



COMPARATIVE STUDY OF PAIN SCORE, OPERATING TIME, MORBIDITY IN PATIENTS UNDERGOING LAPAROSCOPIC HERNIOPLASTY (LAPAROSCOPIC HERNIA REPAIR) AND OPEN HERNIA REPAIR

General Surgery

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ABSTRACT

BACKGROUND: A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Although a hernia can occur at various sites of the body, these defects most commonly involve the abdominal wall, particularly the inguinal region. Hernia repair is one of the most common operations performed by general surgeons. About 75% of all hernias occur in the inguinal region. Two thirds of these are indirect and the remainder are direct inguinal hernias. Femoral hernias represent only 3% of all groin hernias. Open Lichtenstein mesh repair and laparoscopic mesh repair are widely being practiced across the world.

AIM: The aim of this study is to assess the possible benefit of laparoscopic hernia repair compared to open mesh hernia repair based on Comparative study of pain score, operating time, morbidity.

METHODS: Study will be conducted on 100 patients (50 patients in each study group) who would be attending and would be admitted into the surgical O.P.D., I.P.D and Emergencies of Maharani Laxmi Bai Medical College, Jhansi during the study period between 2017-2019.

RESULTS: In our study the mean of VAS for pain scoring in the 1st 24 hrs after surgery was 2.06 ± 0.239 in the laparoscopic group & 3.08 ± 0.695 in the open hernia repair group. This difference was statistically very significant. Similarly in the next 24 hrs it was 1.38 ± 0.602 in the laparoscopic group and 2.02 ± 0.622 in open Lichtenstein hernia repair group. The duration of surgery in minutes was 35.52 ± 3.412 (mean) in the laparoscopic group and 27.20 ± 3.371 (mean) (P value 0.0001) in the Open Lichtenstein group. In our study the mean duration of stay (in days) postoperatively in the hospital was 2.94 ± 0.239 in the laparoscopic group as compared to 3.46 ± 0.613 in the Open Lichtenstein group ($p < 0.0001$).

CONCLUSION: The operating time is little longer in the laparoscopic procedure in comparison to open Lichtenstein repair. The post operative pain and complications (Seroma, Hematoma, Wound infection) are less in laparoscopic procedure in comparison to open Lichtenstein procedure. There is less hospital stay in laparoscopic procedure in comparison to open Lichtenstein procedure. There were no life threatening complications over a period of 12 month follow-up in both the groups.

KEYWORDS

Inguinal Hernia, Lichtenstein's repair, Laparoscopic hernioplasty, Post operative pain, Hospital stay.

INTRODUCTION

History of hernia repair is very rich and since ancient times surgeons have tried to improve it bit by bit. It is in fact a game of surgical anatomy, the one who understands the anatomy of Groin, can succeed in a way or the other to do a perfect repair. Herniorrhaphy is one of the commonest general surgical procedures performed and about 700,000 hernia operations are performed each year in the United States which is still on rise¹. Surgical outcome has improved tremendously due to improvements in surgical techniques, prosthetic materials and a better understanding of how to use them. Post operative pain, prolonged hospital stay and recurrence are a common problem associated with hernia surgery. Failure rate of less than 1% is reported from centers specialized in hernia surgery in contrast to much higher recurrence form non-specialized centers².

History of hernia repair is very rich and since ancient times surgSuccess of groin hernia repair is measured primarily by the permanence of the operation, fewest complications, minimal costs, and earliest return to normal activities. This success largely depends upon the surgeon's competencies, preoperative patient selection and preparation, knowledge and experience of effective use of surgical techniques and currently available materials for repair¹. Endoscopic hernia surgery has increased significantly with the introduction of new operating techniques during the past decade. Day care open hernia surgery is routinely being performed in selected centers all over the world. Prolonged hospital stay and post operative pain are of more concern for patients immediately after surgery. Surgeons performing laparoscopic hernioplasty claim that there is decreased post operative pain and short postoperative hospital stay as compared to open hernioplasty^{3,4}. Anyway controversy persists regarding the most effective inguinal hernia repair. one have tried to improve it bit by bit. It is in fact a game of surgical anatomy, the one who understands the anatomy of Groin, can succeed in a way or the other to do a perfect

repair. Herniorrhaphy is one of the commonest general surgical procedures performed and about 700,000 hernia operations are performed each year in the United States which is still on rise¹. Surgical outcome has improved tremendously due to improvements in surgical techniques, prosthetic materials and a better understanding of how to use them. Post operative pain, prolonged hospital stay and recurrence are a common problem associated with hernia surgery. Failure rate of less than 1% is reported from centers specialized in hernia surgery in contrast to much higher recurrence form non-specialized centers².

AIM AND OBJECTIVES

The aim of this study is to assess the possible benefits of laparoscopic hernia repair compared to open mesh hernia repair based on Comparative study of pain score, operating time, morbidity.

The following parameters will be evaluated for both laparoscopic and open procedures:

1. Operative techniques.
2. Operative time
3. Intra-operative complication
4. Post-operative complication
5. Post-operative pain and amount of narcotic-analgesic use (acute and chronic pain).
6. Post-operative recovery/ hospital stay.
7. Time to return to work
8. Recurrence
9. Chronic post-operative inguinal pain
10. Cost effectiveness
11. Learning curve

MATERIALS AND METHODS

Study will be conducted on 100 patients (50 patients in each study group) who would be attending and would be admitted into the surgical

O.P.D., I.P.D and Emergencies of Maharani Laxmi Bai Medical College, Jhansi during the study period between 2017-2019.

A thorough history and clinical examination with essential pre-operative investigation would be carried out on each patients. The patients will then be divided into unilateral and bilateral groups. In each group, the patients would be alternatively taken up for open/laparoscopic hernioplasty after matching for age and type of hernia. Laparoscopic hernioplasty would be carried out as a TAPP procedure or TEP procedure.

Open hernioplasty would be Lichtenstein hernioplasty.

INCLUSION CRITERIA:

1. Patients diagnosed as having inguinal hernia aged 18 years and above giving valid written informed consent.
2. Patients with unilateral or bilateral inguinal hernia.
3. Patients with recurrent inguinal hernia.

EXCLUSION CRITERIA:

1. Patients with strangulated/obstructed inguinal hernia.
2. COPD and cardiac decompensation.
3. Patients deemed unfit for anaesthesia. ASA>3.

RESULT

Table 1: Age distribution in study group

Age group (years)	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
16-30	15	30.00%	9	18.00%
31-40	12	24.00%	9	18.00%
41-50	11	22.00%	12	24.00%
51-60	7	14.00%	11	22.00%
>60	5	10.00%	9	18.00%

Table 2: Mean age distribution in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
Mean+SD	41.24	±15.427	47.4	±17.51

Table 3: Sex distribution in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
Male	50	100.00%	50	100.00%
Female	00	0.00%	00	0.00%

Table 4: Preoperative diagnosis distribution in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
Bubonocoele	41	82.00%	22	44.00%
Funicular	10	20.00%	19	38.00%
Scrotal (complete)	0	0.00%	10	20.00%

Table 5: Pre operative diagnosis in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
U/L Direct	0	0.00%	0	0.00%
U/L Indirect	42	84.00%	48	96.00%
B/L Direct (right direct + left direct)	1	2.00%	0	0.00%

B/L Indirect (right indirect + left indirect)	7	14.00%	2	4.00%
Combination (indirect + direct)	0	0.00%	0	0.00%

Table 6: Presenting complaint in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
Pain	50	100.00%	49	98.00%
Bulge	49	98.00%	50	100.00%
Fullness	48	96.00%	50	100.00%

Table 7: Post operative complications in study group

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
Seroma/Hematoma	0	0.00%	3	6.00%
Chronic pain	3	6.00%	5	10.00%
Recurrence	0	0.00%	2	4.00%
Wound infection	0	0.00%	3	6.00%

Table 8: Mean duration of surgery (in minutes) in study group.

Parameters	Number of patients			p value	
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)		
	Number of patients	Percentage	Number of patients		
Mean+SD	35.52	+3.412	27.02	+3.371	0.0001

Table 9: Pain score (1st 24 hours) in study group using visual analogue score

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
1-2	47	94.00%	10	20.00%
3-4	3	6.00%	26	52.00%
5-6	0	0.00%	14	28.00%

Table 10: Mean pain score (1st 24 hours) in study group using visual analogue score

Parameters	Number of patients			p value	
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)		
	Number of patients	Percentage	Number of patients		
Mean+SD	2.06	+0.239	3.08	+0.695	0.0001

Table 11: Pain score (next 24 hours) in study group using visual analogue score

Parameters	Number of patients			
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
1-2	48	96.00%	40	80.00%
3-4	2	4.00%	10	20.00%
5-6	0	0.00%	00	0.00%

Table 12: Mean pain score (next 24 hours) in study group using visual analogue score

Parameters	Number of patients			p value	
	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)		
	Number of patients	Percentage	Number of patients		
Mean+SD	1.38	+0.602	2.02	+0.622	0.0001

Table 13: Duration of hospital stay (in days) in study group

Parameters	Number of patients
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	Group A (TAPP Hernia repair)		Group B (Lichtenstein hernia repair)	
	Number of patients	Percentage	Number of patients	Percentage
1-2	3	6.00%	0	0.00%
3-4	47	94.00%	47	94.00%
5-6	0	0.00%	03	06.00%

Table 14: Mean duration of hospital stay (in days) in study group

Parameters	Number of patients		p value
	Group A (TAPP Hernia repair)	Group B (Lichtenstein hernia repair)	
Mean+SD	2.94±0.239	3.46±0.613	0.0001

DISCUSSION

In our study the overall complication rate was more frequent in the open hernia repair group than in the TAPP group. As such, no visceral injury occurred in our study during the laparoscopic procedure. All laparoscopic procedures completed without conversion to open procedure.

In our comparison of postoperative complications between the laparoscopic repair group (TAPP) and open repair group (Lichtenstein repair), the laparoscopic procedure resulted in lesser post operative pain & lower incidence rates of wound infection (0%) in laparoscopic group as compared to 6.00% in open repair group.

Pain score:

A prospective randomized study comparing laparoscopic trans abdominal pre peritoneal (TAPP) versus Lichtenstein repair for bilateral inguinal hernias" Am J Surg 2018 Jul (Lelpe B et al)⁵; Results obtained in comparative study done in the past like-“ Sixty-one patients underwent TAPP repair and 73 underwent OLR(Open Lichtenstein Repair). TAPP procedure had less early post-operative pain up to 7 days from surgery (p = 0.003, less postoperative complications (p = 0.012) and less chronic pain (0.04) when compared with the OLR (Open Lichtenstein Repair) approach. Sixty-one patients underwent TAPP repair and 73 underwent OLR (Open Lichtenstein Repair). TAPP procedure had less early post-operative pain up to 7 days from surgery (p = 0.003), a shorter length of hospital stay (p = 0.001), less postoperative complications (p = 0.012) and less chronic pain (0.04) when compared with the OLR approach.

Comparison of postoperative short-term complications after laparoscopic trans abdominal pre peritoneal (TAPP) versus Lichtenstein tension free inguinal hernia repair: a randomized trial study. Minerva Chi 2015 Apr (Kargar S et al)⁶. “The TAPP group patients significantly had experienced less postoperative pain than the Lichtenstein group in all moments (P<0.05).

In our study the mean of VAS for pain scoring in the 1st 24 hrs after surgery was 2.06 ± 0.239 in the laparoscopic group & 3.08 ± 0.695 in the open hernia repair group. This difference was statistically very significant. Similarly in the next 24 hrs it was 1.38 ± 0.602 in the laparoscopic group and 2.02 ± 0.622 in open Lichtenstein hernia repair group. This difference too was statistically significant. So these findings are suggestive of the fact that acute pain is lesser in the laparoscopic repair group as compared to open Lichtenstein hernia repair group.

Chronic pain:

Arch Surg. 1997 Mar (Kozol R et al)⁷. “At 24 hours, the patients with laparoscopic hernia repair had 26% less pain by the McGill Pain Score (P = .02) and 31% less pain by the McGill Visual Analogue Scale (P = .006) than those who underwent an open hernia repair. At 48 hours the patients who underwent laparoscopic hernia repair had 28% less pain by the McGill Pain Score (P = .03), 42% less pain by the McGill Visual Analogue Scale (P=.007)”—A prospective, randomized study of open vs laparoscopic inguinal hernia repair.

Eklund et al⁸, (2010) Br. J. Surg. Koninger et al., (2004) Langenbecks Arch Surg studies comparing modified Kugel repair or Ughary repair(both anterior pre peritoneal repairs) with laparoscopic repair are not there in the literature. Moreover, the incidence of chronic groin pain is lesser in anterior pre peritoneal repairs(modified Kugel and Ughary repairs) as compared to other open methods of hernia repair, which holds true in our case as well (1.67% vs 36% in Shouldice and 31% in Lichtenstein).

Li J et al⁹, Surg Today 2008“Only one patient complained of mild discomfort in the inguinal area after 6 months..”— Early experience of performing a modified Kugel hernia repair with local anesthesia.

Several reasons for chronic groin pain (defined as pain in the post operative period persisting for more than six months) have been suggested.

Koninger et al¹⁰, concluded that the incidence of post-operative groin pain differed according to the type of surgical approach but the presence of a prosthetic mesh was not the source of long-term chronic pain. Groin dissection via an open anterior approach is liable to cause more trauma to the peripheral nerves & scarring of the abdominal wall, whereas laparoscopic procedure avoids such risk.

In our study only 5 patients developed chronic groin pain in the Open Lichtenstein group (incidence of 10%) and 3 of the patients developed chronic groin pain in the laparoscopic group (6% incidence) over a follow up period of twelve months. This difference is statistically insignificant at p<0.001. Although there have been similar studies done in the past showing that the incidence of chronic groin pain is lesser in the laparoscopic group as compared to open group (Lichtenstein).

Wound infection:

Li J, et al⁹ Surg Endosc. 2013 Comparison of open and laparoscopic preperitoneal repair of groin hernia. The overall complication rate was lower for the laparoscopic than the open approach (14.47 vs. 19.25%, p = 0.012), whereas the rates of life-threatening complications were similar (1.51 vs. 0.98%, p = 0.332). The laparoscopic group had significantly lower incidence rates of wound infection and chronic pain (p = 0.016 and p < 0.001, respectively), shorter operative time, lower visual analogue scale scores, and faster recovery than the open group (p<0.001).

In our study the infection rate was a bit higher in the Open Lichtenstein group (6%) as compared to none(0.00%) in the laparoscopic group.

Operating Time:

Deepraj s Bhandarkar et al¹¹, Minimal Access surgery 2006 sept; The average time taken for TAPP/ TEP (65.7 min) was significantly longer than that for the Lichtenstein repair (55.5 min). A comparison with the non-Lichtenstein open mesh techniques also showed that the operating times were significantly longer for the laparoscopic operations.

The mean operative time was 92.25 minutes for laparoscopic hernia repair and 43.5 minutes for Open Lichtenstein's hernia repair, which was extremely significant. The overall mean operative time was significantly more in laparoscopic hernia repair than open repair. Operating times of surgical techniques varies between surgeons and also vary considerably between centres. International Surgery Journal Murthy PK et al¹².

According to our study, besides less pain & a lower incidence of wound infection, other significant advantages of the laparoscopic procedure were earlier recovery, shorter post-op stay. Only the operative time was a bit longer in the laparoscopic group. The duration of surgery in minutes was 35.52±3.412 (mean) in the laparoscopic group and 27.20±3.371 (mean) (P value 0.0001) in the Open Lichtenstein group.

Hospital stay:

Study by Li et al¹³, 2013 (Springer)-“ the operative time and length of postoperative stay in the laparoscopic group were shorter than those in the open group (33.84 ± 20.75 vs. 67.52 ± 39.25 min and 1.83 ± 1.59 vs. 4.03 ± 2.49 days, respectively; p\0.001).

Umme Salma et al¹⁴ in 2015 “ The mean length of hospital stay was slightly less (35.10 hrs) in open lichtenstein as compared to TAPP(38.70 hrs).

A Comparative Study between Laparoscopic Hernia Repair and Open Lichtenstein Mesh Repair Arth H Shah et al¹⁵ 2017 bjmmr 32834 ; The mean length of the hospital was found to be 3.23 days for the open hernioplasty. Compared to the laparoscopic hernia group, which was around 3.5 days but the p-value is insignificant.

In our study the mean duration of stay (in days) postoperatively in the hospital was 2.94±0.239 in the laparoscopic group as compared to 3.46±0.613 in the Open Lichtenstein group(p<0.0001).

CONCLUSION

- My study demonstrated that the Open Lichtenstein & laparoscopic procedure (TAPP) both are effective & safe for groin hernia repair.
- The operating time is little longer in the laparoscopic procedure in comparison to open Lichtenstein repair.
- The post operative pain and complications (Seroma , Hematoma , Wound infection) are less in laparoscopic procedure in comparison to open Lichtenstein procedure.
- There is less hospital stay is in laparoscopic procedure in comparison to open Lichtenstein procedure.
- There were no life threatening complications over a period of 12 month follow-up in both the groups.

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