

## **Surgical Management of Bilateral Inguinal Hernia: A Prospective Randomized Comparative Study**

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Received: 13-01-2022 / Revised: 17-02-2022 / Accepted: 19-03-2022

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Conflict of interest: Nil

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### **Abstract**

**Aim:** A comparative study of Stoppa's repair versus Lichtenstein technique for surgical management of bilateral inguinal hernia.

**Methods:** This prospective, open, randomized, comparative study was carried out in the Department of General Surgery, Jannayak Karpooori Thakur Medical College and Hospital Madhepura, Bihar, India, India. Patients were randomised into two groups based on simple randomization-group 1: patients underwent Lichtenstein tension free mesh hernioplasty; and group 2: patient underwent Stoppa's repair. Age, chief complaints and duration of inguinal hernia, other concomitant conditions such as chronic cough, chronic constipation, urinary complaints, etc., history of previous abdominal surgeries, family history, occupation, marital status, and etc. were all taken into account. A thorough physical examination was also carried out. Total 50 patients-25 patients in each group-were included in the study who were fulfilled the selection criteria.

**Results:** The present study has included 50 patients with bilateral inguinal hernia, meeting the selection criteria. The patients were randomly assigned to one of two groups in this study. In group 1, 25 patients underwent bilateral Lichtenstein tension-free hernioplasty, while group 2 underwent Stoppa repair. As per preoperative variables-age, BMI, comorbidities, and smoking did not show a statistically significant difference between the two groups. The operative time was significantly shorter in group 2 patients ( $44.33 \pm 6.23$  min), whereas it was  $79.54 \pm 7.51$  min in group A. In both groups, there were no intraoperative complications. Group 2 patients had significantly lower postoperative pain scores measured by the visual analogue scale at 12 hours postoperatively, but there was no statistically significant difference in pain at 24 hours or 7

days postoperatively. In terms of postoperative complications, postoperative hospital stays, return to normal daily activities, and chronic groin pain, there was no statistically significant difference between the two groups.

**Conclusion:** Both procedures were capable of achieving favourable post-operative outcomes and had similar problems. The time it took for all groups to return to normal activity and work without pain was longer, most likely because the hernia procedures were bilateral.

**Keywords:** hernia, Stoppa's repair, Lichtenstein technique

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## Introduction

It has been said that the history of groin hernias is the history of surgery itself. [1] Hernia repair is one of the most commonly performed general surgical procedures worldwide. [2] Since the time Bassini described his technique the search for an Ideal Inguinal Hernia repair is still on. An Ideal Hernia repair should be Tension free, Tissue based, with no potential damage to vital structures, no Long Term pain or complications and no recurrence. Lichtenstein's prosthetic repair using prolene mesh has been popular lately & it is a tension free repair. The mesh works as a mechanical barrier, but it does not give mobility and physiologically dynamic posterior wall. [3] Moreover this technique is associated with risk of infections, recurrence, chronic pain testicular atrophy and infertility, foreign body sensations and chronic groin sepsis which sometimes may require mesh removal. [4] Other tissue repairs like such as modified Bassini, Iliotibial tract repair, Should ice, Nylon-Darn, Halsted-Tanner, McVay and many others either requires good surgical experience or are tension repairs fraught with recurrences. Recurrences vary from surgeon to surgeon and centre to centre owing to complexity of the procedures. [5] The Stoppa's Repair first described in 1975 by Rene Stoppa, also known as giant prosthetic reinforcement of the visceral sac (GPRVS), is a tension free type of hernia repair, which is performed by wrapping the lower part of the parietal peritoneum with prosthetic mesh and placing it at a preperitoneal level through pfannensteil incision. [6] This technique has met particular success in the repair of bilateral hernias, large scrotal hernias, and recurrent hernias in which conventional repair is difficult and carries a high morbidity and failure rate. [7-9]

This new technique is theoretically closer to ideal hernia repair and based on the concept of providing a strong, mobile and physiologically dynamic posterior inguinal

wall. The technique is simple, easy to learn and does not require complicated dissection or suturing.

## Material and methods

This prospective, open, randomized, comparative study was carried out in the Department of General Surgery, Jannayak Karpoori Thakur Medical College and Hospital Madhepura, Bihar, India, India from November 2020 to October 2021

## Inclusion criteria

This study included 50 patients of both genders with age of 18 years and above visiting the department of general surgery of the institute with bilateral inguinal hernias.

## Exclusion criteria

Patients with following any condition-a complicated inguinal hernia; an obstructed or strangulated inguinal hernia; a recurrent inguinal hernia; previous abdominal surgery; a local skin infection-were excluded from the study.

## Methodology

Patients were randomised into two groups based on simple randomization-group 1: patients underwent Lichtenstein tension free mesh hernioplasty; and group 2: patient underwent Stoppa's repair. Age, chief complaints and duration of inguinal hernia, other concomitant conditions such as chronic cough, chronic constipation, urinary complaints, etc., history of previous abdominal surgeries, family history, occupation, marital status, and etc. were all taken into account. A thorough physical examination was also carried out. Total 50 patients-25 patients in each group-were included in the study who were fulfilled the selection criteria. In Lichtenstein tension-free hernioplasty, a skin incision was made parallel to the inguinal ligament from about 1/2 inch above and lateral to the pubic tubercle to about 1/2 inch below and medial to the

anterior superior iliac spine.[10] Vicryl 0. was used to dissect the indirect hernia sac, ligate it, and section it. Vicryl 2/0 was used to plicate and invaginate the large direct sacs. In all cases, a 6x11 cm heavy prolene mesh was used. Using interrupted polypropylene 2/0, the mesh was secured in place. Starting from the pubic tubercle and extending beyond the orifice of the internal ring, the mesh was fixed to the inguinal ligament and conjoint tendon. In another group, Stoppa procedure which was developed by Stoppa was used, with some modifications. [11-14] The standard incision for all patients was a Pfannenstiel incision, followed by vertical separation of both recti to enter the preperitoneal space. The preperitoneal space was dissected with a blunt dissection. Retzius' retro pubic space was dissected, and the rectus abdominis muscle and epigastric vessels were reached laterally, extending to the retro inguinal space. It was possible to see the spermatic cord and gonadal vessels. The iliac vessels, the superior pubic ramus, and the obturator foramen were all exposed. The presence of direct hernias was discovered and the size of the hernias was reduced. Large sacs were removed and a purse-string suture was used to bind them. The distal peritoneum was left attached to the cord, the indirect sacs were divided, and the proximal peritoneum was sutured. If the indirect hernia was sliding, the sac was separated from the cord structures. Dissection of the spermatic cord and gonadal vessels' peritoneal attachment was used to partialize them. In the preperitoneal space, a prolene mesh (polypropylene nonabsorbable synthetic mesh; single (60×60 cm) or two (30×30 cm) was placed. The mesh did not need to be fixed because the intraabdominal pressure forces it to lay flat between the peritoneum and fascial layers.

Each patient's operative data was recorded in case record form, with a focus on operative time and intraoperative complications. Assessment of

postoperative pain, postoperative complications, hospital stay, time to return to normal daily activities, chronic groin pain, and recurrence were all included in the postoperative data collection. The visual analogue scale was used to assess postoperative pain in each patient at 12 hours, 24 hours, and 7 days after surgery. After the operation, all patients were monitored for one month to assess complications, pain, return to normal daily activities, chronic groin pain, and recurrence.

The statistical package for the social sciences, version 25.0 software (SPSS v.25.0) was used to conduct the analysis.  $P=0.05$  was considered as the significance level. Number and percent were used to describe qualitative data. Range, mean, SD, and median were used to describe quantitative data. The  $\chi^2$ -test was used to compare different groups in terms of categorical variables.

## Results

The present study has included 50 patients with bilateral inguinal hernia, meeting the selection criteria. The patients were randomly assigned to one of two groups in this study. In group 1, 25 patients underwent bilateral Lichtenstein tension-free hernioplasty, while group 2 underwent Stoppa repair. As per preoperative variables-age, BMI, comorbidities, and smoking did not show a statistically significant difference between the two groups. As shown in Table 2, the operative time was significantly shorter in group 2 patients ( $44.33\pm 6.23$  min), whereas it was  $79.54\pm 7.51$  min in group A. In both groups, there were no intraoperative complications. Group 2 patients had significantly lower postoperative pain scores measured by the visual analogue scale at 12 hours postoperatively, but there was no statistically significant difference in pain at 24 hours or 7 days postoperatively (Table 3). In terms of postoperative complications, postoperative

hospital stays, return to normal daily activities, and chronic groin pain, there was no statistically significant difference between the two groups.

**Table 1: demographic profile of the patients**

Characteristics		Group 1	Group 2	P value
Age (years); Mean $\pm$ SD		46.89 $\pm$ 9.20	49.45 $\pm$ 10.78	0.58
Male/Female		20/5	21/4	0.57
BMI (kg/m <sup>2</sup> ); Mean $\pm$ SD		29.50 $\pm$ 4.43	30.97 $\pm$ 3.66	0.62
Co- morbidities	Hypertension	4	3	0.77
	Diabetes	5	5	
	COPD	6	7	
Smoking		8	7	0.66

**Table 2: Operative and postoperative parameters of the patients, (n=15).**

Variables		Group 1	Group 2	P value
Operation time (min); Mean $\pm$ SD		79.54 $\pm$ 7.51	44.33 $\pm$ 6.23	<0.001
Post-op complications	Wound hematoma	4	3	0.41
	Urine retention	2	2	
	Wound infection	1	0	
	Scrotal hematoma	1	1	
	Groin pain	14	15	
Post-op hospital stays (days); Mean $\pm$ SD		1.17 $\pm$ 0.39	1.14 $\pm$ 0.31	0.68
Return to work (days); Mean $\pm$ SD		19.34 $\pm$ 2.01	20.05 $\pm$ 2.80	0.82

**Table 3: Comparison of post-operative pain in both groups**

Groups	Post-operative pain		
	12 hours	24 hours	7 days
Group 1; Mean $\pm$ SD	8.23 $\pm$ 1.66	5.80 $\pm$ 1.77	1.98 $\pm$ 1.19
Group 2; Mean $\pm$ SD	7.16 $\pm$ 1.18	5.57 $\pm$ 1.34	1.67 $\pm$ 0.97
P value	0.027*	0.67	0.87

## Discussion

Bilateral inguinal hernia repair has long been considered a two-stage procedure, with simultaneous repair discouraged. For the repair of bilateral hernias, Stoppa described his midline preperitoneal approach. [13] Bilateral hernias should be repaired at the same time rather than sequentially, according to research. [15, 16] Amid et al later advocated using the

Lichtenstein technique for simultaneous repair of bilateral hernias under local anaesthesia. [17] Fischer et al provided excellent documentation of the feasibility and tolerability of repairing bilateral inguinal hernias at the same time. [18] We have tried to investigate the benefits and drawbacks of two open, tension-free mesh techniques for the repair of bilateral inguinal hernias in this study. Malazgirt et al studied 45 patients with bilateral inguinal hernias-22 patients underwent Stoppa procedures and 23 patients

underwent bilateral Lichtenstein procedures and found that Stoppa procedures took significantly less time than bilateral Lichtenstein procedures. [19] Stoppa repair was done under spinal anaesthesia, and Lichtenstein repair was done under spinal or local anaesthesia. To avoid any bias in postoperative pain scoring, all procedures were performed under spinal anaesthesia in this study. In terms of operative time, our results were comparable to those of Malazgirt et al as the Stoppa procedure took significantly less time than bilateral repair. The mean operational time for Stoppa repair was  $39.0 \pm 5.15$  minutes in research by Talha et al which is about 10 minutes shorter than what Stoppa and colleagues reported since Stoppa and colleagues concentrated their investigation on difficult and recurrent hernias, which we eliminated from our study. [20]

In our investigation, there was no significant difference in postoperative hospital stay between the two groups, which was consistent with Malazgirt et al findings. [19] For bilateral Lichtenstein repair, Maciel et al found a mean postoperative hospital stay of  $1.55 \pm 0.83$  days (most of their patients were admitted for 1 day). [21] For bilateral Lichtenstein repair, Miller et al reported a mean hospital stay of 6.4 days, and Serpell et al reported a hospital stay ranging from 2 to 12 days. [15, 16] In these two investigations, we were unable to provide an adequate reason for the relatively protracted postoperative hospital stay following bilateral Lichtenstein repair. The length of stay in the hospital after bilateral Lichtenstein surgery was similar to that reported in the literature. [22] During their study in 2003, Fernandez-Lobato et al. found that the average postoperative hospital stay following Stoppa repair was 1.2 days; this result was also similar to the present study. [23]

Li et al carried out a meta-analysis. The results of 2860 patients enrolled in 10

randomized controlled trials and two comparative studies for comparison between preperitoneal and Lichtenstein repair for unilateral inguinal hernia were pooled in this meta-analysis, which found no significant difference in postoperative complications between the 2 groups. [24] According to Malazgirt et al and Talha et al there was no significant difference in the incidence of postoperative complications between bilateral Lichtenstein repair and Stoppa repair. [19,20] Our findings were analogous to all these three studies, since we also found no significant differences in postoperative complications between the two groups. [25]

In this study, there was no significant difference in the return to normal daily activities between the two groups. In this study, the Stoppa surgery had considerably lower postoperative pain scores at 12 hours than bilateral Lichtenstein repair, however there was no significant difference in pain scores at 24 hours or 7 days postoperatively. Similar type of findings was also observed in a study done by Talha et al. [20]

### Conclusion:

Both procedures were capable of achieving favourable post-operative outcomes and had similar problems. The operative time was significantly shorter in stoppa's repair. The time it took for all groups to return to normal activity and work without pain was longer, most likely because the hernia procedures were bilateral.

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