ORIGINAL RESEARCH PAPER

General Surgery

COMPARATIVE STUDY BETWEEN LAPAROSCOPIC AND OPEN MESH HERNIOPLASTY IN UNILATERAL UNCOMPLICATED INGUINAL HERNIA

KEY WORDS: TAPP, TEP, OH

Dr. Satwik Nishan* PG Resident *Corresponding Author

Dr. Garima Saini Junior Resident

ABSTRACT

Inguinal and femoral hernias are the two main types of groin hernias. There are two types of inguinal hernias: direct and indirect. When abdominal contents push through the internal inguinal ring and into the inguinal canal, it results in an indirect hernia. An abdominal protrusion through the transversalis fascia within Hesselbach's triangle is referred to as a direct inguinal hernia. Hernia repair is a surgical procedure done either by laparoscopic or open method. This study compares the above surgical interventions on the basis of multiple factors to determine which of them the procedure of choice is in unilateral, uncomplicated inguinal hernia.

INTRODUCTION

Little has changed in hernia repair technique in the past 100 years. The situation has changed with the introduction of synthetic mesh. It can be implanted using laparoscopic or open methods. Ger and colleagues published the first study on laparoscopic hernia repair in 1990. [1]

The surgeon should select TEP or TAPP when there is a hernial recurrence and the prior procedure was performed using the open approach. Use of the Lichtenstein approach is recommended if the prior operation was a laparoscopic or endoscopic procedure. [2]

Lichtenstein's tension-free inguinal hernioplasty, which uses artificial mesh, is the preferred method for open inguinal hernia repair. [3] In skilled hands, the recurrence rate is less than 1%, as opposed to tissue repairs where it could be as high as 15%. [4]

Numerous studies have demonstrated the advantages of laparoscopic hernioplasty over open hernioplasty (OH), including reduced postoperative pain and morbidity, wound complications, postoperative pain, early return to exercise and job, and improved cosmetic outcomes. [5-6] However, compared to open surgery, it had certain drawbacks, including a greater recurrence rate in the early postoperative period and a twice as lengthy operating time. It also had a longer learning curve and higher hospital costs.

There are two approaches to perform laparoscopic hernioplasty: trans-abdominal preperitoneal repair (TAPP) and fully extraperitoneal repair (TEP). TEP does not require entering the peritoneal cavity, unlike TAPP and open hernioplasty. Technically, it takes away the risk of intraoperative accidents. Current study was designed to compare the open anterior tension-free repair with laparoscopic repair for safety and effectiveness.

MATERIALS AND METHODS

Study area:
Rama Medical College, Hospital and Research Centre, Hapur

Study population:
All cases of unilateral primary unobstructed inguinal hernia admitted in various surgical wards of RMCH, Hapur. Patients from all socio-economic backgrounds will be considered.

Sample size:
Patients above 18 years age having unilateral, primary inguinal hernia

Study Design: Prospective study

Study Interventions:
Patients are classified into either Open or Laparoscopic group.

Study duration: 1 year followed by 1 year follow up

Outcome of intervention:
The main aims of the study are: i) to compare the outcomes of laparoscopic inguinal repair with open repair, patient's duration of stay, complications that occur in open inguinal hernia repair and laparoscopic hernia repair and to arrive at a conclusion, ii) to evaluate the limitations of laparoscopic inguinal hernia repair, iii) to compare between the times taken for open and laparoscopic inguinal hernia repair and iv) to compare the costing of surgery of open and laparoscopic inguinal hernia repair.

Data collection Methods:
Written and informed consents were taken from the patients. Detailed patient history was taken and patient taken up for either open or laparoscopic repair.

All the laparoscopic operations were performed by totally extraperitoneal (TEP) or transabdominal preperitoneal (TAPP) procedures. Cases were selected by the nonprobability (purposive) sampling method.

Inclusion criteria:
Patients with unilateral inguinal hernia with reducible and non obstructive and primary hernias are included in the study.

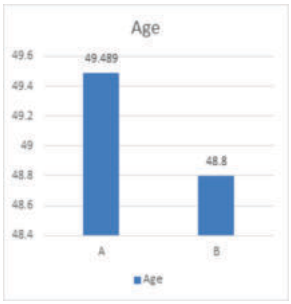
Exclusion criteria:
Complicated hernia, bilateral hernia, associated groin conditions like hydrocele, varicocele etc, recurrence and previous surgery with mesh in the same region, patients in American Society of Anesthesiologists (ASA) class IV (i.e., those who had systemic disease that is a constant threat to life) or class V (i.e., those who were unlikely to survive for 24 hours with or without operation), immunocompromised patients with malignancy were excluded.

Statistical Analysis
Group A – Open hernioplasty
Group B- Laparoscopic hernioplasty

Table : Age distribution of study participants:

Group	Mean	SD	Median	Minimum	Maximum	p-value
A	49.489	10.6614	49.000	25.0	70.0	0.793
B	48.800	10.0871	50.000	31.0	62.0	
Total	49.243	10.3915	49.000	25.0	70.0	

In our study, mean age I group A and B was 49.5±10.7 years and 48.8±10.1 years respectively. This difference was not found to be statistically significant.



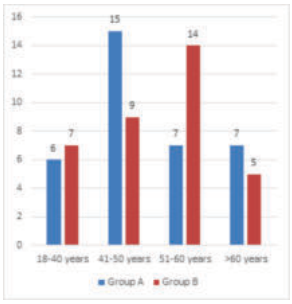


Table: Comparison of age between both group:

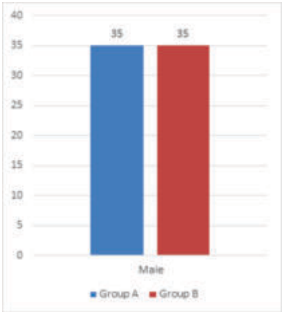
Age	Group A		Group B		p-value
	Count	%	Count	%	
18-40 years	6	17.1%	7	20.0%	0.236
41-50 years	15	42.9%	9	25.7%	
51-60 years	7	20.0%	14	40.0%	
>60 years	7	20.0%	5	14.3%	
Total	35	100.0%	35	100.0%	

In our study, in group A maximum participants i.e. 15 were belongs to age 41-50 years and in group B maximum i.e. 14 were belongs to 51-60 years. This difference was not found to be statistically significant.

Table: Comparison of gender between both groups:

Gender	Group A		Group B	
	Count	%	Count	%
Male	35	100.0%	35	100.0%
Total	35	100.0%	35	100.0%

In both groups all the participants were male.



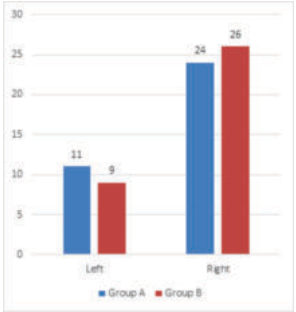


Table: Comparison of side between both groups:

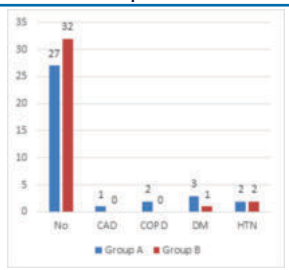
Side	Group A		Group B		p-value
	Count	%	Count	%	
Left	11	31.4%	9	25.7%	0.597
Right	24	68.6%	26	74.3%	
Total	35	100.0%	35	100.0%	

In our study, in group A and group B maximum participants i.e. 24 and 26 respectively were operated for right sided hernia. This difference was not found to be statistically significant.

Table: Comparison of comorbidities between both groups:

Comorbidities	Group A		Group B		p-value
	Count	%	Count	%	
No	27	77.1%	32	91.4%	0.352
CAD	1	2.9%	0	0.0%	
COPD	2	5.7%	0	0.0%	
DM	3	8.6%	1	2.9%	
HTN	2	5.7%	2	5.7%	
Total	35	100.0%	35	100.0%	

In our study, no statistically significant comorbidity different was found between both the groups.



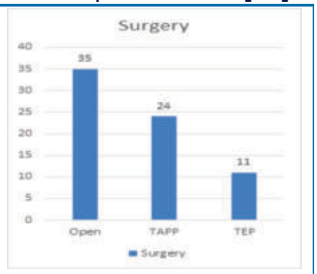


Table: Distribution of participants according to procedure

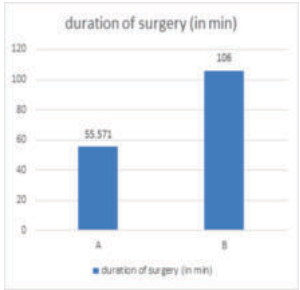
Surgery	Group A		Group B		p-value
	Count	%	Count	%	
Open	35	100.0%	0	0.0%	0.0001
TAPP	0	0.0%	24	68.6%	
TEP	0	0.0%	11	31.4%	
Total	35	100.0%	35	100.0%	

Out of 35 laparoscopic hernia repair, 24 was done as TAPP and 11 were as TEP.

Table 1: Comparison of duration of surgery (in min) between both groups

Group	Mean	SD	Median	Minimum	Maximum	p-value
A	55.571	8.2935	60.000	40.0	70.0	0.0001
B	106.000	11.4275	110.000	80.0	120.0	
Total	80.786	27.2620	75.000	40.0	120.0	

In our study a statistically significant high duration of surgery was found among the patients underwent for laparoscopic surgery compare to open hernia repair.



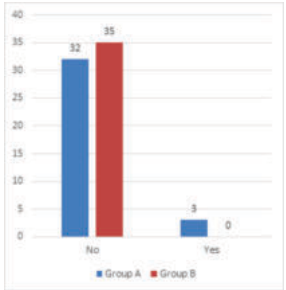


Table: Comparison of urinary retention between both groups:

In our study no statistically significant urinary retention difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Urinary retention was found in 3 patients among open hernia repair.

Table: Comparison of post-op seroma between both groups:

Urinary retention	Group A		Group B		p-value
	Count	%	Count	%	
No	32	91.4%	35	100.0%	0.239
Yes	3	8.6%	0	0.0%	
Total	35	100.0%	35	100.0%	

In our study a statistically significant seroma difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Seroma was found in 8 patients among open hernia repair.

Table: Comparison of post-op seroma between both groups:

Seroma	Group A		Group B		p-value
	Count	%	Count	%	
No	27	77.1%	35	100.0%	0.003
Yes	8	22.9%	0	0.0%	
Total	35	100.0%	35	100.0%	

In our study no statistically significant hematoma difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Hematoma was found in 3 patients among open hernia repair.

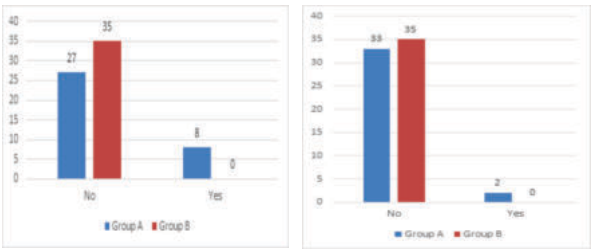


Table: Comparison of post-op wound infection between both groups:

Hematoma	Group A		Group B		p-value
	Count	%	Count	%	
No	33	94.3%	35	100.0%	0.151
Yes	2	5.7%	0	0.0%	
Total	35	100.0%	35	100.0%	

In our study no statistically significant post-op wound infection was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Wound infection was found in 4 patients among Laparoscopic hernia repair.

Table 1: Comparison of post-op pain according to vas score at 24 hours between both groups

Wound infection	Group A		Group B		p-value
	Count	%	Count	%	
No	31	88.6%	35	100.0%	0.069
Yes	4	11.4%	0	0.0%	
Total	35	100.0%	35	100.0%	

In our study, a statistically significant high post-op 24 hours VAS score was found among the patients underwent for open hernia repair surgery compare to Laparoscopic hernia repair.

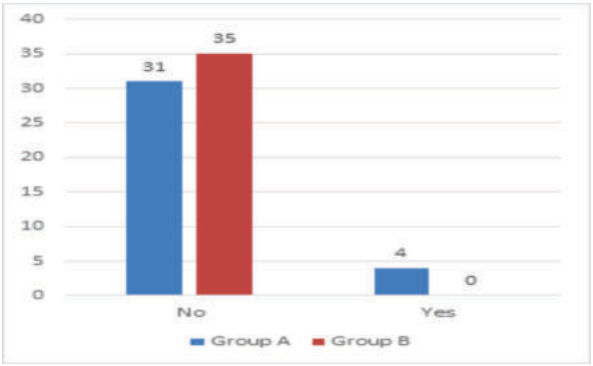


Table: Comparison of hospital stay (in days) between both groups

Group	Mean	SD	Median	Minimum	Maximum	p-value
A	7.400	.6508	7.000	6.0	8.0	0.0001
B	6.543	.9805	7.000	4.0	8.0	
Total	6.971	.9321	7.000	4.0	8.0	

In our study, a statistically significant longer hospital stay found among the patients underwent for open hernia repair surgery compare to Laparoscopic hernia repair.

Table: Comparison of recurrence between both groups:

Group	Mean	SD	Median	Minimum	Maximum	p-value
A	5.200	1.3460	5.000	4.0	9.0	0.001
B	3.629	2.2107	3.000	2.0	12.0	
Total	4.414	1.9817	4.000	2.0	12.0	

In our study no statistically significant recurrence difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Recurrence was found in 2 patients among laparoscopic hernia repair.

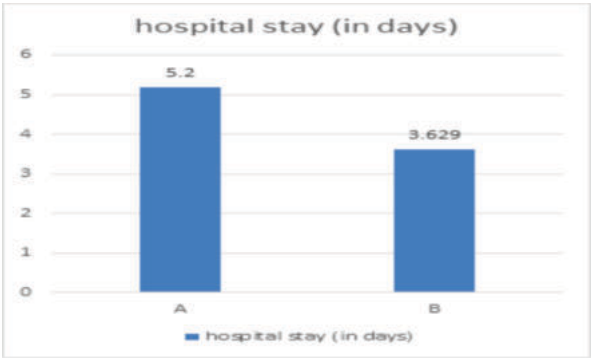
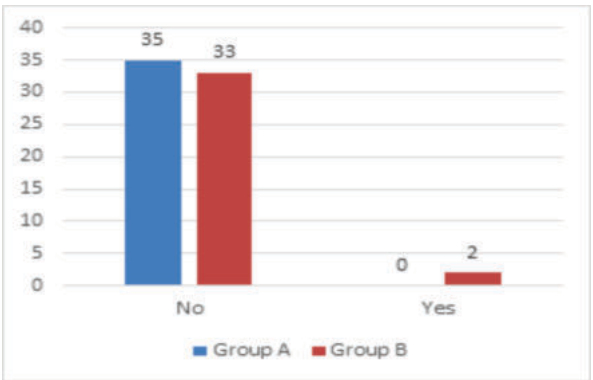


Table: Comparison of recurrence between both groups:

Recurrence	Group A		Group B		p-value
	Count	%	Count	%	
No	35	100.0%	33	94.3%	0.151
Yes	0	0.0%	2	5.7%	
Total	35	100.0%	35	100.0%	

In our study no statistically significant recurrence difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Recurrence was found in 2 patients among laparoscopic hernia repair.



CONCLUSIONS

In our study, mean age I group A and B was 49.5±10.7 years and 48.8±10.1 years respectively and in group A maximum participants i.e. 15 were belongs to age 41-50 years and in group B maximum i.e. 14 were belongs to 51-60 years. This difference was not found to be statistically significant.

In our study, in group A and group B maximum participants i.e. 24 and 26 respectively were operated for right sided hernia. This difference was not found to be statistically significant and no statistically significant comorbidity different was found between both the groups.

In our study no statistically significant urinary retention, wound infection and hematoma difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Urinary retention, wound infection and hematoma was found in 3,4 and 2 patients among open hernia repair.

In our study a statistically significant seroma difference was found among the patients underwent for laparoscopic surgery compare to open hernia repair. Seroma was found in 8 patients among open hernia repair.

In our study, a statistically significant high post-op 24 hours VAS score was found among the patients underwent for open hernia repair surgery compare to Laparoscopic hernia repair.
In our study, a statistically significant longer hospital stay found among the patients underwent for open hernia repair surgery compare to Laparoscopic hernia repair.

Hence it was concluded that inspite of higher cost and steep learning curve, laparoscopic hernioplasty has merits over open hernioplasty, provided it is done by experienced surgeons.

Conflict of Interest

The author of this article has no conflicts of interest to declare. Due permission from the Institutional Ethics committee was obtained before commencement of this study.

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