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Comparison of Laparoscopic vs Open Varicocelectomy for Varicocele of Testicular Veins

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ABSTRACT

Background: Management or repair of varicocele through surgery is the most common type of treatment. Repair can be done by applying open conventional varicocelectomy, laparoscopic varicocelectomy and microsurgical varicocelectomy. Till now studies have reported variables results regarding both laparoscopic and open repair for varicocele. **Objective:** To compare the outcome of laparoscopic versus open varicocelectomy of the testicular veins for management of varicocele in males. **Study Design:** Randomized Controlled Trial. **Settings:** Department of Surgery, Lahore General Hospital, Lahore Pakistan. **Duration:** Six months from December 11, 2019 to June 11, 2020. **Methods:** 80 (40 in each group) patients fulfilling the selection criteria were included in this study. These patients were randomly divided in two groups. In group A, patients underwent laparoscopic varicocelectomy. In group B, patients underwent open varicocelectomy. Both procedures were done under general anesthesia. operative time and wound infection were two outcome variables to be compared. **Results:** In this study shorter operative time was noted in group one (Laparoscopic varicocelectomy) as compared to group two (open varicocelectomy) with 27.52±2.02 minutes in group one vs. 33.62±2.80 in Open group two with p-value=0.000. group one (Laparoscopic varicocelectomy) had low frequency of wound infection as compared to group two (open varicocelectomy) i.e. 7.5% vs. 22.5%, p-value=0.060. **Conclusion:** Results of this study demonstrate that Laparoscopic varicocelectomy was better than open varicocelectomy for treating varicocele in males in terms of short operative time and less post-operative wound infection.

Keywords: Laparoscopic varicocelectomy, Open varicocelectomy, Operative time, Wound infection.

INTRODUCTION

Varicocele can progressively affect the testicular growth and function resulting in progressive decline in male fertility in terms of semen quality in this regard Fifty to sixty percent of men who have had their varicocele treated show improvement in semen quality.[1,2] The incidence of varicocele is around 4.4-22.6% in the general population. The management of varicocele with surgery is known as varicocelectomy, which includes the testicular veins ligation. Access to these veins can be achieved by sub-inguinal, trans-inguinal, or supra-inguinal incisions. This surgery can be conducted through open, laparoscopic, or embolization either; unilaterally or bilaterally.[3]

Idiopathic varicocele is a common complaint, which come across in several surgical settings and need surgical repair. Open surgical method has been used in many surgical settings for several years and is considered as the gold standard method but laparoscopic method can be a substitute for management of varicocele.[4] Treatment of varicocele is the controversial issue with no single approach, but in the last few years, varicocelectomy has been performed successfully via laparoscopy.[5,6]

It has been reported in a trial that mean operative and found wound infection with laparoscopic varicocelectomy was low as compared to open varicocelectomy.[7] But some other trial reported that in other way that mean operative time was low with open surgery than laparoscopic procedure but wound infection

was present high with open surgery VS laparoscopic procedure.[8] Due to varied results reported in international literature and scanty local data it was aimed to compare the outcome of laparoscopic versus open varicocelectomy of the testicular veins for the treatment of varicocele in in terms of operative time and wound infection rate with the objective to establish beneficial role of laparoscopic varicocelectomy for management of testicular veins in varicocele instead open surgery. So that in future, we may be able to implement results of this study in local setting.

METHODS

After taking approval from hospital ethical committee a Randomized Controlled Trial with double blinding was conducted at Department of General Surgery, Lahore General Hospital, Lahore Pakistan from December 11, 2019 to June 11, 2020 with Sample size (n) of 80 cases with probability sampling technique. Males of 25-60 years presenting with varicocele (defined as an enlargement of the veins within the loose bag of skin that holds testicles (scrotum) assessed on ultrasonography and complaint of infertility for >3months) were included. While patients with ASA III & IV, malignant disease, metastatic (on medical record), hemodynamically unstable (INR>2, Hb<10mg/dl), diabetes (BSR>200mg/dl) were excluded. these were divided in two groups by simple lottery method with 40 cases in each group by taking 80% power of study and 5% significance level non-probability, sampling in group A, laparoscopic varicocelectomy was done. In group B, open varicocelectomy was done. All procedures were done under general anesthesia by single surgical team with assistance of researcher. During surgery, operative time was noted in terms of minutes from incision till stitching of skin. After surgery, patients were shifted to the post-surgical wards and later on, discharged from there. Then all patients were followed-up in OPD for 10 days. During follow-up, if wound would not heal and pus present at wound site, then wound infection was labeled. All the information was collected through a specially designed proforma. A 95% confidence interval with 5% significance level was maintained while Data was analyzed by using SPSS version 21.

RESULTS

Demographics variables like name, age, were noted. The numerical variables like, duration of varicocele and operative time was presented as mean & standard deviation. The categorical variable like laterality (left, right, bilateral) and wound infection was presented as frequency and percentage. Both groups were compared for mean operative time by using independent samples t-test and for wound infection by using chi-square test. Data was stratified for confounder like age, laterality and duration of varicocele. Post-stratification, respective tests of significance were conducted to compare the outcome in both groups for ach strata. P-value≤0.05 was kept as significant.

Mean age of patients in Group-A and in Group-B was 40.55±11.23 and 42.10±9.40 years. In Group-A 14 (35%) patients had right, 12 (30%) patients left side and 14 (35%) bilateral side was effected while in Group- B 13 (32.5%) patients right, 13 (32.5%) patients left side and 14 (35%) patients bilateral sides were effected. Mean duration of varicocele in Group-A and in Group-B was 7.65±2.56 and 7.95±2.49 respectively as shown in table 1.

Table 1: Baseline characteristics of patients in both treatment Groups

	Laparoscopic varicocelectomy	Open varicocelectomy
N	**40**	**40**
Mean	40.55 ± 11.23	42.10 ± 9.40
Anatomical Side		
Right	14 (35%)	13 (32.5%)
Left	12 (30%)	13 (32.5%)
Bilateral	14 (35%)	14 (35%)
Duration of Varicocele	7.65 ± 2.56	7.95 ± 2.49

Mean operative time of Group-A and Group-B patients showed statistically significant difference. Patients in Group-A had lower operative time as compared to Group-B patients. i.e. Group-A: 27.52 vs. Group-B:33.62, p-value=0.000. Wound Infection was higher in Group-B patients but it was not statistically significant. i.e. Group-A: 7.5% & Group-B:22.5%, p-value=0.060 as shown table 2.

Table 2: Comparison of outcome in both Treatment Groups

	Laparoscopic varicocelectomy	Open varicocelectomy	p-value
N	**40**	**40**	
Operative time	27.52 ± 2.02	33.62 ± 2.80	0.000
Wound infection			
Yes	3 (7.5%)	9 (22.5%)	**0.060**
No	37 (92.5%)	31 (77.5%)	

DISCUSSION

Among all the major causes of infertility in males, varicocele is found to be the most common one.[9] Traditionally, open surgical procedures like inguinal or

retroperitoneal (Palomo), were used for repair of varicocele, while subinguinal approaches with the use of magnification represent some of the recent advances in open surgery for the management of varicocele. Laparoscopic varicocelectomy among the minimally invasive procedures is getting popularity as the substitute method with proven advantages due to ease, least invasiveness, better recuperation and less need of analgesia after surgery.[10] Each method has its own benefits and shortcomings, and contradictory outcomes have been identified in several trials, but up to now there is no harmony with regard to which method must be taken as the gold standard for management of the varicocele in pediatrics and adolescents.[11-14]

In this study shorter time duration was recorded in Laparoscopic varicocelectomy as compared to open varicocelectomy i.e. Laparoscopic varicocelectomy: 27.52±2.02 vs. Open varicocelectomy: 33.62±2.80, p-value=0.000. A local study from Pakistan showed that laparoscopic varicocelectomy to a time effective method. The mean duration of surgery was 27.44 ± 3.31 minutes by laparoscopic method and 36.79 ± 3.49 minutes with open varicocelectomy.[15]

Al-Hunayan et al., found that the mean surgical time was 21 ± 7 minutes by using laparoscopic varicocelectomy, which was almost similar as we observed in our study.[16] Simforoosh et al., also found that the mean surgical operative time was 17.2 ± 9.8 minutes with laparoscopic varicocelectomy while 31.02 ± 12.8 minutes with open varicocelectomy and difference was significant (p-value < 0.05). In above mentioned studies operative time for Laparoscopic varicocelectomy was reported to be lower when compared with this study but consistent with the findings of this study showing less operative time for Laparoscopic varicocelectomy.

In our study, we observed that the higher skill level and trainings in conducting a surgery through laparoscopic method among our surgeons can be the reason for reduced surgical duration for laparoscopic varicocelectomy. In contrast to the results of this trial, Barroso found that the surgical duration was long with laparoscopic method i.e. 53.5 ± 12.02 minutes as compared to open varicocelectomy which had shorter surgical duration i.e. 30 minutes.[17] A local study from Pakistan reported wound infection was observed in 11% cases with laparoscopic varicocelectomy while in 34.1% cases with open varicocelectomy. Barroso et al., also obtained results in favor of laparoscopic method and observed wound infection in 2% patients after varicocelectomy.[18]

Results of these both studies are in line with the findings of this study as in this study it was seen that patients who underwent laparoscopic repair among them frequency of wound infection was lower as compared to those patients who underwent open repair group i.e. 7.5% vs. 22.5%, p-value=0.060. Another local study from Pakistan reported no significant difference for wound infection for both laparoscopic and open group. 2% vs. 6%, p-value=0.617. A recently published study from Iraq reported the same findings as showing no significant difference regarding wound infection between laparoscopic and open repair i.e. 0% vs. 5%, p-value=0.307.[19]

Another study by MIRO JUKIC reported no significant difference regarding wound infection for both laparoscopic and open repair of Varicocele i.e. Laparoscopic varicocelectomy: 0% vs. Open varicocelectomy: 1%.[20] Several trial presented that both method i.e. open and laparoscopic varicocelectomies are similarly efficient, but laparoscopic method can have many advantages like reduced hospital stay, short operative time and quick post-surgical recovery with additional benefit of better cosmetic outcome with greater probability of consent for the treatment.[21] Also easier technique and better cosmetic results of laparoscopic method in cases of bilateral varicocele where surgery can be done via same ports, or to conduct other method at the same time, like inguinal hernia repair and orchidopexy.[22,23]

CONCLUSION

Results of this study demonstrate that Laparoscopic varicocelectomy is better than open varicocelectomy for treating varicocele in terms of short operative time and less post-operative wound infection.

CONFLICT OF INTEREST / DISCLOSURE

We declare no conflict of interest.

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