

## Original Research Article

# A comparative study of Stoppa's repair versus Lichtenstein technique for surgical management of bilateral inguinal hernia

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### ABSTRACT

**Background:** The surgical management of bilateral inguinal hernias has been a point of contention for a long time, particularly in terms of whether to repair them sequentially or simultaneously, especially following tension-free surgeries. The present study was planned to compare the outcomes of bilateral inguinal hernia repair between patients who underwent the Stoppa's repair and those who underwent Lichtenstein tension free mesh hernioplasty repair.

**Methods:** The study included all patients of both genders with age of 18 years with bilateral inguinal hernias. 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. Patients were randomised into 2 groups based on simple randomization-group 1: patients underwent Lichtenstein tension free mesh hernioplasty; and group 2: patient underwent Stoppa's repair.

**Results:** The operative time was significantly shorter in group 2 patients as compared to 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. Post-operative hospital stays, return to normal daily activities, and chronic groin pain, there was no statistically significant difference between the two groups.

**Conclusions:** The present study was unable to show that either technique was superior in the treatment of bilateral inguinal hernias. Both procedures, on the other hand, were capable of achieving favourable postoperative outcomes and had similar problems.

**Keywords:** Bilateral inguinal hernia, Surgical management, Stoppa's repair, Lichtenstein technique, Tension free hernioplasty

### INTRODUCTION

An inguinal hernia is an out-pouching of the peritoneum, with or without its contents, that occurs at the level of the inguinal canal in the groin through the muscles of the anterior abdominal wall.<sup>1</sup> Because of the inherent weakness of the abdominal wall where the spermatic cord passes through the inguinal canal, it almost always affects men. A lump in the groin can result from a portion of bowel becoming caught in the peritoneal pouch. The

hernia can extend into the scrotum, causing pain and discomfort. Primary hernias are distinct from recurrent hernias in that they occur for the first time.<sup>2</sup> The problem can occur in one groin (unilateral hernia) or both groin at the same time (bilateral hernia), and it can come recur after surgical treatment (recurrent hernia). The hernia sac bulges directly through the posterior wall of the inguinal canal (direct hernia) or passes through the internal inguinal ring alongside the spermatic cord as well as follows the course of the inguinal canal (indirect hernia)

(indirect hernia).<sup>3</sup>

Because of its frequency, complexity, and socioeconomic consequences, inguinal hernia is one of the most difficult surgical pathologies to treat.<sup>4</sup> A person's chances of having to have an inguinal hernia operation during his or her lifetime are quite high, with men having a 27 percent chance and women having a 3 percent chance.<sup>5</sup> Inguinal hernia is only treated and cured through surgery. Adults have never been reported to recover spontaneously. Although many different surgical procedures have been tried to treat inguinal hernia over the years, recurrences are unavoidable. By studying the anatomy of the inguinal region in depth, the rational choice of the type of procedure to achieve better surgery results was possible.<sup>6</sup>

A special entity among inguinal hernias is represented by bilateral hernia. The current treatment recommendation for bilateral inguinal hernias is to repair both sides in the same surgery and anaesthetic procedure, with the mesh placed on the transverse or pre-peritoneal fascia.<sup>7,8</sup> A giant pre-peritoneal prosthesis is inserted through an infraumbilical midline incision in the Stoppa technique.<sup>9</sup> After the principles of the techniques described by Stoppa et al, Nyhus et al, and McVay and Anson were incorporated, laparoscopic hernia repair became possible.<sup>9-11</sup> The Stoppa's repair is a tension-free hernia repair that involves wrapping prosthetic mesh around the lower part of the parietal peritoneum and placing it at a preperitoneal level through a Pfannenstiel incision. This technique has had particular success in the repair of bilateral hernias, large scrotal hernias, and recurrent hernias, all of which are difficult to repair and have a high rate of morbidity and failure.<sup>9-11</sup>

Prolene mesh prosthetic repair by Lichtenstein technique has recently become popular, and it is a tension-free repair. Although the mesh provides a mechanical barrier, it does not provide mobility or a physiologically dynamic posterior wall. Furthermore, this procedure is linked to an increased risk of infections, recurrence, chronic pain, testicular atrophy, and infertility, as well as foreign body sensations and chronic groin sepsis, which may necessitate mesh removal in some cases.<sup>12,13</sup>

Other tissue repairs, such as the modified Bassini, iliotibial tract repair, shouldice, Nylon-Darn, Halsted-Tanner, McVay, and many others, either need extensive surgical experience or are tension repairs that are prone to recurrence. Because of the complexity of the operations, recurrences differ from surgeon to surgeon and centre to centre.<sup>14</sup> Studies have indicated that procedures that use a tension-free mesh cause less pain and have a reduced post-operative recurrence rate.<sup>15</sup> Although laparoscopic inguinal hernia repair has been around for nearly two decades, it is not universally accepted. Some issues, such as the need for substantial training, the shaky benefit to the patient, and the higher expense, explain why the laparoscopic technique hasn't been adopted as the usual procedure for all patients.<sup>16</sup> The goal of this study was to

compare the outcomes of bilateral inguinal hernia repair between patients who underwent the Stoppa's repair and those who underwent Lichtenstein tension free mesh hernioplasty repair.

## METHODS

A prospective, open, randomized, comparative study was undertaken at NAMO medical education and research institute in Silvassa, Dadra and Nagar Haveli, and Daman and Diu (UT), India, between December 2018 and March 2020. The protocol was approved by the institutional ethics committee. Before being included in the study, informed written consent was obtained from all patients.

This study included all patients of both genders with age of 18 years and above visiting the department of general surgery of the institute with bilateral inguinal hernias. 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. 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 30 patients-15 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.<sup>17</sup> 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.<sup>18-21</sup> 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' retropubic space was dissected, and the rectus abdominis muscle and epigastric vessels were reached laterally, extending to the retroinguinal 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 20 software (SPSS v.20.0) 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 30 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, 15 patients underwent bilateral Lichtenstein tension-free hernioplasty, while group 2 underwent Stoppa repair. As per Table 1, majority of the patients were males (M/F-group 1: 12/3; group 2: 13/2). Other 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 (43.33±7.23 min), whereas it was 78.54±8.51 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: Characteristics of the patients, (n=15).**

Characteristics	Group 1	Group 2	P value	
Age (years); Mean ± SD	45.89±10.20	48.45±11.78	0.623	
Male/Female	12/3	13/2	0.543	
BMI (kg/m <sup>2</sup> ); Mean ± SD	28.50±5.43	29.97±4.66	0.766	
Co-morbidities	Hypertension	3	2	0.886
	Diabetes	4	4	
	COPD	5	6	
Smoking	7	6	0.754	

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

Variables	Group 1	Group 2	P value	
Operation time (min); Mean ± SD	78.54±8.51	43.33±7.23	<0.001	
Post-op complications	Wound hematoma	3	2	0.478
	Urine retention	1	1	
	Wound infection	1	0	
	Scrotal hematoma	1	1	
	Groin pain	12	13	
Post-op hospital stays (days); Mean ± SD	1.07±0.29	1.04±0.21	0.634	
Return to work (days); Mean ± SD	18.34±3.01	19.05±3.80	0.987	

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

Groups	Post-operative pain		
	12 hours	24 hours	7 days
Group 1; Mean ± SD	7.23±1.56	4.80±1.67	1.88±1.09
Group 2; Mean ± SD	6.16±1.08	4.57±1.24	1.57±0.87
P value	0.023*	0.661	0.908

## 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.<sup>9,20</sup> Bilateral hernias should be repaired at the same time rather than sequentially, according to research.<sup>22,23</sup> Amid et al later advocated using the Lichtenstein technique for simultaneous repair of bilateral hernias under local anaesthesia.<sup>24</sup> Fischer et al provided excellent documentation of the feasibility and tolerability of

repairing bilateral inguinal hernias at the same time.<sup>25</sup> 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.<sup>26</sup> 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±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.<sup>27</sup>

In our investigation, there was no significant difference in postoperative hospital stay between the two groups, which was consistent with Malazgirt et al findings.<sup>26</sup> For bilateral Lichtenstein repair, Maciel et al found a mean postoperative hospital stay of 1.55±0.83 days (most of their patients were admitted for 1 day).<sup>28</sup> 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.<sup>22,23</sup> 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.<sup>29</sup> 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.<sup>30</sup>

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.<sup>31</sup> 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.<sup>26,27</sup> Our findings were analogous to all these three studies, since we also found no significant differences in postoperative complications between the two groups.

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.<sup>27</sup>

## CONCLUSION

To summarize, the present study was unable to show that either technique was superior in the treatment of bilateral inguinal hernias. Both procedures, on the other hand, were capable of achieving favourable post-operative outcomes and had similar problems. The majority of the patients were receptive to both approaches. 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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