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Comparison of Laparoscopic and Open High Ligation Procedure for Varicocele

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Abstract

Varicocele is an important cause of infertility which can be corrected by surgery. We aim to assess and compare efficacy of laparoscopic and open palomo's technique for varicocele. A total of 70 patients were taken in our study to assess the efficacy of treatment. Open high ligation was done on 36 patients and laparoscopic high ligation was done on 34 patients. The hospital stay was more in patients of open group than of laparoscopic group. Also, patients of laparoscopic group returned to normal activities earlier than with open group. Recurrence rates were 0

Index terms— varicocele, laparoscopic, high ligation, infertility.

1 Introduction

aricocele is dilation of the internal spermatic veins and pampiniform plexus that drain the testis. [1] The incidence is 10-20% and 35-40% in general population and infertile males respectively. [2] It causes heaviness in scrotum, difference in scrotal size, visible veins or testicular pain rarely. 90% of varicoceles are on left side, while approximately 10% are bilateral. A right sided varicocele alone is rare. Varicoceles appear to be more common in males who are tall and heavy, although associated with l ower BMI than age matched controls. [3], [4], [5] There is increased incidence of varicocele in 1 st degree relatives, particularly brothers of affected males, suggesting a potential genetic basis. Surgery is recommended treatment of choice for varicocele; used methods include open surgical approaches like retroperitoneal (Palomo), Inguinal (Ivanissevich) and subinguinal. Recently, percutaneous embolization and laparoscopic high ligation are also introduced. It has been suggested that laparoscopic high ligation for varicocele has the potential advantages of reduced morbidity, reduced analgesic requirements and a more rapid rate of return to work compared with the standard open surgical approach. [6], [7] Diagnosis was done mainly by clinical examination and was confirmed by Duplex scan. Varicocele was graded according to Dubin and Amelar. [1] ? Grade I (small): varicocele palpable only with Valsalva's manoeuvre. (D D D D)

in the direction of the fibers and the internal oblique muscle retracted cranially to expose the internal spermatic veins proximal to the internal inguinal ring. Testicular veins were ligated with silk ties and divided. The outcome after surgery was assessed by examination of scrotum for complications like persistence, hematoma, hydrocele, wound infection, orchitis and recurrence in the period of follow up. Improvement in semen parameters was assessed by repeating semen analysi s after 3 months postoperatively.

Analgesic requirements were determined by the number of analgesic injections required in postoperative period. The hospital stay was derived by the mean number of days till the patient is fit for discharge postoperatively. The operative time was derived by the number of minutes from time of incision given until all wounds/ports are closed. Patients were followed for a minimum of 3 months; weekly for the first month and monthly for the next 2 months.

All the data was compiled on Microsoft excel computer program and were calculated to compare various parameters of the laparoscopic and open high ligation surgeries for varicocele. Chi-square and Student t-test

were applied to find level of significance. When $p < 0.05$ was found , results were considered statistically significant.

iii. In laparoscopic group; mean operative time for doing unilateral surgery was 30.17 minutes and for bilateral surgery was 51.75 minutes. In open group; mean operative time for d oing unilateral surgery was 30.74 minutes and for bilateral surgery was 53.2 minutes (Table 1).

2 RESULTS

3 Out

Injection diclofenac was given to patients in both the groups only when patients complained of pain. In our study, the average number of analgesic injections required was less in laparoscopic group .

No major intraoperative surgical complications occurred in our study. In laparoscopic group; 1 (2.9%) patient developed scrotal edema and 1 (2.9%) patient developed hydrocele. In open group; 1 (2.8%) patient developed orchitis, 2 (5.5%) patients developed wound seroma, 2 (5.5%) patients developed wound infection, 3 (8.3%) patients developed scrotal edema, 3 (8.3%) patients developed hydrocele and 2 (5.6%) had recurrence (Table 2).

Mean duration of p ost-operative hospital stay was 1.12 and 1.97 days in laparoscopic and open group respectively. (Table 3).

Mean duration of return to normal activities was 4.68 and 6.81 days in laparoscopic and open group respectively. (Table 4). Semen analysis was d one in all patients pre and 3 months post operatively. Improvements were seen in both groups. (Table 5).

4 DISCUSSION

The indication of surgery was presence of varicocele whether symptomatic or asymptomatic as early correction of varicocele prevents future infertility.

Mean age of presentation in laparoscopic group (26.91 years) was slightly higher than in open group (26.61 years). In our study, varicocele was seen in the third decade in most of the patients. This age matched with other studies, but is contrary to studies in the developed world where varicocele is diagnosed and treated at a younger age group . [8] In terms of laterality of varicocele, 30 (88.24%) out of 34 patients of laparoscopic group and 31 (86.11%) out of 36 patients of open group had left varicocele. This ob servation matched with other reports that a right sided varicocele is very rare and bilateral varicocele has incidence of 2.5-65% . [9] In laparoscopic group; operative time for doing unilateral surgery ranged from 24 to 48 minutes. Mean time taken was 30.17 minutes. In open group; operative time for doing unilateral surgery ranged from 24 to 50 minutes. Mean time taken was 30.74 minutes. So mean time taken for open surgery was slightly more than laparoscopic group but these results were not significant as p=0.64. In laparoscopic group; operative time taken for bilateral high ligation ranged from 48 to 55 minutes. Mean time taken was 51.75 minutes. In open group; operative time taken for bilateral high ligation ranged from 50 to 60 minutes. Mean time taken was 53.20 minutes. So mean time taken for open surgery was slightly more than laparoscopic group but these results are not significant as p=0.58. In contradiction to our study mean operative time in a rep ort by Poulsen et al. [10] , was 35 and 45 minutes.

Injection diclofenac was given to patients only when patients complained of pain. In our study, the average total number of analgesic injections required postoperatively was significantly higher (p=3.74 * 10-9) in the open group as compared to the laparosc opic group. This finding was in agreement with the study by Lynch, Badenoch and McAnena (1993) [11] Wound seroma occurred more commonly in open group (2 patients; 5.5%) and was not noted in laparoscopic group. This result was not statistically laparoscopic group. This result was not statistically significant as p=0.17. Orchitis was noted in 1 patient (2.8%) in open group and none in laparoscopic group but this was not statistically significant as p=0.33. Scrotal edema was noted in 3 patients (8.3%) in open group and 1 patient (2.9%) in laparoscopic group. But this difference was not statistically significant as p=0.34. Hydrocele was noted in 3 patients (8.3%) in open group and 1 patient (2.9%) in laparoscopic group. But this difference was not statistically significant as p=0.35. This finding was in agreement with other studies which also show that the laparoscopic approach is associated with less chances of hydrocele because of better visualization of cord structures. [12] Recurrence was noted in 2 patients (5.6%) in open group and none in laparoscopic group but this result was not statistically significant as p=0.17.

In laparosc opic group; duration of p ostoperative stay ranged from 1 day to 3 days and mean stay was 1.12 days. One patient stayed for 3 days due to his postoperative pain but no specific cause of pain was found and was treated by analgesics. In open group; duration of post-operative stay ranged from 1 day to 4 days and mean stay was 1.97 days. Two patients stayed for 4 days due to wound infections which were treated with antibiotics and dressing s. This difference in our study was statistically significant as p=5.75 * 10-7. Several studies have suggested that laparoscopic varicocelectomy has the advantage of a shorter hospital stay. This finding is in agreement with reports by Pouslen et al. and Lynch, Badenoch and McAnena (1993). [11] In laparoscopic group; duration of return to normal activities ranged from 4 days to 7 days and mean was 4.68 days. In open group; duration of return to normal activities ranged from 4 days to 10 days and mean was 6.81 days. So patients in laparoscopic group returned to their normal activities earlier than open group patients and this result was statistically significant as p=5.43 * 10-10.

Semen characteristics improved significantly after treatment in both group s of patients. It is accepted that varicocelectomy improves semen parameters in patients with varicocele, with a 60-80% recovery rate. Schlesinger, Wilets and Nagler (1994) reviewed 16 studies that assessed the effect of varicocelectomy on sperm density and rep orted that postoperatively significant improvement s were demonstrated in 12 studies. [13] They also reported that sperm motility improved after varicocelectomy in 5 out of 12 studies. [1]

Figure 1: CONCLUSION

Our study

compares laparoscopic and open high ligation technique for varicocele treatment.

II. EXPERIMENTAL SECTION

a) Patients and Method s

Figure 2:

Figure 3:

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1

Mean Operative Time	Lap (n=30)	Open (n=31)	P-Value
Unilateral Surgery	30.17	30.74	0.64
Bilateral Surgery	51.75	53.20	0.58

Figure 4: Table 1 :

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Post-operative Pain	Lap (n=34) Patients %		Open (n=36) Patients %		P-Value
No analgesic injection	5	14.7 0		0.0	
1 injectio n	24	70.6 4		11.1	3.74E-09
2 injectio n	5	14.7 12		33.3	
3 or more injections	0	0.0	20	55.6	
Orchitis	0	0.0	1	2.8	0.33
Wound Infection	0	0.0	2	5.5	0.17
Wound Seroma	0	0.0	2	5.5	0.17

Figure 5: Table 2 :

3

Post-operative Hospital Stay	Lap (n=34)	Open (n=36)	P-Value
Mean	1.12	1.97	5.75E-07
Range	1-3	1-4	-

Figure 6: Table 3 :

4

Return to Normal Activities	Lap (n=34)	Open (n=36)	P-Value
Mean	4.68	6.81	5.43E-10
Range	4-7	4-10	-

Figure 7: Table 4 :

5

Semen Characteristic		Treatment Before	Treatment After	P-Value	
	Sperm Count 70.18		75.79	2.2E-4	
Lap (n=34)	Sperm Motility Sperm	60.03 61.42	65.70 66.07	2.7E-12	2.1E-12
	Morphology				
	Sperm Count 69.64		75.67	1.2E-4	
Open (n=36)	Sperm Motility Sperm	59.86 60.53	65.64 66.42	1.8E-12	1.6E-12
	Morphology				

iv.

Figure 8: Table 5 :

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