

Original Research Article

A prospective comparative study of outcome between open lichtenstein versus laparoscopic repair of inguinal hernia

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ABSTRACT

Background: Laparoscopic hernia repair is technically difficult and has long learning curve than open repair. Moreover, with increased cost of procedure do patient really get benefited in terms of intraoperative time duration, post-operative pain and complications, length of hospital stays, and time taken to return to usual activity needs to be studied.

Methods: In this prospective observational study of 100 patients including unilateral, bilateral, direct and indirect inguinal hernia and excluding obstructed and strangulated hernia, 61 patients underwent open repair and 39 patients underwent laparoscopic hernia repair. Pain analysis was done with visual analogue scale. Unpaired student T test and Chi square test used ($p < 0.05$).

Results: Baseline characteristics age, sex of the two groups were similar. Mean operative time in laparoscopic group was 105.38 ± 35.13 minutes and in open group was 79.95 ± 31.12 minutes ($p < 0.001$). There was statistically significant difference in mean pain score of laproscopic verses open techniques ($p < 0.001$). Urinary retention was the most common post-operative complication in both groups but was statistically not significant. Mean hospital stay in laparoscopic group was 1.56 ± 0.50 days and in open group was 1.9 ± 0.50 days ($p = 0.002$). Mean time taken to return to usual activity in open repair was 41.10 ± 27.15 days and in laparoscopic group was 16.23 ± 6.37 days ($p = 0.001$).

Conclusions: This study showed that in laparoscopic repair of inguinal hernia patients have less post-operative pain, shorter hospital stays and early return to work. However, the laparoscopic technique had longer operative time duration.

Keywords: Inguinal hernia, Laparoscopic, Open, Technique

INTRODUCTION

Inguinal hernia accounts for 75% of all abdominal wall hernia with a lifetime risk of 27% in men and 3% in women. The hernia repair reaches a peak percentage of 4.2% for males aged 75 to 80 year, fall of after that. This pattern is similar for female except that the peak percentage of women aged 75 to 80 only reach about 0.4%.¹ As with the introduction of any new technology, debate have been challenging the benefits of laparoscopic over open surgery.² The adoption of laparoscopy in hernia surgery poses special problems. First will

laparoscopic hernia repair show recurrence rates as low as those demonstrated with well-established open methods both with and without the use of prosthetic mesh. Second, can the suggested shorter recovery time and shorter loss of work period after laparoscopic hernia repair compensate for the increase expenditure for the extra surgical equipment used and the need for general instead of regional and local anesthesia?³

Laparoscopic hernia repair is technically difficult and has long learning curve than open repair. Early reports from non-randomized studies of laparoscopic hernia repair

technique showed a possible advantage of TEP (Total extra peritoneal) technique over the TAPP (Trans abdominal pre peritoneal) with low recurrence rates and few operative complications because the abdominal cavity is not entered.⁴ The primary aim was to compare both the operative technique in terms of intra operative time duration, postoperative pain analysis, postoperative complications, length of hospital stay and return to usual activity.

METHODS

This study was conducted after prior approval from ethics committee of Narayana Multispeciality Hospital, Jaipur, Rajasthan and after taking informed consent from the patient.

The study was conducted in Department of General Surgery, Narayana Multispeciality Hospital, Jaipur from December 2017 to May 2019 (18 months) during which 100 patients were enrolled following the Inclusion and Exclusion criteria:

Inclusion criteria

All unilateral, bilateral and direct and indirect inguinal hernia were included in the study.

Exclusion criteria

Obstructed hernia, strangulated hernia were excluded from the study.

Group allocation

Patient were divided in two groups; Group 1 was of patient undergo open Lichtenstein repair of inguinal hernia and Group 2 was of patient undergo laparoscopic repair of inguinal hernia. Visual Analogue Scale (VAS) scale was used to assess the post-operative pain.

Statistical analysis

Descriptive and Inferential statistical analysis has been carried out in the present study using computer software (SPSS Trial version 23 and primer). The qualitative data were expressed in proportion and percentages, and the quantitative data expressed as mean and standard deviations. The difference in proportion was analyzed by using chi square test. The difference in means among the groups was analyzed using the Unpaired student T Test for parametric data. Significance level for tests were determined as 95% (p<0.05).

RESULTS

The mean age of the patient in laparoscopic group is 56.97±13.17 year while in open group is 54.90±20.57 year (p=0.577) which is statistically not significant. Hence both the groups were comparable according to

Age. In the study the mean operative time in laparoscopic group was 105.38±35.13 minute and in open group was 79.95±31.12 minute (p value<0.05), hence there was statistically significant difference in the operative time of both the groups (Table 1).

Table 1: Age statistics among the groups and operative time.

Age (years)				
Group	N	Mean	SD	P value
Lap	39	56.97	13.17	0.577 NS
open	61	54.90	20.57	
Total	100	55.71	18.00	
Operative time (minutes)				
Group	N	Mean	SD	P value LS
Lap	39	105.38	35.13	<0.001S
open	61	79.95	31.12	
Total	100	89.87	34.87	

Table 2: Visual analogue scale at different follow up period.

Group		At 6 Hours	At 24 Hours	At 1 Week
Lap	N	39	39	39
	Mean	5.85	3.08	0.26
	SD	1.159	1.133	0.442
Open	N	61	61	61
	Mean	7	4.11	0.75
	SD	1.225	1.305	0.596
Total	N	100	100	100
	Mean	6.55	3.71	0.56
	SD	1.321	1.336	0.592
P value LS		<0.001S	<0.001S	<0.001S

Table 3: Distribution of the cases according to post-operative complications.

Complication:	Lap.		Open		Grand Total	P value LS	
	N	%	N	%			
Wound infection	0	0	0	0	0	0	NA
Hematoma	0	0	0	0	0	0	NA
Urine retention	15	38	22	36	37	37	0.976
Hematuria	0	0	0	0	0	0	NA
Seroma	0	0	2	3	2	2	0.682
Incisional hernia	0	0	0	0	0	0	NA
Wound leakage	0	0	0	0	0	0	NA
Pulmonary embolism	0	0	0	0	0	0	

In our study post-operative pain was statistically less significant in laparoscopic group as compared to open group at 6 hours, 24 hour and 1 week post operatively (Table 2).

In the present study there was no statistically significant post-operative complication rate between open and laparoscopic groups (Table 3).

The mean hospital stay in laparoscopic group was 1.56 days and in open group was 1.9 days ($p=0.002$) which was statistically significant. Mean time taken to return to usual activity in open repair was 41.10 ± 27.15 days and in laparoscopic group was 16.23 ± 6.37 days (Table 4).

Table 4: Hospital stay and time taken to return to usual activity (days).

Hospital stay (days)				
Group	N	Mean	SD	P value LS
Lap	39	1.56	0.502	0.002 S
Open	61	1.9	0.507	
Total	100	1.77	0.529	
Time taken to return to usual activity (days)				
Lap	39	16.23	6.37	<0.001S
Open	61	41.10	27.15	
Total	100	31.40	24.72	

DISCUSSION

In this study we observed that there was no significant difference in mean age of patient in both groups. This was similar to earlier studies by Hamza et al and Tolba et al.^{6,7} All patients were male in both open and laparoscopic group. No female patient was operated during study time period. This indicates the low incidence of inguinal hernia in female.

In the study the mean operative time in laparoscopic group was 105.38 ± 35.13 minute and in open group was 79.95 ± 31.12 minute (p value <0.05), hence there was statistically significant difference in the operative time of both the groups (Table 1). These results were corroborate to Galeti et al, Garg et al and Murthy et al while Eklund et al and Mohammad et al study suggested that there was no statistically significant difference in mean operative time of both the groups.^{4,5,8,9} Therefore, we can conclude that the operating time of different surgical techniques varies between surgeons, and it reduces with experience. Moreover, in open technique mean operative time is less due to preexisting familiarity of the surgeon with the technique.

In our study post-operative pain was statistically less significant in laparoscopic group as compared to open group. At 6 hours mean pain score in open group was 7 ± 1.22 as compared to 5.85 ± 1.15 in the laparoscopic group. At 24 hour mean pain score in open group was 4.11 ± 1.30 as compared to 3.08 ± 1.13 in lap. Group and at

one week mean pain score in open group was 0.75 ± 0.59 as compared to 0.26 ± 0.44 in the lap. group. There was statistically significant difference in mean pain score of lap. versus open techniques ($p<0.001$) (Table 2). Similar findings had been seen by Sudershan et al, McCormack et al and Memon et al which also show less post-operative pain in laparoscopic technique.¹¹⁻¹³ When pain is low in post-operative period then patient will have early mobilization and better post-operative satisfaction.¹⁴

In the present study there was no statistically significant post-operative complication rate between open and laparoscopic groups. In the laparoscopic group 15 (38%) patient developed post-operative complication of urine retention as compared to open group in which 22 (36%) patient developed urine retention ($p=0.976$) which was statistically insignificant. In open group two patient develop seroma formation, which were managed conservatively while there was no seroma formation in lap. group ($p=0.682$) was statistically insignificant. There was no complain of wound infection, hematoma, hematuria, Incisional hernia, wound infection and pulmonary embolism in both groups (Table 3). This was similar to study done by Tolba et al, Sudarshan et al.^{7,11} Other studies also show less post-operative complication in laparoscopic group.¹⁸⁻²⁷ Where in McCormack et al showed that incidence of complication after laparoscopic repair were higher as compared to open repair.²⁸

In the study patient undergoing laparoscopic hernioplasty had shorter hospital stay then the open repair. The mean hospital stay in laparoscopic group was 1.56 days and in open group was 1.9 days ($p=0.002$) was statistically significant (Table 4). Likewise, results had also been seen in Sudershan et al and Galeti et al which suggest that the laparoscopic technique is better than open technique in terms of minimum hospital stay duration.^{8,11} Whereas in other studies by Hamza et al and Ansari et al and Collaboration et al showed that duration of hospital stay was same in both the groups.^{12,15,16}

There is a consensus in the literature that the patient who undergo laparoscopic inguinal hernia repair return to work and normal activity more rapidly than those who undergo open repair.²⁹⁻³⁰ In this study, mean time taken to return to usual activity in open repair is 41.10 days and in laparoscopic group is 16.23 days, ($p=0.001$) which was statistically significant (Table 4). Old patient having comorbidity where general anesthesia cannot be given were taken for spinal anesthesia and open surgery, hence there was delay in recovery seen in open surgery cases.

At present, the laparoscopic repair of hernia finds its clinical niche in patients with bilateral or recurrent hernias or in patient with unilateral hernia who require a minimal period of postoperative inactivity. The major advantage of laparoscopic approach is the ability to detect and repair a contralateral defect at the same operation with only moderate increase in operating time.

CONCLUSION

To summarize, it is of great importance that the laparoscopic technique has advantage in term of less post-operative pain, shorter hospital stay and early return to work. However the technique has clear drawback in longer operative time and need for general anesthesia.

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