

# A Comparative Study of Laparoscopic Inguinal Hernioplasty with Open Inguinal Hernioplasty

Ashok Koirala, Sachidanand Shah, Dinesh Adhikari, Amit Bhattarai, Ajay Kumar Yadav

Department of General and Minimally Invasive Surgery, NMCTH, Biratnagar, Nepal.

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## Correspondence

Ashok Koirala  
Associate Professor,  
Department of Surgery Noble Medical  
College, Biratnagar, Nepal.  
Email: akoirala97@yahoo.com

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## Abstract

**Introduction:** Inguinal hernia repair is most common surgical procedures done worldwide. It is repaired by both laparoscopic and open technique. The aim of this study is to compare the outcome of laparoscopic inguinal hernioplasty with open inguinal hernioplasty.

**Methods:** A retrospective comparative study was done from May 2019 to July 2020. 60 patients enrolled in the study, 30 underwent Laparoscopic hernia repair (LH) and another 30 underwent Lichtenstein's hernioplasty (OH). These two groups were compared for operative time, postoperative pain, length of hospital stay, surgical site infections and postoperative scar.

**Results:** Out of 60 patients, right sided inguinal hernia was found in 34 (56.66%), left sided inguinal hernia in 24 (40%) and bilateral inguinal hernia in 2 (3.33%). Mean operative time in LH group was  $122 \pm 13.77$  minutes whereas in OH group it was  $55.59 \pm 8.53$  [ $p < 0.01$ ]. Mean postoperative pain at 8 hours in LH was  $4.44 \pm 1.87$  and in OH was  $6.43 \pm 0.93$  [ $p < 0.01$ ]. At first postoperative day pain in LH was  $3.46 \pm 1.38$  and in OH was  $5.76 \pm 1.0$  [ $p < 0.01$ ]. At second postoperative day pain in LH was  $3.09 \pm 1.12$  and in OH was  $4.43 \pm 0.81$  [ $p < 0.01$ ]. Mean duration of hospital stay in LH group was  $2.13 \pm 0.34$  whereas in OH group  $2.70 \pm 0.46$  [ $p < 0.01$ ]. No surgical site infections noted in LH group whereas 2 developed superficial surgical site infections in OH group ( $P = 0.155$ ). In 2 weeks and subsequent follow up period of 3 months, scar look cosmetically better in LH group.

**Conclusion:** Laparoscopic hernia repair was associated with less postoperative pain, shorter hospital stay, less surgical site infections, with better cosmesis but prolonged operative time.

**Keywords:** Laparoscopic hernioplasty, inguinal hernia, open hernioplasty

## Introduction

Inguinal hernia repair is commonest surgical procedure worldwide. Initially it was pure tissues repair followed by synthetic mesh placement. Synthetic mesh can be placed by laparoscopic technique as well as open technique. Laparoscopic hernioplasty was first reported in 1990 by Ger and Colleagues<sup>1</sup>. Since then several studies had shown the benefits of laparoscopic hernioplasty in terms of less postoperative pain, less surgical site infections, early resumption of works and activities, better cosmesis<sup>2,3,4</sup>. Open technique of mesh placement is best achieved by Lichtenstein's repair where recurrence rate is less than 1%, however in tissues repair recurrences may be up to 15%<sup>5,6</sup>.

In our hospital, both laparoscopic and open technique for hernia repair was regularly performed. Therefore, the aim of this study was to compare the

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outcomes between these two procedures.

## Methods

A retrospective comparative study was conducted in the patients, diagnosed as inguinal hernia that underwent laparoscopic as well as open hernioplasty. Patients admitted through Out Patient Department of surgery of Nobel Medical College and Teaching Hospital, Biratnagar from May 2019 to July 2020 was enrolled in the study after taking ethical clearance from Institutional Review Committee. Written informed consent was taken from all patients. The diagnosis of inguinal hernia was made on the basis of history and clinical examinations.

A total 60 patients were included in the study of which 30 underwent totally extra preperitoneal repair (TEPP) and another 30 were operated with open tension free Lichtenstein's hernioplasty. Patients with complicated hernia (obstructed, strangulated), hernia associated with hydrocele/varicocele, cirrhosis and coagulations disorder, jaundice, any psychiatric illness, medical illness like chronic obstructive airway disease, ischemic heart disease were excluded from the study.

General anesthesia was used for TEPP and spinal anesthesia was used for open hernioplasty. Preoperatively injection ceftriaxone 1gm intravenously was given to all patients and continued for first post-operative day. Injection ketorolac 30 mg 8 hourly was given after surgery and switched to oral NSAID

**Table 1:** Distribution of patients according to age groups

Age in years	Laparoscopic group(LH)	Open group(OH)	Total	
11-20	2	4	6(10%)	
21-30	4	1	5(8.33%)	
31-40	5	2	7(11.66%)	
41-50	4	5	9(15%)	
51-60	9	7	16(26.66%)	Total-29
61-70	6	7	13(21.66%)	(48.32%)
71-80	.....	2	2(3.33%)	
81-90	.....	2	2(3.33%)	
Total	30	30	60(100%)	

Out of 60 patients, 34 patients had right sided inguinal hernia, 24 had left sided inguinal hernia and 2 had bilateral inguinal hernia as shown in Table: 2

**Table 2:** Site of inguinal hernia

Site	LH group	OH group	Total
Right	19	15	34(56.66%)
Left	11	13	24(40%)
Bilateral	.....	2	2(3.33%)
Total	30	30	60(100%)

The mean operative time in LH was  $122 \pm 13.77$  minutes where as in OH it was  $55.59 \pm 8.53$  minutes which were significantly lower and statistically significant as shown in Table 3.

on first postoperative day. Patients were discharged once vitals stable, tolerated normal diet and pain well controlled. Patients were asked to follow up in OPD after 2 weeks. At this time, staples removal and wound inspection was done. Further patients were asked to follow up till 3 months.

The parameters studied were demographic data of the patients, operative time, post-operative pain (rated based on Numeric Pain Rating Scale [NPRS] of 0 to 10 with higher score indicating more severe pain and lower score indicating less severe pain) noted at 8 hours, on day 1 and day 2, Length of hospital stay, surgical site infections (defined as redness, purulent or seropurulent discharge from wound site) and scar assessment.

**Statistical analysis:** All data were collected and statistical analysis was done using SPSS version 25. A p-value of  $<0.05$  was considered statistically significant.

## Results

Total 60 patients underwent hernioplasty, 30 patients by laparoscopic method (TEPP) of which 3(10%) needed conversion to open method due to peritoneal breach and another 30 patients by open method (OH). Age range of the patients was 18-86 years and all were male patients with maximum number of patients in the age group between 51-70 years (48.32%) as shown in Table 1.

**Table 3:** Comparisons of operative time between LH and OH group

Mean operative time in (minutes)	LH group	OH group	p-value
	$122 \pm 13.77$	$55.59 \pm 8.53$	$<0.01$

After hernia repair, patients were analysed for postoperative pain at 8 hours, first postoperative day and second postoperative day using Numeric Pain Rating Scale (NPRS) which showed less postoperative pain in LH repair as shown in Table 4.

**Table 4:** Comparisons of postoperative pain between LH and OH group

Postoperative NPRS	LH group	OH group	p-value
At 8 hours	4.44±1.87	6.43±0.93	<0.01
1 <sup>st</sup> postoperative day	3.46±1.38	5.76±1.0	<0.01
2 <sup>nd</sup> postoperative day	3.09±1.12	4.43±0.81	<0.01

Mean duration of hospital stay of patients in LH group was 2.13±0.34 where as in OH group it was 2.70±0.46 which was statistically significant as shown in Table 5.

**Table 5:** Comparisons of hospital stay between LH and OH group

Duration of hospital stay(days)	LH group	OH group	p-value
	2.13±0.34	2.70±0.46	<0.01

There was no wound infection in LH group where as 2 patients developed superficial surgical site infection in OH group as shown in Table 6.

**Table 6:** Comparisons of wound infections between LH and OH group

Wound infections between LH and OH group	LH group	OH group	p-value
	0/30	2/30	0.155

Patients were followed after 2 weeks till 3 months period following hernia repair. Scar looked cosmetically better in LH repair compared to OH repair.

## Discussion

This study was conducted to know the surgical outcomes between laparoscopic and open hernia repair. In the present study no major complications were observed intra operatively as well as postoperatively in both procedures, however peritoneal breaching occurred in 3(10%) cases in TEPP repair which needed conversion to open repair. Similar observations mentioned by the study conducted by Chetan et al and Ramshaw et al<sup>7,8</sup>.

Age range of the patients in our study was 18-86 years with maximum number of patients were in between 50-70 years (48.32%). The study conducted by Sultan et al too mentioned peak incidence of hernia above 50 years of age<sup>9</sup>. Right sided inguinal hernia was 34(56.66%) whereas left sided inguinal hernia was 24(40%) in our study. Incidence of right sided inguinal hernia was more common compared to left was mentioned in the study conducted by Saeed et al, Alam et al<sup>10,11</sup>. Right sided predominance is because of later descent of right testis compared to left testis<sup>12</sup>.

The operative time in LH group was significantly higher compared to open group with ( $p < 0.01$ ) in our study. The study conducted by Bring Man et al and Go PM too showed higher operative time in laparoscopic group<sup>13,14</sup>. The meta-analysis published in British Journal of Surgery mentioned 15.2 minutes higher time taken for laparoscopic inguinal hernia repair with ( $p < 0.001$ )<sup>15</sup>. However, the time taken in our study was much higher compared to above mentioned study because we were new to this technique and was early

learning curve.

The postoperative pain was analysed using Numeric Pain Rating Scale (NPRS) at 8 hours, on first postoperative day and second post-operative day as shown in Table 4 in which pain was significantly lower in LH group compared to OH group. Less pain was found in LH group which may be due to less tissues trauma, less handling of cord structures with fewer dissections. This was comparable with the study conducted by Fujita et al, Winslow et al and Pokorny et al<sup>16, 17, 18</sup>.

Mean duration of Hospital stay in LH group was 2.13±0.34 whereas in OH group it was 2.70±0.46 ( $p < 0.01$ ) which was statistically significant. The longer duration of hospital stay in OH group was due to complaints of pain by the patient in this study. The study conducted by Colak et al too mentioned shorter hospital stay in laparoscopic group which was comparable with our study<sup>4</sup>. However, Cochrane review stated that there was no difference in hospital stay between laparoscopic and open groups<sup>19</sup>.

The wound infection was seen in OH group, but was not statistically significant as shown in Table 6. This was comparable with the study conducted by Winslow et al<sup>17</sup>. Patients were followed at second week after the operation. At that time, suture removal and wound inspection was done. Again patients were asked to follow up till 3 months period. The patients of LH group had cosmetically better scar compared with longer scar of OH group on naked eye inspection. Fujita et al and Savarise et al too mentioned that Laparoscopic TEPP had better cosmetic results<sup>16, 19</sup>.

## Conclusion

Laparoscopic hernia repair is better in terms of less postoperative pain, shorter hospital stay, less chance of surgical site infections with cosmetically better scar. There were some limitations of this study which should be considered for future as the study was conducted with small sample size in a single center.

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