

# Comparison of Open Pre-Peritoneal Mesh Repair with Lichtenstein Repair in Complex Inguinal Hernias

FAIZUL HASAN, TAHIR HAMID, AMIR USMAN, MANSAB ALI

## ABSTRACT

**Aim:** To compare open pre-peritoneal mesh repair with Lichtenstein repair in complex inguinal hernias for early postoperative complications, postoperative hospital stay and recurrence.

**Method:** The study was conducted in Surgical Unit-I, Nawaz Sharif Social Security Teaching Hospital, Lahore for one year from 01-01-2013 to 31-12-2013. Sixty patients fulfilling inclusion criteria were included in this study and they were divided into two equal groups A and B. The Group A was treated with open pre-peritoneal mesh and Group B was treated by Lichtenstein repair.

**Results:** The mean age in Group A was  $40.67 \pm 16.39$  years and in Group B was  $42.67 \pm 15.88$  years. The mean postoperative hospital stay in Group A (open pre-peritoneal mesh) was  $3.5 \pm 2.57$  days. The mean Postoperative hospital stay in Group B (Lichtenstein repair) was  $3.03 \pm 2.77$  days. In Group A, 24 (80%) patients had mild pain and 6 (20%) patients had moderate pain and in Group B, 25 (83.3%) patients had mild pain, 4 (13.3%) had moderate pain and 1 (3.3%) patient had severe pain. In early postoperative complications in Group A, 2 (6.7%) patients developed urinary retention, 1 (3.3%) wound infection, 1 (3.3%) wound haematoma, 3 (10%) scrotal haematoma, 1 (3.3%) scrotal seroma and there was no wound seroma. In Group B, 3 (10%) patients developed urinary retention, 2 (6.7%) wound infection, 2 (6.7%) wound haematoma, 1 (3.3%) scrotal haematoma, 1 (3.3%) wound seroma and there was no scrotal seroma.

**Conclusion:** Open pre-peritoneal mesh and Lichtenstein repair are comparable in postoperative hospital stay, early postoperative complications and recurrence rate.

**Keywords:** Open pre-peritoneal mesh repair, Lichtenstein repair, complex inguinal hernia.

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## INTRODUCTION

Surgery of inguinal hernias was mentioned in the literature of antiquity by Celsus during the first century AD. However, operation on an anatomic basis could be performed only after modern anatomy had been established during the 16<sup>th</sup> century<sup>1</sup>. Open surgery for groin hernia has gone through many stages of development, including the ancient era (ancient times to the fifteenth century), the era of the start of herniology (fifteenth to seventeenth century), the anatomic era (seventeenth to nineteenth centuries), the era of repair under tension (nineteenth to mid-twentieth century), and the era of tensionless repair (mid-twentieth century to the present)<sup>2</sup>.

Since the introduction of the Bassini method in 1887, more than 70 types of pure tissue repair have been reported in the surgical literature<sup>3</sup>. An unacceptable recurrence rate and prolonged postoperative pain and recovery time after tissue repair led to the concept of tension-free hernioplasty with mesh<sup>3,4</sup> in which the mesh is placed in front of the transversalis fascia, such as Lichtenstein tension-free hernioplasty, or behind the transversalis fascia in

the pre-peritoneal space, such as Nyhus, Rives, Read, Stoppa, Wantz and Kugel procedures<sup>3</sup>. Tension-free mesh repair has become the gold standard procedure for repairing inguinal hernias<sup>5,6</sup>.

Repair of large, bilateral and recurrent or multiple recurrent hernias is frequently difficult and has been associated with high rates of recurrence and complications.<sup>7</sup> The reconstruction of the posterior barrier of the groin represents one of the major objectives in the hernia repair. Alloplastic materials have been recommended as reinforcement for the inguinal fascia since the mid-1980s. The modern day prosthetic materials have well tolerated biore activity, allow efficient fibroplasias, diminish postoperative pain and significantly reduce the recurrence rate and convalescence period<sup>8</sup>.

Open pre-peritoneal repair (Stoppa technique) for complex and recurrent inguinal hernia has been regarded as a safe procedure. Recurrence rate of 0-4% have been described in the world literature<sup>9,10</sup>.

Lichtenstein addressed the issue of tension by popularizing routine use of mesh, coining the term "tension-free" hernioplasty<sup>11</sup> in which, instead of suturing anatomic structure that are not normally in apposition, the entire inguinal floor is reinforced by insertion of a sheet of mesh.<sup>12</sup> The procedure is regarded as safe and cost effective in terms of

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Department of Surgery, Nawaz Sharif Social Security Teaching Hospital, Lahore.

Correspondence to Dr. Faizul Hasan, Associate Professor of Surgery. Email: maisamhasan@hotmail.com

morbidity and short term outcomes like postoperative pain and return to work. Recurrence rates of 0.4-3.3% have been reported in various large series<sup>13,14</sup>.

## OBJECTIVES

To compare open pre-peritoneal mesh (Stoppa) repair with tension free onlay (Lichtenstein) repair in complex inguinal hernias regarding:

- Early outcome in terms of postoperative complications
- Late outcome in terms of recurrence

## MATERIAL AND METHODS

This study was conducted at Surgical Unit-I, Nawaz Sharif Social Security Teaching Hospital, Lahore for one year, from 01-01-2013 to 31-12-2013. Sixty patients of complex inguinal hernias were divided into two equal groups (A and B). Each group was composed of thirty patients. For Group A, open pre-peritoneal mesh repair (Stoppa) was performed through an incision 3 to 4 cm above the classical incision. For Group B, Lichtenstein repair with open anterior approach performed through a supra inguinal incision. Patients monitored for post-operative complications including pain, urinary retention, wound swelling (haematoma or seroma) scrotal (haematoma or seroma), wound infection and other complications. They were discharged as they recover and hospital stay was noted for each group. All patients were followed in surgical out-patient department. Follow up was at 7<sup>th</sup> and 14<sup>th</sup> post of day for early complications. Subsequently, they were examined at 3 and 6 months interval for late complications.

## RESULTS

Group A = Open pre-peritoneal mesh repair  
Group B = Lichtenstein repair

The age distribution of patients in two groups is shown in Table 1. The mean age in both groups is comparable. The majority of patients in two groups were between 25 and 40 years of age. The occurrence and severity of postoperative pain in two groups is shown in Table III. There is no significant difference in two groups. The Post-operative hospital stay in each group is shown in Table II. The mean post-operative hospital stay between two groups is comparable. The early postoperative complications are shown in Table V. There is no significant difference between the two groups (P-value > 0.05). There were two recurrences in Group A (pre-peritoneal mesh repair), one was at three months and other was at six months follow up. One recurrence was noted in Group B (Lichtenstein repair). There is no significant difference between two groups (P-value > 0.05).

Table I: Age (in years) in two groups

Groups	n	Mean	S.D
A	30	40.67	16.395
B	30	42.73	15.885

Table II: Post-operative hospital stay (in days) in two groups

Groups	n	Mean	S.D
A	30	3.50	2.570
B	30	3.03	2.773

Table III: Post-operative pain in two groups

Postop pain	Group A	Group B
Mild	24(80%)	25(83.3%)
Moderate	6(20%)	4(13.3%)
Severe	0	1(3.3%)

Table IV: Early post-operative complications in two groups

Complications	Group A	Group B
Urinary retention	2(6.7%)	3(10%)
Wound infection	1(6.7%)	2(6.7%)
Wound haematoma	1(3.3%)	2(6.7%)
Scrotal haematoma	3(10%)	1(3.3%)
Wound seroma	0	1(3.3%)
Scrotal seroma	1(3.3%)	0

Table V: Recurrence at three and six months follows up in two groups

Recurrence	Group A	Group B
Three months	1(3.3%)	1(3.3%)
Six months	1(3.3%)	0

## DISCUSSION

Since the introduction of Bassini method for hernia repair in late 19<sup>th</sup> century, many types of tissue repairs have been proposed.<sup>3</sup> Hernia repair under tension is known to be a prime cause of recurrence and post-operative pain<sup>15</sup> especially so for large and recurrent hernias. This led to evolvement of tension-free hernioplasty<sup>16</sup>.

Presently, tension-free hernioplasty with mesh has become a "Gold standard"<sup>16</sup> procedure, which can be achieved by interposing a synthetic mesh either in front of fascia transversalis as in Lichtenstein<sup>12</sup> repair or behind the fascia transversalis in pre-peritoneal space as in Stoppa<sup>8</sup>. Stoppa RE<sup>17</sup> familiarized open pre-peritoneal mesh repair especially for the treatment of bilateral hernias in early eighties. Pre-peritoneal repair has some advantages over the traditional anterior approach. The site of the incision is located in a new place for recurrent inguinal hernia; where the dissection is easier than the previous incision, the stitch sinuses from pervious repair can be avoided. The risk of damage to the testicular vessels is also reduced markedly, and it also permits inspection of all potential groin hernia sites.<sup>10</sup>It ensures a short recuperation time, and the recurrence rate is low,

owing to adequate overlap of the hernia defect. Pre-peritoneal approach has been reported to have excellent safety profile, low morbidity and low recurrence rates and learning curve is also short<sup>8</sup>.

Lichtenstein repair has the advantage that it is tension free and it can be done under local anesthesia even on outdoor basis. Complications of general and regional anesthesia can be avoided<sup>11,16</sup>. However, in a recurrent hernia, it can be difficult to dissect through the previous scarred and fibrosed tissue and potential risk of damage to ductus deferens and testicular vessels. Dissection may be difficult for large and complex hernias that can be easily dissected through pre-peritoneal approach<sup>18</sup>.

The present prospective study compares the early and late post-operative complications of open pre-peritoneal mesh with Lichtenstein repair for the treatment of complex inguinal hernias. In Group A, we performed open pre-peritoneal mesh hernioplasty. For Group B, we adopted Lichtenstein repair.

There was no deep infection in both groups and none of the patient required removal of prosthesis. The overall occurrence of complication in two groups was similar. In our study, one (3.3%) patient in Group A and two (6.8%) patients in Group B developed wound infection. They were managed by opening of the wound stitches, antibiotics and twice daily dressings. Similar results have reported in various large series<sup>11,18</sup>.

The mean hospital stay for both the groups was similar (Group A 3.5±2.5 days and in Group B 3.03±2.77 days). One patient (3.3%) in Group A had severe pain managed by two additional doses of narcotic analgesics besides regular dose of Diclofenac Sodium. Two (6.7%) patients in Group A and three (10%) patients in Group B developed post-operative urinary retention which was managed by Foleys in and out. No testicular complications in both groups. Haematomas (wound and scrotal) are known complications after mesh hernioplasties<sup>10,12</sup>. In Group A, 1(3.3%) patient developed wound haematoma and 3(10%) developed scrotal haematoma. While in Group B, 2(6.8%) patients developed wound haematoma, 1(3.3%) scrotal haematoma. Wound haematomas aspirated with wide bore needle, scrotal haematomas by elevation alone.

After mesh hernioplasties, patients may develop seromas. In our study, 1(3.3%) patient in Group A developed scrotal and 1(3.3%) patient in Group B developed wound seroma. They were aspirated by wide bore needle. Recurrences after mesh repair of hernia occur early and are related to technical factors such as inadequate dissection, insufficient prosthesis size, inefficient fixation of mesh and surgeon's inexperience<sup>13,14,18</sup>. In our study, 2(6.8%) recurrences occurred in Group A and one (3.3%) in Group B. These recurrences were managed successfully with

reoperation. Muldon RL<sup>9</sup> concluded there is no significant difference in recurrence between Lichtenstein and anterior pre-peritoneal repair. We had a relatively higher recurrence rate (6.7%) in pre-peritoneal group as compared to other studies<sup>9,18</sup> mentioned above. The limitations of our study are relatively shorter follow-up (6 months) and a relatively smaller group of patients (60 patients).

## CONCLUSION

No significant difference was found between open pre-peritoneal repair and Lichtenstein repair for complex inguinal hernias in adults, as regards early post-operative complications and recurrence rate. An open pre-peritoneal repair was relatively easy approach because of virgin area especially in recurrent cases. However, a larger group of patients and a larger period of follow-up is recommended for better comparison between two groups.

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