

A Prospective Study to Assess the Value of Varicocele Ligation in Improving the Semen Parameters (Sperm Count and Motility) In Cases of Male Infertility

Dr. K.A Dilip Vasant¹, Dr. Ramesh Kumar Korumilli², Dr. Muvva Sri Harsha³,
Dr. Naveen Deekonda⁴, Dr. Kanmathareddy Amulya⁵, Dr. Sameer Kumar⁶

¹ Assistant Professor, Department Of General Surgery, SVS Medical College, KNR University of Health Sciences, Telangana

² Professor & HOD, Department Of General Surgery, SVS Medical College, KNR University of Health Sciences, Telangana

^{3,4} Final Year Post Graduate, Department Of General Surgery, SVS Medical College, KNR University of Health Sciences, Telangana

^{5,6} Post Graduate, Department Of General Surgery, SVS Medical College, KNR University of Health Sciences, Telangana

Corresponding Author: Dr. K.A Dilip Vasant

Abstract: Introduction: Varicocele, an abnormal dilatation and tortuosity of the pampiniformplexus of veins is found in about 15% of the general population with a marked left sided predominance. However this incidence rises to 35% in men with primary infertility and 70 to 80% in men with secondary infertility. We decided to conduct a prospective study to assess the value of

varicocele ligation in improving the semen parameters in case of male infertility/subfertility and relief of symptoms following varicocelectomy in patients with painful varicocele.

Material and Methods: A prospective study of 30 adult male patients suffering from unilateral /bilateral varicocele presenting with infertility or pain was carried out at SVS medical college, Mahabubnagar, Telangana. Among the 30 patients, varicocele ligation done through inguinal approach was 19 patients and 11 patients underwent retroperitoneal approach. Among the 30 patients, 17 patients had left side varicocele, 11 patients had bilateral varicocele and 2 patients had right side varicocele. All the patients included in the study underwent varicocelectomy in the period ranging between April 2017 and February 2019 and their ages ranged from 19 yrs to 41 yrs.

Results: The hospital stay of the patients after undergoing inguinal approach was found to be 4.15 days as compared to the retroperitoneal approach of 4.09 days. The pregnancy rates achieved were better with inguinal approach [36.84%] as compared to Palomo.s approach [18.18%]. The overall improvement in semen quality was 63.8% and a year after surgery, there were 9 cases of pregnancy.

Conclusion: Individual having seminal parameters in the mid-range showed a greater improvement postoperatively when compared to individuals with very low counts or motility. In cases with symptomatic (painful) varicocele, the inguinal approach tended to produce better symptom relief in our study.

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I. Introduction

Varicocele, an abnormal dilatation and tortuosity of the pampiniform-plexus of veins is found in about 15% of the general population with a marked left sided predominance¹. However this incidence rises to 35% in men with primary infertility and 70 to 80% in men with secondary infertility. Mounting evidence clearly indicates that varicoceles cause progressive size and duration dependent testicular damage. Although varicocelectomy is the most commonly performed procedure for correction of male infertility with seminal improvement in 60 to 80% of the subjects and pregnancy rates ranging from 20 to 60% there is still no consensus on the best method of performing the varicocelectomy².

The other clinical presentation of varicocele is in the form of scrotal pain or heaviness in an adolescent or young adult or testicular hypotrophy in an adolescent.

There are many surgical approaches for repairing varicoceles which includes retroperitoneal, inguinal, subinguinal, scrotal and most recently minimally invasive procedures, such as laparoscopic varicocelectomy and percutaneous transvenous embolization, with each technique having their own set of advantages and disadvantages. Each of the open approaches has their share of proponents, the inguinal and retroperitoneal

techniques being more popular. The advent of laparoscopic varicocelectomy in the late 1980s and early 90s added another contender to the already preexisting argument over the best technique for varicocelectomy³.

We decided to conduct a prospective study to assess the value of varicocele ligation in improving the semen parameters in case of male infertility/subfertility and relief of symptoms following varicocelectomy in patients with painful varicocele.

II. Materials And Methods

Table 1: Total Number of Cases

	Inguinal	Palomo	Total
No. of cases	19	11	30
Indication			
Infertility	18	11	29
Pain	01		01
Site of varicocele			
Left	10	07	17
Right	01	01	02
Bilateral	08	03	11
Grade of varicocele			
Grade 1	03	01	04
Grade 2	07	05	12
Grade 3	09	05	14
Unmarried	02	02	04

A prospective study of 30 adult male patients suffering from unilateral /bilateral varicocele presenting with infertility or pain was carried out at SVS medical college, Mahabubnagar, Telangana. Among the 30 patients, varicocele ligation done through inguinal approach was 19 patients and 11 patients underwent retroperitoneal approach. Among the 30 patients, 17 patients had leftside varicocele, 11 patients had bilateral varicocele and 2 patients had right side varicocele. All the patients included in the study underwent varicocelectomy in the period ranging between April 2017 and February 2019 and their ages ranged from 19 yrs to 41 yrs.

A detailed history taking and clinical examination of the patient was carried out at the time of evaluation and admission. The clinical suspicion of varicocele was confirmed with the use of scrotal ultrasound and Doppler study.

The varicoceles were graded into Grades I (4 patients), II (12 patients) or III (14 patients) and the side of varicocele as left, right and bilateral on the basis of the USG and Doppler and the diameter of the veins were also noted. A semen analysis of the patient was obtained in patients presenting with infertility. Routine blood investigations were performed prior to surgery. The patients were randomly allocated to the inguinal or palomo group.

All patients received a dose of intravenous antibiotic just prior to incision; the antibiotic used depending upon the choice of the operating surgeon but belonging to the penicillin or cephalosporin groups. The course was completed with oral antibiotics for 5 days. The procedures were performed under spinal anaesthesia. The skin incisions were about 5 cm for inguinal, 3cm for Palomo's procedure. The veins were isolated in each of the procedures, milking of the veins done, ligated with silk/catgut and a segment of the veins excised between ligatures. The layers opened up were closed in anatomical fashion. Skin closure was with done skin clips or interrupted mattress sutures.

Details regarding the method of open varicocelectomy, post operative complications, duration of hospital stay, and number of days for return to normal activity was obtained from the patient and hospital records in the post operative period, at the time of discharge and 1 week after discharge. Postoperative pain was assessed by asking the patient to grade the pain on a scale of 0 to 3 on a daily basis for 3 days postoperatively with a score of 0 for no pain and 1, 2 or 3 for mild, moderate and severe pain respectively. Semen analysis was repeated after 3, 6 and 9 months postoperatively and enquired if the wife has conceived or not. The data collected was categorized based on the grade of varicocele, side of varicocele, and the type of approach performed on the patient. Post operatively both inguinal and retroperitoneal approaches were compared based on the improvement of semen parameters (sperm count and motility) at 3, 6, and 9 months, the number of days of hospital stay after surgery, postoperative hydrocele formation, the recurrence rate and the pregnancy rate achieved after 1 year of surgery.

III. Results And Analysis

The hospital stay of the patients after undergoing inguinal approach was found to be 4.15 days as compared to the retroperitoneal approach of 4.09 days. The postoperative pain score calculated over the first 3 postoperative days was found to be higher in with the inguinal group compared to Palomo group. A trend similar to the one seen with regard to the pain score was seen in terms of the number of analgesic tablets consumed by the patients in the first post operative week, number of days of hospital stay and number of days for return to normal activity. There were no instances of serious intraoperative or postoperative complications with either of the procedures. Improvement in sperm count is found to be achieved well with inguinal approach (75.2%) than Palomo.s approach (52.4%). The sperm motility is also better with inguinal [59.5%] than Palomo.s approach [51.5%].

The pregnancy rates achieved were better with inguinal approach [36.84%] as compared to Palomo.s approach [18.18%]

Occurrence of postoperative hydrocele was a feature noted only with the inguinal approach (5.26%). However the hydrocele noticed under our study resolved spontaneously over a period of time.

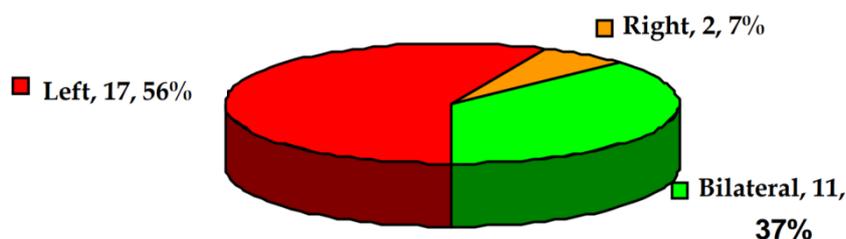
The overall improvement in semen quality was 63.8% and a year after surgery, there were 9 cases of pregnancy.

The pregnancy rate of 30% was comparable to that reported by Dubin (1977), Rajan (1978) and Bhide (1991) as shown in table 4

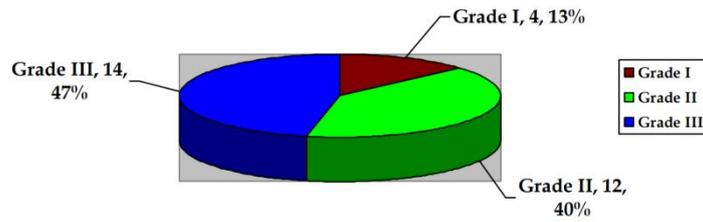
TABLE 2 : Comparison of inguinal and palomos procedure

S.No		Inguinal	Palomo
1.	No. of days of Hospital stay after surgery	4.15	4.09
2.	Improvement in Sperm Count	75.2%	52.4%
3.	Improvement in Sperm Motility	59.5%	51.5%
4.	Serious complications	0	0
5.	Post operative Hydrocele	5.26% [1]	0
6.	Recurrence	0	0
7.	Pregnancy rate achieved	36.84% [7]	18.18% [2]

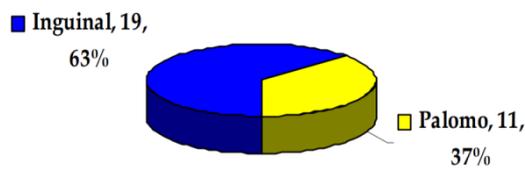
Side of Varicocele



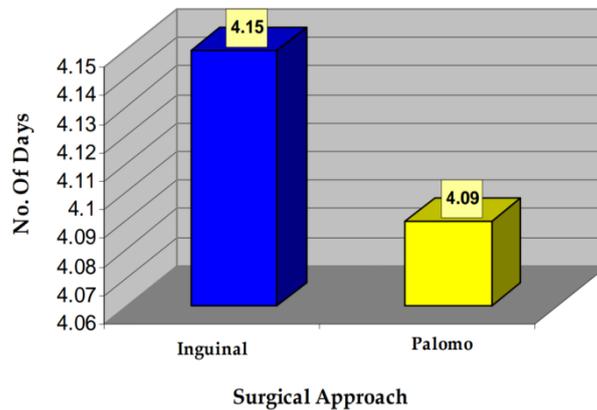
Grades of Varicocele



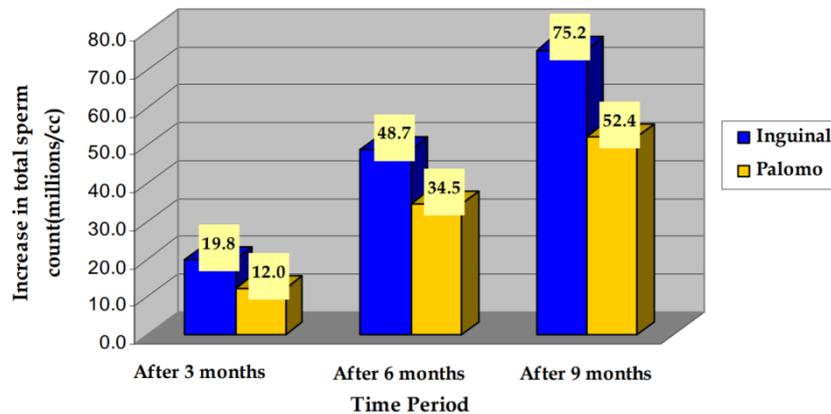
Number of Inguinal & Palomo Cases



Duration of Hospital stay after Surgery



Comparison of increase in total sperm count of Inguinal and Palomo approach



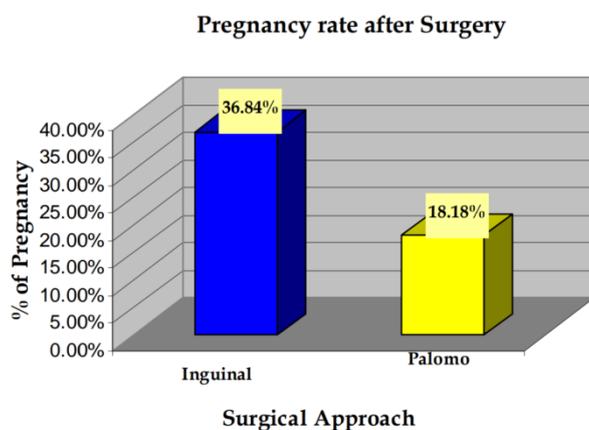
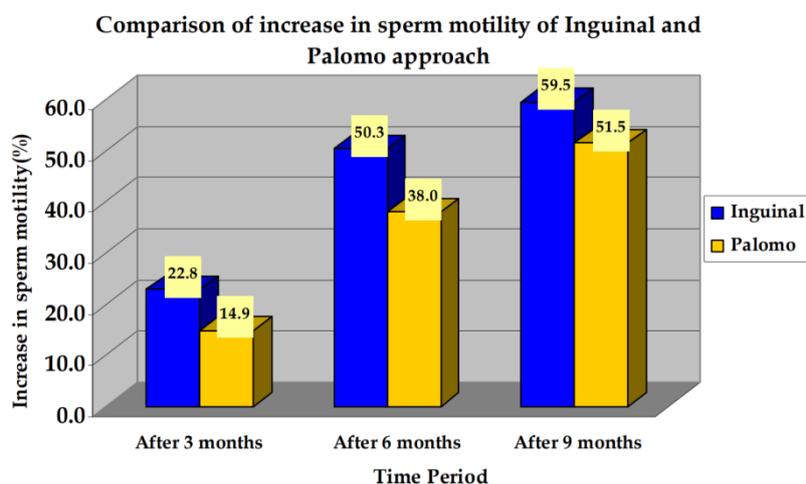


Table 3: OVERALL COMPARISON OF SEMEN PARAMETERS

	Average sperm count Millions/ml	Average sperm motility %
Before Surgery	31.93	44.5
After Surgery (after 9 months)	47.8	60

Table 4: OTHER STUDIES

S.No	Authors	Improvement in semen Quality %	Pregnancy rate%
1	Dubin et al (1977)	70	53
2	Rajan et al (1978)	62	34
3	Bhide et al (1991)	94	33
4	Our Study(2005-07)	63.8	30

IV. Conclusion

1. In cases operated for infertility, varicocelectomy performed through any approach tended to produce an improvement in the seminal parameters in the form of increased count and motility and decreased number of abnormal forms. The various approaches however varied in the duration of persistence of these improved parameters.
2. Symptom relief in patients who had undergone varicocelectomy for painful varicocele was found to be directly related to the size/ grade of the varicocele with greater improvement in large varicoceles compared to smaller ones. A similar pattern was seen in patients operated for infertility as well with greater improvements in seminal parameters noticed postoperatively in patients with larger varicoceles.
3. Individual having seminal parameters in the mid range showed a greater improvement postoperatively when compared to individuals with very low counts or motility.
4. In cases with symptomatic (painful) varicocele, the inguinal approach tended to produce better symptom relief in our study.
5. Postoperative pain is significantly higher in inguinal approach as compared to Palomo.s approach. A similar pattern was also reflected in the return to normal activity post operatively.
6. Postoperative hydrocele was seen as an occasional complication of inguinal approach (5.26%). The hydrocele resolved spontaneously in our study.
7. Varicocele is the surgically treatable cause of male infertility. Hence in the evaluation of infertile couples, males should be examined and investigated for the presence of varicocele.

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