement postoperatively. Post operatively statistically significant improvement was seen in total sperm count, motility as well as sperm morphology. The improvement was more when preoperative parameters were in lower range compared to normal range parameters. 7 patients who were oligospermic preoperatively showed marked improvement in their sperm count at 3 and 6 months respectively(p value 0.001); which is more significant improvement than preoperatively normospermic patients (p value 0.003). Postsurgery sperm motility showed significant improvement, better results were seen when preoperative motility was < 28% versus when motility was >28%. Significant improvement in sperm morphology postoperatively(p value 0.001)was seen, with better results in patients with preoperative sperm morphology <3% versus >3%. Mean VAS score showed statistically significant decrease at 3 months and at 6 months postoperatively (p value 0.001).83.3% patients were relieved of pain at 6months follow up post surgery. Of the 12 patients who presented with swelling, 11 patients showed significant decrease in swelling size at 6 months follow up postoperatively. **Conclusions:** We advice varicocelectomy in all patients of varicocele who are either clinically symptomatic with scrotal pain and swelling, and also in asymptomatic patients with subnormal semen parameters.

KEYWORDS

Semen analysis, Varicocele, Varicocelectomy

INTRODUCTION

A varicocele is a dilatation of the pampiniform venous plexus and the internal spermatic vein.

Varicocele occurs in approximately 15-20% of all males and in 40% of infertile males.[1]It causes progressive decline in testicular function over time[2][3], hence needs to be corrected surgically. Indications for doing varicocelectomy are still controversial. Surgical repair not only halts decline in testicular function but often reverses some of potential adverse effects.[4]We conducted this study to determine changes in semen characteristics as well as degree of relief of clinical symptoms in our patients undergoing varicocelectomy.

AIMS & OBJECTIVES

To determine changes in semen and clinical parameters following varicocelectomy.

MATERIAL & METHODS

Study Design: Prospective comparative study

Settings: Santosh Medical college and hospital, Department of General Surgery.

Study Duration: JAN 2014 TO APRIL 2015

Sample Size: 30

Inclusion Criteria

1. Symptoms of varicocele (pain, swelling).
2. Varicocele with oligospermia(Sperm count of less than 15 million per ml)
3. Varicocele with infertility.
4. Patients who were medically unfit (because of varicocele) on routine medical examination.

Exclusion Criteria

1. Azoospermic patient.
2. Primary hypogonadism.
3. Patient with history of recurrent UTI.
4. Systemic illness.
5. Atrophy of testis.
6. Patient having persistence of varicocele after previous surgery.
7. Secondary varicocele.

Study was approved by Institutional ethical committee and is in line with the declaration of Helinski and guidelines declared by ICMR. Informed written consent was taken from all patients. After proper history taking and thorough physical and inguinoscrotal examination , grading of varicocole was done. Semen characteristics like Appearance, volume, Ph, Liquefaction time, Sperm count, Motility, Morphology were noted.

Investigations Done:

1. USG & COLOUR DOPPLER OF THE INGUINO SCROTAL REGION : Veins 3.5 mm or larger in diameter, with reversal of venous flow after the valsalva manoeuver, is consistent with the diagnosis of a varicocele.
2. Hormonal profile : Serum LH, FSH, Testosterone
3. Fine needle aspiration cytology of both testes was done: patients with normal spermatogenetic and sertoli cells were only included in the study.

All 30 patients were subjected to Conventional (Ivanissevich) inguinal open approach Varicocelectomy under anaesthesia. Patients were followed on the 7th postoperative day, at 3rd and at 6th months. Parameters like changes in total sperm count, motility, morphology and symptomatic relief (pain relief & disappearance of swelling) were compared before and after the surgery.

Statistical analysis was performed using the chi-square test or student's t-test as applicable. Statistical significance was defined if the p value was <0.05.

RESULTS

Mean age of patients in our study was 27 years (youngest 18 years; oldest 39 years). Maximum patients were seen in the age group of 26 - 30 years.

Table 1 - Distribution of cases according to age

Age (Yrs)	Total	% age	Mean Age
≤ 20	6	17%	27.00
21-25	5	20%	
26-30	13	43%	
31 – 35	1	3%	
≥ 36	5	17%	

12 patients presented with pain and swelling, 10 were medically unfit and 8 patients presented with infertility. Out of total 30 cases 7 patients were found to be oligospermic on semen analysis.

Table 2 - Distribution of patients according to presentation

Complaints	No. patients	Oligospermic Pt
Pain & Swelling	12	1
Medical unfit	10	1
Infertility	8	5

60% of patients had bilateral varicocele and 40% had left sided varicocele. None had isolated, right sided varicocele.

Various parameters of semen analysis studied pre and postoperatively are shown in Table 3

Table 3- Semen Analysis In Patients Pre Operative And Post Operative At 3 And 6 Months

	Pre Operative			Post operative 3 month			Post operative 6 month			p Value
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
pH	7.77	0.27	7.85	7.65	0.32	7.50	7.73	0.45	7.50	0.8
Volume	2.98	0.95	3.00	2.95	0.93	3.00	2.81	0.73	3.00	0.89
Sperm Count/ ml	29.33	18.42	27.00	46.76	19.30	45.00	55.16	16.37	50.00	0.000
Sperm Motility%	44.76	22.29	39.00	57.60	14.65	60.00	69.10	15.74	70.00	0.000
Sperm Morphology %	21.53	15.06	22.00	31.67	13.12	30.00	47.63	13.23	42.00	0.001

1].In this study, semen pH value varied from 7 to 8.5 and total semen volume from 1.5 - 4.5cc. Both parameters did not show any statistically significant improvement postoperatively.

2]. All patients postoperatively showed significant improvement in total sperm count values.(Table 3)

7 patients who were oligospermic preoperatively showed marked improvement in their sperm counts at 3 and 6 months respectively(**p value 0.001**); which is more significant improvement than preoperatively normospermic patients (**p value 0.003**).

Table 4-Sperm Count Improvement In Oligospermic And Normospermic Patients

Sperm Count/ml ($x10^6$)	Pre Operative			Post operative 3 month			Post operative 6 month			p Value
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
<15 (n=7)	9.85	2.79	10.00	37.57	10.21	37.00	43.00	7.23	42.00	0.001
>15 (n=23)	35.26	16.97	32.00	49.56	20.68	46.00	57.13	17.51	50.00	0.003

3].Post surgery, sperm motility showed significant improvement with mean value of 57.60 at 3 month and 69.10 at 6 month (**p value 0.000**) (Table3); better results were seen when preoperative motility was < 28% than when motility was >28%.

Table 5- Sperm Motility In Various Patients

Motility%	Pre Operative			Post operative 3 month			Post operative 6 month			p Value
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
<28 (n=10)	22.80	4.71	25.00	47.80	11.86	46.00	62.30	18.75	65.00	0.001
>28 (n=20)	55.75	19.17	60.00	62.50	13.62	62.50	72.50	13.23	70.00	0.003

4] Our study showed highly significant improvement in sperm morphology postoperatively(**p value 0.001**)(Table 3), with better results in patients with preoperative sperm morphology <3% versus preoperative morphology >3%.

Table 6- Sperm Morphology In Various Patients

Morphology%	Pre Operative			Post operative 3 month			Post operative 6 month			p Value
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
<3 (n=5)	1.80	0.84	2.00	25.40	7.92	30.00	35.60	5.13	35.00	0.0001
>3 (n=25)	25.48	13.29	24.00	32.92	13.70	31.00	50.04	13.07	47.00	0.0003

5].Out of 30 patients, 12 patients presented preoperatively with pain and swelling. 67% (8) of patients had mild pain and 33% (4) had moderate pain. None of the patient presented with severe pain. Pre-operative mean VAS pain score was 2.50, S.D 1.24 and median 2.00. Post surgery there is decrease in mean VAS score which is statistically significant at 3 months and at 6 months (**p value 0.001**).

Table 7-Mean VAS

	Pre Operative			Post operative 3 month			Post operative 6 month			p Value
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	
VAS	2.50	1.24	2.00	0.41	0.66	0.00	0.16	0.38	0.00	0.001

Out of total 12 patients presenting with pain, 4 patients complained of mild pain after 3 months and 2 out of these 4 patients complained of mild pain after 6 months postoperatively. 83.3% patients were relieved of pain at 6th monthly follow up visit.

6]. Out of total 12 patients who presented with swelling, 10 patients showed significant decrease in swelling after 3 months and 2 patients showed no change in swelling size.

After 6 months, total 11 patients showed decrease in swelling size and 1 patient showed no change in swelling size. None of the patients showed increase in swelling size.

There was no complication encountered during or after surgery. No significant wound or other local complication was recorded. Almost all patients in the study had shown improvement in semen analysis, pain score and swelling size. None of the patients had persistence of varicocele.

DISCUSSION

Mean age of the patients under this study was 27 years; youngest was 18 years and oldest patient was 39 years of age.

Most common mode of presentation was pain with swelling in the inguino - scrotal area.

Most of the patients (65%) had bilateral varicocele in our study similar to the study conducted by Gatet et al [1]

There was no significant difference in pH value and mean semen volume pre and postoperatively.

Varicocoele ligation improved semen quality, the effect best seen 3 to 7 months postoperatively[5][6] like that seen in our study.

Sperm count, motility, morphology showed significant improvement postoperatively in our study ,similar to the study conducted by Mc leod et al [7]

Sperm count, motility, normal morphology absolute improvement post operatively was better in patients with preoperative lower semen parameters compared to those with preoperatively normal semen parameters, as seen in study done by Dublin et al.[8]

Of 12 patients presenting with pain and swelling,8 had mild pain and 4 had moderate pain on VAS scoring.The Pre-operative mean VAS was 2.50 and postoperative mean VAS was 0.41 at 3 month and 0.16 at 6 month(p=0.001). Out of these 12patients, post surgery 4 patients complained of mild pain at 3 months- follow up, and 2 patients complained of mild pain at 6 months follow up. Total 10 patients (83.3%) were relieved of pain at 6 monthly follow up.

Out of total 12 patients who presented with swelling, 11 patients postoperatively showed significant decrease in swelling size at 6 months follow up.

This study also showed that on varicocele ligation improvement was noted in semen parameters like sperm counts, motility, and morphology and also in clinical parameters like pain and swelling . The semen and clinical parameters improves within 3-6 months in majority of patients. [6][7][9][10]

Limitations:

Small sample size and study duration. To know the role of varicocoelectomy in fertility improval, more studies need to be conducted.

CONCLUSION

All parameters seems to improve after varicocele ligation, thus indicating an improvement in semen and clinical parameters of the patients. The period of this study was too short to show whether fertility improves or not. We advice varicocelectomy in all patients of varicocele who are either clinically symptomatic with scrotal pain and swelling, and also in asymptomatic patients with subnormal semen parameters.

REFERENCES:

1] Gat Y, Bachar GN, Zukerman Z, Belenky A, Gornish M. Varicocele: a bilateral disease. Fertil Steril. Feb 2004;81(2):424-9. [Medline].
2] Butler GE, Ratcliffe SG. Serono symposia reviews. Serono Symposia Reviews 1984 (Suppl 1): 244.
3] Nilsson S, Edvinsson A, Nilsson B. Improvement of semen and pregnancy rate after ligation and division of the internal spermatic vein: fact or fiction? Br J Urol 1979;51:591-6.
4] Sharma RK, Agarwal A: Role of reactive oxygen species in male infertility. Urology 48: 835, 1996.
5] Bong gw, Koo hp. The adolescent varicocele: to treat or not to treat. UrolClin NorthAm.2004;31:509-15.
6] Colpi GM, Carmignani L, Nerva F, Piediferro G, Castiglioni F, Grugnetti C, et al. Surgical treatment of varicocele by a sub inguinal approach combined with antegrade intraoperative sclerotherapy of venous vessels. BJU Int. 2006;97:142-5.
7] McLeod J. Seminal cytology in the presence of varicocele.FertilSteril 1965;16:735-57.
8] Dubin L, Amelar RD. Varicocele size and results of varicocelectomy in selected subfertile men with varicocele. FertilSteril. 1970;21:606-9.
9] Menkveld R, Stander FS, Kotze TJ, Kruger TF, van Zyl JA. The evaluation of morphological characteristics of humanspermatozoa according to stricter criteria. Hum Reprod 1990;5:586-92
10] Liu DY, Baker HWG. Sperm nuclear chromatin normality: relationship with sperm morphology, sperm zonapellucida binding, and fertilization rates in vitro. FertilSteril 1992; 58:1178.