



LAPAROSCOPIC VARICOCELECTOMY: AN OBSERVATIONAL STUDY FROM A TERTIARY CARE HOSPITAL OF KASHMIR

**Dr. Fayaz Ahmad Najar**

Registrar/Senior Resident, PG Department of Surgery, Government Medical College, Srinagar.

**Dr. Mufti Mahmood**

HOD/Professor, PG Department of Surgery, Government Medical College, Srinagar.

**Dr. Mohit Kumar\***

Postgraduate Scholar, PG Department of Surgery, Government Medical College, Srinagar. \*Corresponding Author

**Dr. Ranjeet Singh**

Postgraduate Scholar, PG Department of Surgery, Government Medical College, Srinagar.

**ABSTRACT**

**Background And Objectives:** To evaluate the usefulness of laparoscopic varicocelectomy in the management of symptomatic varicocele, as varicocele therapy is a controversial issue and no single approach is adopted as the best therapeutic option.

**Patients and Methods:** Between 2015 and 2019, 32 patients were treated with laparoscopic varicocelectomy at our institute with varying grades of symptomatic varicoceles. The most common symptom being dull scrotal pain, worsened with physical activity. All patients were followed up for 1 year (at 3 months, 6 months and at 1 year) with a physical examination, improvement in symptoms and to look for any post-operative complication/recurrence.

**Results:** A total of 32 patients were observed. The mean age of our study group was 26 years (range 18–48 years). Bilateral varicoceles were present in 8 patients (25%) and unilateral varicocele in 24 (75%). The varicocele was grade 3 in 19 patients (59.375%), grade 2 in 12 (37.5%), and grade 1 in 1 (3.125%). The mean operative time was 25.8 minutes (range 20 - 30 minutes). The mean post-operative hospital stay was 23.6 hours ( range 20 - 32 hours). There were no technical failures requiring conversion to open varicocelectomy. The mean follow-up period was 6 months (range 3 weeks - 18 months). There was de nova hydrocele formation in 2 patients (6.25%), recurrence was observed in 3 patients (9.375%). However no testicular atrophy was seen.

**Conclusion:** Laparoscopic varicocelectomy is a safe, efficient and less time consuming procedure for the treatment of symptomatic varicoceles and with a low complication rate and less loss of working days. However, careful patient selection is necessary.

**KEYWORDS :** Varicocele, Laparoscopy, Hydrocele, Recurrence

**INTRODUCTION:**

Idiopathic varicocele is defined as varicosity and tortuosity of the pampiniform plexus around the testis and funiculus spermaticus, caused by retrograde blood flow through the internal spermatic vein due to incompetent valves. The detrimental effect of varicocele on spermatogenesis in the sub-fertile male is manifested by low sperm count, decreased sperm motility and low percentage of normal sperm morphology together or in different combinations. Although many men with varicocele can father children but varicocele causes a progressive time-dependent decline in semen quality. In general, varicoceles do not regress spontaneously. It is one of the main correctable causes of male infertility and occurs in 6% of children (at age of 10 years), 13% of adolescents and 15% of males in the general population. However, varicocele has been observed in 35% of men with primary infertility and up to 80% of men with secondary infertility [1]. The indications for treatment include infertility, testicular growth impairment in adolescents, and chronic scrotal pain. Surgical ligation of varicoceles is widely used, mostly as a treatment modality for male infertility. Although numerous studies have confirmed beneficial effects on seminal parameters in patients treated for such an indication, only a few reports are available that have examined varicocelectomy as an option for the treatment of chronic scrotal pain [2,3]. Pain is the predominant complaint in 2% to 10% of patients with varicoceles. Patients describe pain as heaviness or a dull ache, generally after prolonged ambulation, worsening with physical activity and straining [4-6]. The optimal technique for varicocelectomy is still a matter of controversy. Techniques include open surgical ligation of the spermatic vein, retrograde or anterograde sclerotherapy,

microsurgery, and laparoscopy. Each technique has its own advantages and disadvantages, with contradictory results reported in the literature [7-12]. The potential complications of varicocelectomy are recurrence, hydrocele formation, and testicular atrophy [13].

**MATERIALS AND METHODS:**

Between 2015 and 2019, 32 patients underwent Laparoscopic Varicocelectomy for left-sided, right sided and bilateral grade 1, grade 2 and grade 3 varicoceles. Patients were selected with symptoms of dull scrotal pain and visible dilated ugly veins; attributed to varicocele after exclusion of other causes of scrotal pain. None of them were selected for infertility. Ultrasonography of the scrotum was done for all patients to see dilated testicular veins and to confirm the diagnosis. Varicoceles were classified into 3 grades during physical examination with the patient in a standing position and verified by ultrasonography (Table 1). In equivocal cases, colour Doppler ultrasonographic criteria to assess venous reflux were used.

**Table 1: Grading Systems For Varicocele**

Ultrasound Grading (Sarteschi)			
Grade	Reflux	Varicosities	Testicular Hypotrophy
1	During valsalva	None	No
2	During valsalva	Small	No
3	Clearly during valsalva	Overt	No
4	Spontaneous reflux, increased with valsalva or standing	Present in all positions	Common

5	Spontaneous reflux at rest without increase during valsalva	Venous dilatation in all positions	Yes
<b>Clinical Grading (Dubin and Amelar)</b>			
Subclinical	Seen on imaging, but no varicocele on examination		
Grade 1	Small, palpable with valsalva		
Grade 2	Moderate, palpable when standing without valsalva		
Grade 3	Large, easily visible		

The laparoscopic transperitoneal modified Palomo procedure was offered as a treatment modality to all patients who presented symptomatic varicoceles. Patients with sharp radiating scrotal pain, any other pathologic condition of the male reproductive system, a history of sexually transmitted disease, or previous infections of the lower genitourinary tract were excluded from the study. The initial approach was conservative management, which included scrotal support, lifestyle changes, and/or nonsteroidal anti-inflammatory drugs.

**Operative Technique**

The technique of laparoscopic varicocele ligation is straightforward. The procedure is usually performed using general anesthesia with patient in supine position. A urethral catheter is placed to empty the bladder, a Veress needle is placed at the umbilicus to inflate the peritoneal cavity with carbon dioxide. Alternatively, Hassons technique can be performed at the inferior margin of the umbilicus, and the trocar can be placed into the peritoneum under direct vision. Three laparoscopic ports are placed for varicolectomy according to baseball diamond concept.

The intra-abdominal vas deferens can be identified as structure joining the spermatic cord above the internal inguinal ring. The internal inguinal ring was identified by slight traction on the testis from outside. The traction on the testis causes visible tenting of the peritoneum on the deep ring thus to help identify testicular vessels. The gonadal vessels are thus visualized easily in the retroperitoneum. The posterior peritoneum is excised with cautery, harmonic scalpel or endoscopic scissors. The gonadal vessels are then mobilized. After identifying the gonadal artery (if identified), the gonadal vein or veins are isolated and mobilized using blunt dissection with atraumatic graspers (Figure A). Endoscopic clip applicator is used to secure it or intracorporeal suturing is used to ligate the gonadal vein or veins while sparing the artery. Usually four clips are applied on the vessels two centimeter apart and the middle section of the spermatic vessel excised, extracted and specimens send for histopathology confirmation (Figure B).



Figure A: Identification And Mobilization Of Gonadal Vein

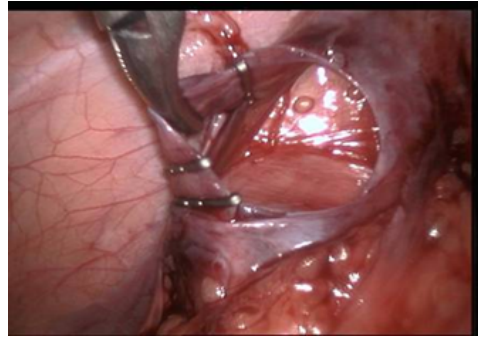


Figure B: Clipping Of Gonadal Vein

**Advantages Of Laparoscopic Varicolectomy Include:** increased magnification, facilitating more accurate identification of vessels, such as spermatic collateral veins, (i.e. veins running alongside the spermatic cord and together entering the internal ring, a possible cause of recurrence if left alone), lymphatics (the ligation of which can lead to hydrocele formation) and the internal spermatic artery. Moreover, laparoscopic varicolectomy is safe even after prior inguinal surgery. The characteristic supra-inguinal access allows for high ligation of fewer veins vs a more labour-intensive subinguinal approach. In cases of bilateral varicoceles, an additional incision, with its attendant effects, is avoided.

**RESULTS:**

A total of 32 patients were followed. The mean age group was 26 years (range 18–48 years). The mean follow-up period was 6 months (range 3 weeks - 18 months). Bilateral varicoceles were present in 8 patients (25%) and unilateral varicocele in 24 (75%). The varicocele was grade 3 in 19 patients (59.375%), grade 2 in 12 (37.5%), and grade 1 in 1 (3.125%) (Table 2). The mean operative time was 25.8 minutes (range 20 - 36 minutes). The mean post-operative hospital stay was 23.6 hours (range 20 - 32 hours). There were no technical failures requiring conversion to open varicolectomy. Patients recovered well and returned to work in 2 to 3 days. Sexual intercourse resumed in 1 to 2 weeks and sports were resumed in 2 to 3 weeks. Within 3 weeks of follow up all varicocele had marked reduction in size. Post-operatively, the de nova hydrocele formation was observed in 2 patients (6.25%). During follow-up, we observed recurrence in 3 patients (9.375%). All the recurrences were observed beyond 6 months of follow-up in our study (Table 3). However, no testicular atrophy was seen in the post-operative period.

Table 2: Distribution Of Patients According To Grade Of Varicocele (n=32)

Grade of varicocele	n (%)
3	19 (59.375)
2	12 (37.5)
1	1 (3.125)

Table 3: Demography And Results

Total patients	32
Unilateral cases (%)	24 (75%)
Bilateral cases (%)	8 (25%)
Mean age in years (range)	26 (18-48)
Mean operative time in minutes (range)	25.8 (20-36)
Mean length of hospital stay in hours (range)	23.6 (20-32)
Total complications (%)	5 (15.625)
• Hydrocele formation	• 2 patients (6.25%)
• 2. Recurrence	• 3 patients (9.375%)
Success rate (improvement in scrotal pain)	100%

**DISCUSSION:**

The ideal technique for varicocele repair is still a matter of controversy. The following criteria for the optimal procedure have been postulated: preservation and improvement of testicular function, elimination of the varicocele with a low recurrence rate and minimal intraoperative and postoperative complications and morbidity, and cost-effectiveness.

Successful treatment of painful varicoceles demands careful patient selection. The pain should be dull, aching, or throbbing and not sharp or radiating [2]. Exclusion of patients with other pathologic conditions of the male reproductive system and/or a history of sexually transmitted disease or inflammatory disease may have contributed to the success rate in our series (100%), as may have the inclusion of mostly grade 2 and 3 varicoceles, which are clinically more apparent and symptomatic.

The laparoscopic transperitoneal Palomo varicocelectomy was introduced in the early 1990s [14]. Since then, it has gained wide acceptance as a safe, simple, and minimally invasive procedure in both adults and children. Its most common postoperative complication is the occurrence of hydrocele, reported in up to 25% of patients [15]. The technique has several advantages in comparison with the more commonly used non-microsurgical inguinal approach. It offers excellent visualization of the spermatic vessels via a transperitoneal approach, which is especially helpful in obese patients. The number of veins to be ligated and the number of arteries to be preserved are smaller compared with the inguinal exposure, and their caliber is larger. Spermatic artery preservation is possible in 89% to 100% of cases [6]. Communicating venous branches from the kidney, iliac veins, or sigmoid colon can be easily identified and ligated. If left untreated, they may lead to recurrence or persistence of the varicocele. In cases of bilateral varicoceles, the laparoscopic approach allows for both sides to be treated during the same session without any additional intervention required. The rate of recurrent or persistent varicoceles is low after laparoscopic ligation compared with the traditional inguinal or retroperitoneal techniques [12]. We observed recurrence in 3 patient (9.375%). However in all 3 of these recurrences, the improvement in pain symptoms was significant. This shows a good effect of the initial procedure on the pain symptoms even in patients with a usually small recurrence.

The classical Palomo procedure has a relatively high rate of hydrocele formation compared to modified Palomo and other techniques. Sparing of the testicular artery, as with the modified (laparoscopic) Palomo procedure, decreases the rate of hydrocele [16]. This is confirmed in our series with a postoperative hydrocele rate of 6.25% (n = 2).

The recovery time after laparoscopic varicocelectomy is decreased when compared with the standard open inguinal approach. Our patients were able to return to work after a mean of 3.5 days (range 2–5 days). The mean operative times of our study group was significantly lower than the operative time, as shown in various studies, for microsurgical subinguinal varicocelectomy [11].

**CONCLUSION:**

Laparoscopic varicocelectomy is an safe, less time consuming and effective means of treatment with significant symptomatic improvement and a low complication rate, less hospital stay and minimum loss of working days for the patient. However, careful patient selection is necessary.

**Conflict Of Interest:** None declared

**External Source Of Funding:** None

**REFERENCES:**

- Oster J. Varicocele in children and adolescents: An investigation of the

- incidence among Danish school children. *Scand J Urol Nephrol.* 1971; 5: 27-32.
- Peterson AC, Lance RS, Ruiz HE. Outcomes of varicocele ligation done for pain. *J Urol.* 1998;159:1565–1567
- Biggers RD, Soderdahl DW. The painful varicocele. *Mil Med.* 1981;14 6:44 0–442
- Schlegel PN, Goldstein M. Alternate indications for varicocele repair: non-obstructive azoospermia, pain, androgen deficiency and progressive testicular dysfunction. *Fertil Steril.* 2011;96(6):1288–1293
- Chung SD, Wu CC, Lin VC, et al. Minilaparoscopic varicocelectomy with preservation of testicular artery and lymphatic vessels by using intracorporeal knot-tying technique: five-year experience. *World J Surg.* 2011;35( 8):1785 –1790
- Söylemez H, Kiliç S, Atar M, et al. Effects of micronised purified flavonoid fraction on pain, semen analysis and scrotal color Doppler parameters in patients with painful varicocele; results of a randomized placebo-controlled study. *Int Urol Nephrol.* 2012;44(2):401–408
- Cayan S, Acar D, Ulger S, et al. Adolescent varicocele repair: long-term results and comparison of surgical techniques according to optical magnification use in 100 cases at a single university hospital. *J Urol.* 2005;174:2003–2006
- May M, Johannsen M, Beutner S, et al. Laparoscopic surgery versus antegrade scrotal sclerotherapy: retrospective comparison of two different approaches of varicocele treatment. *Eur Urol.* 2006;49:384–387
- Enquist E, Stein BS, Sigman M. Laparoscopic versus subinguinal varicocelectomy: a comparative study. *Fertil Steril.* 1994;61:1092–1096
- Ulker V, Garibyan H, Kurth KH. Comparison of inguinal and laparoscopic approaches in the treatment of varicocele. *Int Urol Nephrol.* 1997;29:71–77
- Ghanem H, Anis T, El-Nashar A, et al. Subinguinal microvaricocelectomy versus retroperitoneal varicocelectomy: comparative study of complications and surgical outcome. *Urology.* 2004;64:1005–1009
- Gorber ED, Chan PT, Zini A, et al. Microsurgical treatment of persistent or recurrent varicocele. *Fertil Steril.* 2004;82:718–722
- Kass EJ. Adolescent varicocele: Current concepts. *Semin Urol.* 1988; 6: 140-145.
- Aaberg RA, Vancaille TG, Schuessler WW. Laparoscopic varicocele ligation: a new technique. *Fertil Steril.* 1991;56:776–777
- Hassan JM, Adams MC, Pope JC, IV, et al. Hydrocele formation following laparoscopic varicocelectomy. *J Urol.* 2006;175:1076–1079
- Barroso U, Andrade D, Novaes H, et al. Surgical treatment of varicocele in children with open and laparoscopic Palomo technique: a systematic review of the literature. *J Urol.* 2009;181(6):2724–2728