

## Clinical Comparison of Postoperative Complications after Lichtenstein versus Bassini Inguinal Hernia Repair

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### Abstract

**Background:** In this study we investigated the differences between tension free versus not tension free inguinal hernia repair in occurrence of various postoperative complications.

**Methods:** The study included 65 male patients with direct or indirect inguinal hernia operated at the Department of Abdominal and General Surgery, between March 2012 and March 2014. The patients were divided into two groups. Evaluated were postoperative complications..

**Results:** No statistically significant differences in incidences of postoperative complications between two groups ( $p < 0.05$ ).

**Conclusion:** Obtained results show that tension-free mesh repair is equivalent to the not tension free hernia repair method with regards of postoperative complications, severity of postoperative pain and ambulance.

**Keywords:** inguinal hernia, tension-free, no tension-free, postoperative complications.

### Introduction

Inguinal hernias represent 65%-75% of cases of abdominal wall hernias, with men having 28% and women having 4% lifetime risk of occurrence (1). There are multiple factors involved in inguinal hernia, including pathogens initial incomplete closure of abdominal wall, loss of abdominal wall strength, increased intra-abdominal pressure and changes in the connective tissue (2). Some patients possess characteristics which expose them to a higher risk for postoperative complications and hernia recurrence. Some of these characteristics are older age (>70 years), incisional hernia, previous abdominal surgery and chronic cough (3).

Tension-free hernia repair introduced by Lichtenstein remains the gold standard in open inguinal hernia treatment

due to low recurrence rates compared with classical repairs 0.3% to 2.2% vs. 4.4% to 17% (4, 5). It is hypothesised that hernia recurrence after Lichtenstein repair is connected with insufficient medial mesh fixation and mesh overlap over the pubic tubercle (6). Mesh placement has also good impact on recurrence rates, but chronic groin pain remains a problem. Prevalence of chronic groin pain is reported to be 25-35% (7, 8). Another common complication after hernia repair is postoperative wound infection, which occurs in 0% to 7% (9).

Lichtenstein repair as open hernia repair, which uses only mesh placement, has many alternatives.

Comparison studies of these techniques showed no difference in short-term and long-term results, except of shorter operative time in not tension-free (10, 11). In addition, self-gripping meshes have been designed with the idea to lower acute and chronic groin pain, but meta-analysis did not reveal any important difference compared with Lichtenstein mesh fixation (12, 13). Mesh repairs can be used in incarcerated hernia cases, however, use of prosthetic material represents a risk for surgical site infection, especially when intestines are gangrenous and resection is required (14–15).

The aim of this study is to compare postoperative results between tension-free repair and not tension-free repair.

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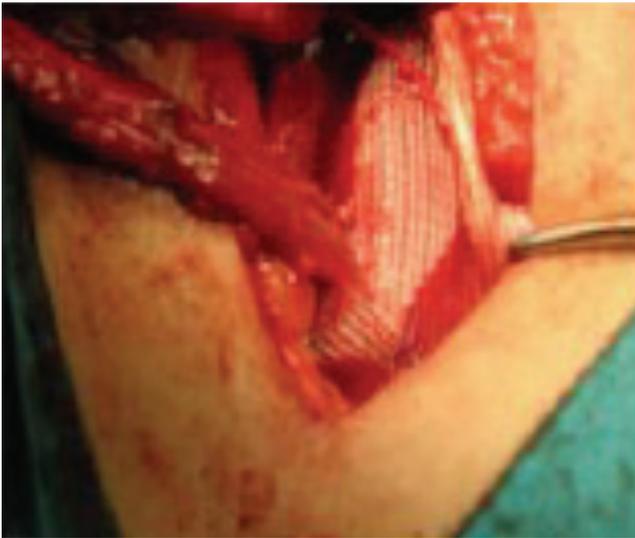


Figure 1: Mesh placement during tension-free Lichtenstein method (source: Nuhi Arslani)

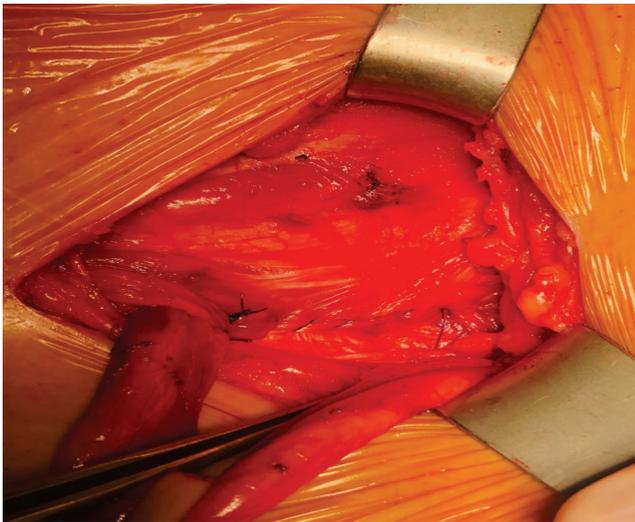


Figure 2: Without mesh placement method (source: Nuhi Arslani)

## Patients and methods

The study took place between March 2012 and March 2014 at The Department for Abdominal and General Surgery. In this time eighty male patients with unilateral direct or indirect inguinal hernia were included in the study.

The patients were randomly allocated to two groups. The first group consisted of 35 patients treated with tension-free Lichtenstein repair and the second group of 25 patients treated with no tension-free inguinal hernia repair. Patient follow-up lasted a year and ended in March 2014. The groups had comparable socio-economic, demographic and health related characteristics. Excluded were patients with recurrent hernia, incarcerated or gangrenous hernia requiring emergency surgery, ASA  $\geq$  3, patients unable to provide VAS scores and patients with infection of the

inguinal region. All patients received intravenous antibiotic prophylaxis.

In Lichtenstein repair polypropylene mesh (6 x 11 cm) was fixed at inguinal ligament (starting point at pubic tubercle) with a continuous 2/0 polypropylene suture and at conjoint tendon with single suture. In no tension-free repair the internal inguinal canal defect and sutured with 2/0 polypropylene.

After the surgical procedure, the following postoperative events were observed: urinary retention, early bleeding (within 24 hours) and late bleeding (24 hours or more), wound and implant infection, scrotal hematoma, testicular atrophy and inguinal hernia recurrence. Subjective pain was assessed with the Visual-Analogue Scale (VAS) of 0-10 and mobilisation within the first 24 hours was observed. We have defined a patient's mobility as ability to walk more than 100 metres without discomfort.

Patients were further divided into groups based on the VAS pain scale score:

- scores 0-3: no pain, mild pain without discomfort;
- scores 4-7: moderate pain with discomfort;
- scores 8-10: severe pain, intolerable pain.

Statistical analysis was performed using student t-test and chi square test. P value lower than 0.05 was considered as statistically significant.

## Results

The incidence and type of complications regarding operation performed are listed in table 1. There are no statistically differences between prevalence of urinary retention, bleeding or hematoma formation, wound infection and postoperative pain severity between patients operated with tension-free Lichtenstein or not tension-free hernioplasty. One patient from the Lichtenstein group has developed

| Complication                      | Lichtenstein method | without mesh method | p value |
|-----------------------------------|---------------------|---------------------|---------|
| Urinary retention N (%)           | 6 (13.3)            | 4 (11.4)            | 0.798   |
| Early bleeding N (%)              | 3 (6.6)             | 2 (5.7)             | 0.868   |
| Late bleeding N (%)               | 1 (2.2)             | 2 (5.7)             | 0.554   |
| Wound and implant infection N (%) | 1 (2.2)             | 2 (2.9)             | 0.431   |
| Scrotal hematoma N (%)            | 8 (26.6)            | 4 (11.4)            | 0.101   |
| Testicular atrophy N (%)          | 1 (3.3)             | 0 (0.0)             | 0.003   |
| Early mobilisation N (%)          | 8 (17.8)            | 15 (42.8)           | 0.016   |
| Late mobilisation N (%)           | 37 (82.2)           | 20 (57.2)           | 0.036   |
| Pain assessment on VAS N (%)      |                     |                     |         |
| scores 0-3                        | 8 (17.8)            | 8 (22.8)            | 0.581   |
| scores 4-7                        | 15 (33.3)           | 15 (42.8)           | 0.385   |
| scores 8-10                       | 22 (48.9)           | 12 (34.4)           | 0.192   |
| Recurrence N (%)                  | 0 (0.0)             | 0 (0.0)             |         |

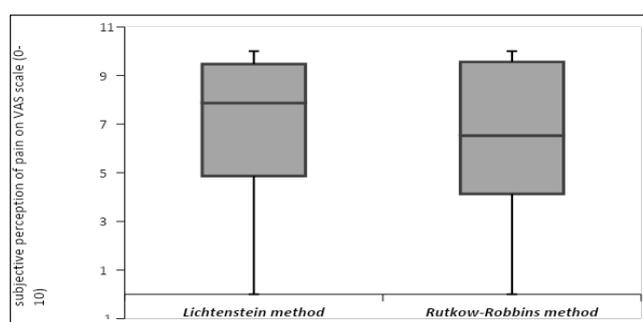
Table 1. Postoperative complication

testicular atrophy and none from the not tension-free group ( $p=0.003$ ).

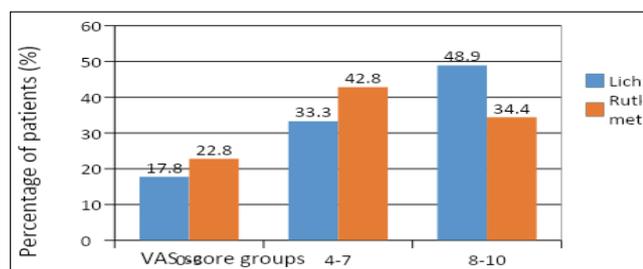
The patients were faster mobile after Lichtenstein repair, but after 24 hours patients were more mobile in a not tension-free group.

Postoperative pain was equivalently represented in both groups of patients. The results of pain assessment with VAS are represented in Graph 1,2.

The pain was sufficiently treated with metamizole and piritramide. Urinary retention was resolved with urinary catheter insertion. Seromas and hematomas have resolved spontaneously with time. Wound infection was treated with antiseptic dressing, oral antibiotics and anti-inflammatory drugs. None of the patients required mesh removal surgery.



Graph 1. Patient division in VAS score groups regarding operation performed



Graph 2. Pain perception scale groups

## Discussion

In our study we compared Lichtenstein as tension-free and not tension-free procedure regarding complication, postoperative pain and ambulation. Some of the complications like seromas could be avoided by minimizing the hernia sac dissection, transversalis fascia fenestration and drain placement. Most seromas or hematomas resolved in a period of 4 weeks spontaneously. The number of observed hematoma or seroma formation was not statistically significant in compared groups and did not need any further treatment.

Urinary retention was observed in 12% of patients operated in our institution. A connection between urinary retention and prostatism was observed. To avoid this kind of complication patients could be catheterised prior to the surgery with catheter removal after surgery.

Testicular pain or swelling was observed in fewer patients after non mesh repair (11.4%) as after Lichtenstein hernioplasty 26.6%, but the differences was not statistically significant. This kind of complication is mostly connected to large or complete sac dissection and can be minimised with scrotal compression (16). Pain is treated with analgesics unless it arises from more serious hernia repair complication such as wound infection, mesh rejection and bowel obstruction or perforation. In these cases, antibiotic therapy and surgery are needed to solve the underlying problem (17). Destek and Gul compared Lichtenstein and non mesh repair methods in indirect inguinal hernia patients with regards to operation time, hospital stay, postoperative pain and more. Hospitalization time and postoperative pain were significantly shorter in patients who underwent mesh-plug repair.

Newer hernia meshes and plugs are designed to completely fit the shape of a herniated part of abdominal wall. With many mesh materials on the market nowadays, surgeon's preference for a specific mesh is based on several factors, including size of the hernia, cost of the procedure, open of laparoscopic repair methods, patient characteristics and chances for future complications based on these characteristics. The surgeon should choose a method that he is familiar with, since mesh-only or mesh-plug methods have practically identical short-term or long-term results.

## Conclusion

We have found no statistically significant differences in incidences of postoperative complications between tension-free Lichtenstein versus not tension-free Bassini group in inguinal hernia repair groups. Based on gathered results, without mesh method is equal to the Lichtenstein mesh-only hernia repair with regards to observed postoperative complications.

**COI Statement:** This paper has not been submitted in parallel. It has not been presented fully or partially at a meeting or podium or congress. It has not been published nor submitted for consideration beforehand.

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