

Surgical Therapy of Bilateral Inguinal Hernias: a Comparison between Lichtenstein's Approach and Stoppa's Repair

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Abstract

Aim: This research aimed to compare the efficacy of surgical techniques, Lichtenstein tension-free mesh hernioplasty, and Stoppa's repair in the treatment of bilateral inguinal hernias.

Method: Sixty patients were taken, all aged 18 years or older, and diagnosed with bilateral inguinal hernias. The participants were randomly divided into two groups. Group 1 consisted of 30 patients who received Lichtenstein tension-free hernioplasty, whereas Group 2 consisted of 30 patients who underwent Stoppa repair. The preoperative variables, like age, main symptoms, and duration of hernia, were similar between groups. Spinal anesthesia was performed for all patients and a prophylactic dose of 2 g ceftriaxone was given preoperatively for all patients. The operative time; postoperative pain at 12 and 24 hours and 7 days; complications; hospital stay; and recovery at 7 days and 1, 6, and 12 months were assessed.

Results: The operative time was similar when both groups were compared. The postoperative complications such as wound hematoma, urine retention, scrotal hematoma, and groin pain were also similar in both groups. Regarding postoperative pain, the level was significantly low in the Stoppa group compared to the Lichtenstein group at 12 hours, 24 hours, and 7 days post-operation. The length of stay in the hospital and the time to return to work were similar in both groups.

Conclusion: The Stoppa repair was associated with less postoperative pain as compared to the Lichtenstein repair. However, both techniques had similar operative times, complications, and recovery. Proper selection of the surgical technique can considerably improve the comfort and rapid recovery of the patients. The Stoppa procedure has an edge over others regarding postoperative pain.

Keywords: Anesthesia, Groin, Hernioplasty, Lichtenstein repair, Stoppa procedure

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Introduction

Inguinal hernias often need a referral for surgery in primary care patients. The historical and physical examination often provide enough information to establish the diagnosis. Patients with symptoms frequently report experiencing severe pain in the groin region [1]. Inguinal hernias may result in a sense of burning, gurgling, or hurting in the groin area. Additionally, there may be a feeling of heaviness or dragging that intensifies as the day progresses and after extended periods of physical activity. The presence of an abdominal bulge may resolve when the patient assumes a prone posture, an abdominal bulge may resolve. The examination entails palpating for protrusion or pulsation while the patient coughs or exerts pressure [2]. While

imaging is not often necessary, ultrasonography or magnetic resonance imaging may be useful in diagnosing a hernia in an athlete who does not have a detectable impulse or bulge during a physical examination. When the diagnosis of a recurrent hernia or suspected hydrocele is unclear or there are surgical issues, researchers recommend ultrasonography. Surgery treats the majority of hernias, but it's not always necessary, especially for small hernias with limited symptoms. If repair is necessary, the patient should receive counseling to determine the best option between an open or laparoscopic approach. It is rare for surgical complications and hernia recurrences to occur. If

feasible, it is advisable to send a patient with a recurring hernia to the first surgeon.

An inguinal hernia is a challenging surgical condition to cure due to its high occurrence, intricate nature, and significant economic impact. The likelihood of an individual requiring an inguinal hernia surgery at some point in their life is rather significant, with males having a 27 percent probability and women having a 3 percent probability. Surgery is the restricted method for treating and resolving an inguinal hernia. There have been no documented cases of adults healing spontaneously. Despite several attempts at different surgical methods to address inguinal hernia, recurrences remain predictable. After a thorough examination of the inguinal area's anatomy, it became possible to make an informed decision on the most suitable surgical method to achieve superior surgical outcomes. Bilateral hernia is a distinct type of inguinal hernia. In the present time, surgeons fix both sides of a bilateral inguinal hernia at the same time during surgery, using the transverse or pre-peritoneal fascia for mesh placement while both sides are under general anesthesia. The Stoppa procedure implants a large pre-peritoneal prosthesis via a midline incision below the belly button. The techniques of Stoppa et al., [3] Nyhus et al., [4] and McVay [5] and Anson were combined for laparoscopic hernia repair. To perform the Stoppa's repair, which is a tension-free hernia repair, the prosthetic mesh is wrapped around the lower part of the parietal peritoneum and placed at a preperitoneal level through a Pfannenstiel incision. It has been particularly effective in managing bilateral hernias, large scrotal hernias, and recurrent hernias, which are notoriously difficult to repair and have a high complication and failure rate [6].

The "tension-free" hernioplasty was first described in 1989 and gained widespread adoption due to its safety, ease of learning, and low recurrence rates. Lichtenstein used a tension-free mesh reinforcement in hernia repairs. Postoperative pain and persistent postoperative pain syndromes continue to plague inguinal hernia repair [7]. Increasing reports indicate the use of glues in inguinal hernia repair. In his pilot study, Canonico demonstrated the efficacy of adhesive in mesh fixing and suggested the possibility of a sutureless Lichtenstein operation. The purpose of this research paper is to compare Lichtenstein and Stoppa's surgical approaches in the treatment of bilateral inguinal hernias [8].

Materials and Methods:

Study Design

A prospective, open, randomized, comparative study was undertaken at Department of Surgery, RDJM Medical College and Hospital, Turki, Muzaffarpur, Bihar, India for 12 months. Informed written consent was obtained from all patients.

Sample size

The study consisted of 60 patients of both genders aged 18 years and above visiting the Department of General Surgery of the institute with bilateral inguinal hernias.

Selection criteria

Inclusion criteria

- Patients have not undergone prior inguinal hernia surgery.
- The study included patients who provided written informed consent to participate.
- Patients were cleared for general anesthesia without contraindications.
- Only elective (non-emergency) hernia repair cases are included.

Exclusion criteria:

- Patients with a complicated inguinal hernia.
- The patients suffer from an obstructed or strangulated inguinal hernia.
- Patients with recurring inguinal hernias.
- Patients with a previous abdominal surgery.
- Patients with a local skin infection.

Procedure

The patients were randomly assigned to two groups using simple randomization. Group 1 consisted of patients who received Lichtenstein tension-free mesh hernioplasty, whereas Group 2 consisted of patients who underwent Stoppa's repair. The patient's age, main symptoms, and length of the inguinal hernia, as well as any other accompanying problems such as chronic cough, chronic constipation, urinary complaints, etc., were carefully considered. Additionally, the patient's history of prior abdominal operations, family medical history, occupation, and marital status were also taken into consideration. Additionally, a comprehensive physical examination was conducted. The research included 60 patients, with 30 in each group who met the selection criteria.

Surgical technique

All patients consistently received spinal anesthesia. Each patient received a dose of 2 grams of ceftriaxone before surgery.

Lichtenstein tension-free hernioplasty: It involves making an incision through the skin parallel to the inguinal ligament, starting about 1/2 inch above and to the side of the pubic tubercle, and ending just below and toward the inside of the anterior superior iliac spine. The indirect hernia sac was separated and ligated and then divided with Vicryl 0. These large sacs were folded inward and creased using Vicryl 2/0, a brand of sutures made by Ethicon, an affiliate of Johnson & Johnson International. In all instances, a large prolene mesh measuring 6 × 11 cm (PMH,

prolene mesh, polypropylene nonabsorbable synthetic mesh 6 × 11 cm, Ethicon; Johnson & Johnson International) was used. The mesh was secured in position with interrupted polypropylene 2/0 sutures. The mesh was securely attached to the inguinal ligament and the conjoint tendon, beginning at the pubic tubercle and continuing beyond the opening of the internal ring [9].

Stoppa Procedure: The Stoppa approach was employed but with certain modifications. A fenestral incision as the traditional approach for all patients was employed, which then followed the vertical separation of both recti muscles to gain access to the preperitoneal space. A direct and precise dissection of the preperitoneal region was carried out. The procedure for dissection started in the retropubic space of Retzius and went to the rectus abdominis muscle and epigastric arteries on the sides. It then went into the retroinguinal space. The spermatic cord and gonadal vessels were seen. The superior pubic ramus, obturator foramen, and iliac vessels were surgically exposed. Direct hernias were detected and repositioned. Significant pouches were extracted and secured with a purse-string suture. The indirect sacs were separated, the proximal peritoneum was stitched, and the distal peritoneum was retained and connected to the cord. If an indirect hernia was sliding, the surgical procedure included dissection to separate the sac from the cord components. The surgical procedure involved dissecting the peritoneal connection between the spermatic cord and gonadal arteries to achieve parietalization. A prolene mesh, specifically a polypropylene nonabsorbable synthetic mesh of 30×30 cm and manufactured by Ethicon, a subsidiary of Johnson & Johnson International, was inserted into the preperitoneal area. Mesh fixation was unnecessary due to the intra-abdominal pressure, which naturally causes the mesh to lie flat between the peritoneum and the fascial layers [10].

Postoperative Course

The surgical data of each patient were documented, with particular emphasis on the duration of the operation and any problems that occurred during the procedure. Postoperative data collection included the assessment of postoperative pain, postoperative complications, length of hospital stay, time taken to

resume regular daily activities, persistent groin discomfort, and recurrence. Postoperative pain in each patient was assessed using the visual analog scale at 12, 24 hours, and 7 days after the surgery.

Follow-up

Patients were monitored at certain intervals (7 days, 1, 6, and 12 months) after the surgery at an outpatient clinic. The purpose was to evaluate any problems, pain levels, resumption of regular daily activities, persistent groin pain, and the possibility of recurrence.

Statistical Analysis

The study was conducted using the SPSS v.20.0 program, which is a statistical tool designed for social sciences. A significant criterion of $P=0.05$ was used. Numerical and percentage values were used to describe quantitative data. The quantitative data was characterized using statistical measures such as range, mean, standard deviation (SD), and median. The χ^2 -test was used to evaluate the comparability of several groups based on categorical data.

Results

The current research has included 60 individuals who have bilateral inguinal hernia and match the specified selection criteria. In this investigation, the patients were allocated into two groups using a random assignment method. In group 1, 30 patients underwent bilateral Lichtenstein tension-free hernioplasty, while in group 2, 30 patients underwent Stoppa repair.

Table 1 shows the characteristics of patients in Group 1 and Group 2, revealing no statistically significant differences across various parameters. The average age was similar between the groups (65.4 ± 10.2 years in Group 1 and 63.7 ± 9.8 years in Group 2, $p=0.45$). Gender distribution was comparable, with 60% males in Group 1 and 67% in Group 2 ($p=0.58$). The BMI was also close between the groups (27.3 ± 4.5 kg/m² in Group 1 and 26.8 ± 4.2 kg/m² in Group 2, $p=0.28$). Additionally, comorbidities such as hypertension, diabetes, COPD, and smoking were similar between the groups, with p -values ranging from 0.12 to 0.79, indicating no significant differences in these characteristics.

Table 1: Characteristics of the Patients

Characteristics	Group 1 (n=30)	Group 2 (n=30)	P-value
Age (years); Mean ± SD	65.4 ± 10.2	63.7 ± 9.8	0.45
Gender			
Male	18 (60%)	20 (67%)	0.58
Female	12 (40%)	10 (33%)	0.58
BMI (kg/m²)	27.3 ± 4.5	26.8 ± 4.2	0.28
Co-morbidities			
Hypertension	12 (40%)	9 (30%)	0.61
Diabetes	10 (33%)	12 (40%)	0.12

COPD	8 (27%)	9 (30%)	0.79
Smoking	15 (50%)	13 (43%)	0.62

Table 2 outlines the operative and postoperative parameters of patients in Group 1 and Group 2, showing no statistically significant differences across the measured variables. The operation time was similar between the groups (85.0 ± 12.0 minutes in Group 1 and 88.5 ± 11.5 minutes in Group 2, p=0.25). Postoperative complications, including wound hematoma, urine retention, scrotal

hematoma, and groin pain, were comparable between the groups, with p-values ranging from 0.34 to 0.7. Additionally, the length of postoperative hospital stays (5.0 ± 1.0 days in Group 1 and 5.2 ± 1.1 days in Group 2, p=0.55) and the time to return to work (15.0 ± 3.0 days in Group 1 and 16.0 ± 3.2 days in Group 2, p=0.42) were not significantly different, indicating similar postoperative outcomes.

Table 2: Operative and Postoperative Parameters of the Patients

Variables	Group 1 (n=30)	Group 2 (n=30)	P-value
Operation time (min); Mean ± SD	85.0 ± 12.0	88.5 ± 11.5	0.25
Post-op complications			
Wound hematoma	4 (13%)	6 (20%)	0.48
Urine retention	3 (10%)	5 (17%)	0.7
Scrotal hematoma	2 (7%)	3 (10%)	0.64
Groin pain	8 (27%)	12 (40%)	0.34
Post-op hospital stays (days); Mean ± SD	5.0 ± 1.0	5.2 ± 1.1	0.55
Return to work (days); Mean ± SD	15.0 ± 3.0	16.0 ± 3.2	0.42

Table 3 compares post-operative pain levels between Group 1 and Group 2, showing statistically significant differences at all time points measured. At 12 hours post-operation, Group 1 reported higher pain levels (6.5 ± 1.2) compared to Group 2 (5.8 ± 1.0), with a p-value of 0.015. Similarly, at 24 hours, Group 1 had higher pain scores (4.2 ± 1.0) than

Group 2 (3.6 ± 0.9), with a p-value of 0.012. By 7 days post-operation, pain levels had decreased in both groups, but Group 1 still reported slightly higher pain (1.5 ± 0.5) compared to Group 2 (1.2 ± 0.4), with a p-value of 0.030. These findings demonstrated that Group 2 experienced significantly less post-operative pain than Group 1.

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

Post-operative Pain	Group 1 (n=30)	Group 2 (n=30)	P-value
12 hours	6.5 ± 1.2	5.8 ± 1.0	0.015
24 hours	4.2 ± 1.0	3.6 ± 0.9	0.012
7 days	1.5 ± 0.5	1.2 ± 0.4	0.030

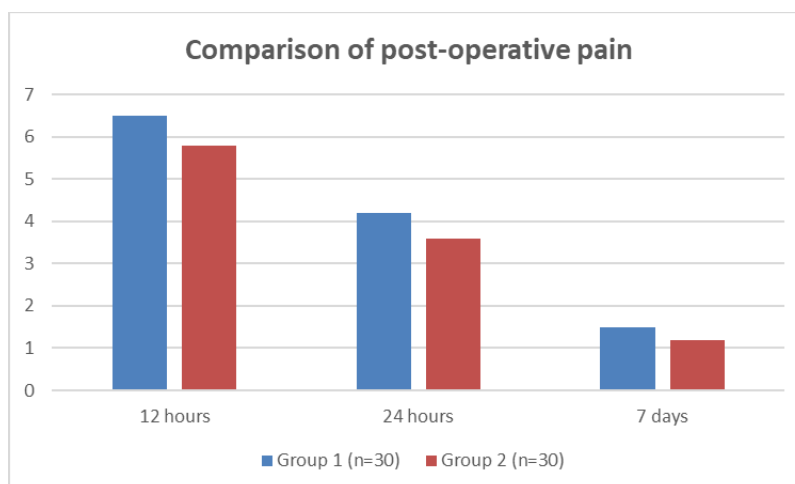


Figure 1. Comparison of postoperative pain

Discussion

Traditionally, doctors treat bilateral inguinal hernias in two stages, not recommending simultaneous repair. Stoppa introduced his midline preperitoneal technique for repairing bilateral hernias. Research

suggests that it is more beneficial to treat bilateral hernias simultaneously rather than in a sequential manner. Amid et al. [11] subsequently recommended the use of the Lichtenstein approach for performing simultaneous repair of bilateral

hernias under local anesthesia. Fischer et al. [12] presented comprehensive evidence about the practicability and acceptability of simultaneously treating bilateral inguinal hernias.

The present investigation aligns with the findings reported by Talha et al. (2015) [13] and Gautam et al. (2017) [14]. The findings from the two studies indicate that the Stoppa treatment had a much shorter operation time compared to the Lichtenstein repair. This aligns with the results obtained in the present investigation. Talha et al. also noted that patients who received the Stoppa treatment experienced decreased levels of postoperative pain after 12 hours, which aligns with the present results. These investigations yielded comparable results in terms of surgical problems, length of hospital stay, and resumption of daily activities. This suggests that Stoppa might serve as a viable alternative to Lichtenstein, with similarly low effects on recovery.

In contrast, the current research and the studies conducted by Barrat et al. (2003) [15] and Koc et al. (2004) [16] exhibit notable similarities and dissimilarities. Barrat et al. have identified a trend for preference for the Stoppa procedure in recurrent hernias to shift towards other techniques like Lichtenstein and laparoscopic repairs, indicative of the evolution of trends in surgical practice. On the other hand, this study has identified that Stoppa is still relevant and efficient, with the added advantage of less postoperative pain. The findings of Koc et al. about the Stoppa technique show improved long-term quality of life outcomes, which align with the current study's results on decreased postoperative pain. However, there were no notable variations in other long-term outcomes.

Prakash et al. (2022) [17] provide more conclusions. When compared to the Lichtenstein repair, both trials have shown that the Stoppa method resulted in shorter operational periods and decreased early postoperative discomfort. Prakash et al. also determined that Stoppa is a viable substitute for Lichtenstein, hence reinforcing the results of the present investigation. This study confirmed that although the Stoppa approach might have certain benefits related to efficiency and pain management, both techniques were equally suitable, but the Stoppa approach demonstrated some advantages concerning operative time and more comfort in the early postoperative period.

Conclusion:

This research compares Lichtenstein tension-free mesh hernioplasty versus Stoppa's treatment for bilateral inguinal hernias. One set (30 patients) of 60 adults had Lichtenstein tension-free hernioplasty, whereas the other received Stoppa. Both treatments showed equal recovery, complications, and operation times. Stoppa repair decreased

postoperative pain compared to Lichtenstein. According to the research, choosing the proper surgery is critical for patient comfort and recovery. Stoppa offers shorter operating times and less early postoperative discomfort, but tension-free mesh hernioplasty repairs bilateral inguinal hernias better. Both methods address bilateral inguinal hernias.

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