



Research Article

LICHTENSTEIN TENSION-FREE MESH HERNIOPLASTY: OUR EXPERIENCE OVER 7 YEARS

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ABSTRACT

Background: Inguinal hernia repair is the most commonly performed operation due to a significant lifetime incidence and variety of successful treatment modalities. Recurrences have been a significant problem following hernia repair. Prosthetic materials have been used increasingly in hernia repair to prevent recurrences. The Lichtenstein tension-free repair has become dominant method of inguinal hernia repair. The advantages of this repair were its association with less pain, rapid postoperative recovery, early return to normal activity and very low recurrence rate. We evaluated the treatment outcome of tension free hernia repair of inguinal hernias by Lichtenstein technique using polypropylene mesh.

Methods: In this retrospective study, 672 tension free inguinal hernia repairs were performed between October 2011 and October 2018, using a polypropylene mesh by Lichtenstein technique. The main outcome measure was early and late morbidity, especially recurrence.

Results: Inguinal hernia was indirect in 58% of cases (390 patients), direct in 32%(215 patients) and of pantaloon type in 10%(67 patients). Mean patient age was 48.4 years (range: 18-86 years). Median follow-up period was 2.1 years (range: 3 months to 7 years). Seroma and hematoma formation requiring drainage was observed in 4 and 1 patients, respectively. While transient scrotal swelling occurred in 12 patients. Superficial surgical site infection was observed in 6 patients, however, we have not observed acute deep surgical site infection or abscess formation in our study. There was 2 recurrence of hernia in these patients (recurrence rate:0.29%).

Conclusion: Lichtenstein tension-free mesh inguinal hernia repair is a simple, safe, comfortable, effective method with extremely low early and late morbidity and remarkably low recurrence rate.

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INTRODUCTION

Weakening of the abdominal wall tissue as one of the causes of inguinal hernia was suspected by Cooper as far back as 1800. The matter was emphasized again in 1922 by Harrison when he wondered why a significant number of men develop hernias at age 50 to 60, years after their active life is over. Need for prosthetic reinforcement of weakened abdominal wall tissue was recognized by Billroth. However, early generations of prostheses resulted in disastrous complications from rejection and infection. It was not until the introduction of polypropylene mesh by Usher in 1959 that Billroth's dream was realized.

With the necessity of prosthesis for the repair of inguinal hernia in mind, and focusing on the principle of 'no tension', the Lichtenstein group popularized routine use of mesh in 1984 and coined the term 'tension-free hernioplasty'.

Approximately 75% of abdominal wall hernias occur in the groin. The lifetime risk of inguinal hernia is 27% in men and 3% in women. Of inguinal hernia repairs 90% are performed in men and 10% in women. Inguinal hernia repair is the most common operation performed, owing to a significant lifetime incidence and variety of successful treatment modalities. [1]

All modern repair techniques are very effective with regard to recurrence, and traditional end point recurrence has switched to other outcome measures such as patient comfort, satisfaction, and time to rehabilitation. Recurrence following repair of inguinal hernias is a significant problem for both the

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surgeon and patient. There is evidence that a defect in the metabolism of collagen is involved in the pathogenesis of inguinal hernia in adults, leading to weakening of transversalis fascia. Obviously the use of such weakened tissue is problematic, in an attempt to reduce incidence of recurrences and to reinforce the plastic reconstruction various techniques have been used, including autologous tissue techniques and a variety of biomaterials.^[2,3] Usher proposed the use of high-density polyethylene to repair tissue defects of chest and abdomen about a century ago.^[4,5] The reports by Stoppa *et al*^[6] and by Lichtenstein^[7], as well as the innovation of laparoscopic hernia repair^[8,9] where the use of prostheses was associated with many advantages greatly contributed to this change in our surgical philosophy.

In tension-free hernioplasty, instead of suturing anatomic structures that are not in apposition, the entire inguinal floor is reinforced by insertion of a sheet of mesh. The prosthesis that is placed between the transversalis fascia and the external oblique aponeurosis extends well beyond Hesselbach's triangle in order to provide sufficient mesh-tissue interface. The operation is therefore therapeutic as well as prophylactic; thus it repairs and protects the entire susceptible region of the groin to herniation from all future metabolic and mechanical adverse effects.

The Lichtenstein tension-free repair has become the dominant method of inguinal hernia repair.^[10] The advantages of repair were less pain, rapid post-operative recovery and very low recurrence rate. However it is associated with complications such as foreign body reaction, infection, migration, shrinkage, seroma and hematoma formation, orchitis, testicular atrophy^[11] and recurrence.

This retrospective study tries to evaluate the treatment outcome of tension-free repair of inguinal hernia by Lichtenstein technique.

MATERIAL AND METHODS

This was a retrospective study conducted in a single unit in the department of general surgery, Safdarjung Hospital, New Delhi on 672 patients who underwent inguinal hernia repair using polypropylene mesh by Lichtenstein tension-free hernia repair between October 2011 and October 2018.

Inclusion criteria

Patients aged > 18 years diagnosed with reducible inguinal hernia and operated electively by Lichtenstein tension-free mesh hernia repair

Exclusion Criteria

1. Age <18 years
2. Irreducible hernia, obstructed hernia, strangulated hernia, recurrent hernia
3. Uncontrolled diabetes mellitus
4. After admission a detailed history and examination was performed. All patients underwent basic investigations. All cases were operated electively in a single unit of general surgery department in Safdarjung Hospital, New Delhi.
5. Procedure
6. Prophylactic antibiotics were given routinely one hour before surgery (1.2gm inj. Augmentin i.v).

All cases were performed under spinal anaesthesia. All patients' hernia were repaired according to Lichtenstein technique and polypropylene mesh was used (3*6 inch) which was trimmed to fit floor of inguinal canal and its apex sutured to pubic tubercle using 2-0 polypropylene suture. Multiple interrupted sutures were placed between lower border of mesh and free edge of inguinal ligament, after an opening was made to accommodate the spermatic cord extending up to just medial to anterior superior iliac spine. Interrupted polypropylene sutures then suture the two cut edges of the mesh together around the spermatic cord. The mesh is then anchored to conjoint tendon by interrupted polypropylene sutures. No drains were used. Post-operatively, patient was given analgesics and intravenous antibiotics. (Figure 1) All patients were discharged on second post-operative day and followed up of outpatient basis. Sutures were removed after 10 days. Data recorded included age, sex, site of hernia, unilateral or bilateral hernia, postoperative complications and recurrence in the follow-up period.

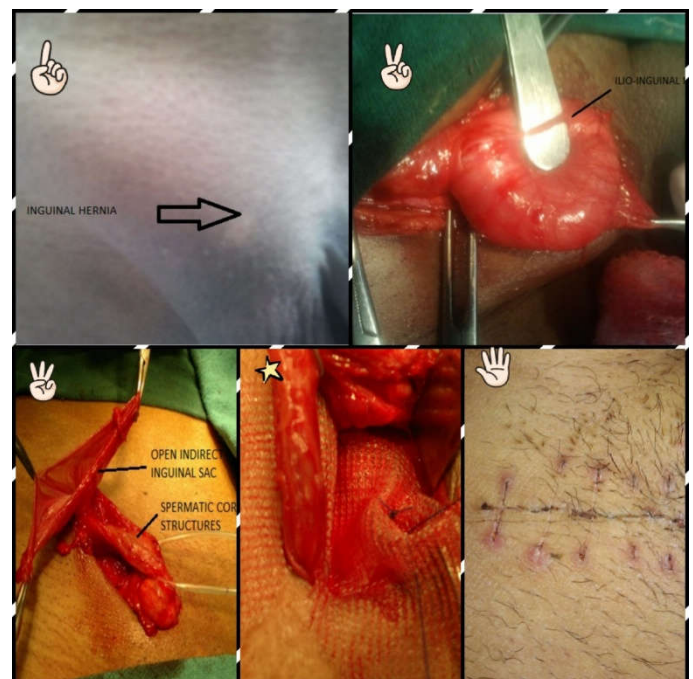


Figure 1 (1) right inguinal hernia, (2) post dissection visible hernial buldge with ilioinguinal nerve, (3) hernial sac separated from spermatic cord, (*) prolene mesh placement and fixation by suture, (5) postoperative result after suture removal.

RESULTS

Following results were noted

672 patients with complicated inguinal hernia who underwent Lichtenstein tension free inguinal hernia repair was reviewed.

Gender wise distribution:-651(97%) were males and 21(3%) were females.(figure 1).

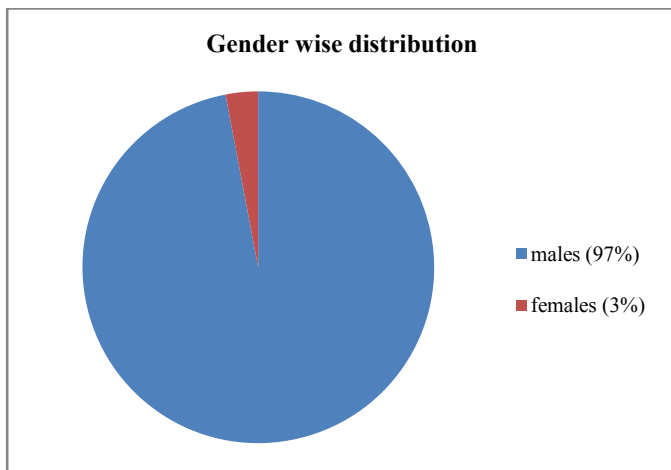


Figure 1 Gender wise distribution of inguinal hernia

- a. *Age wise distribution*:-Age of patient ranged from 18 to 86 years with mean age of 48.4 years.
- b. *Type of hernia*:- 390 patients (58%) had indirect hernia, 215 patients(32%) had direct and 67 patients (10%) pantaloon hernia.(table 1)

Table 1 distribution of inguinal hernias according to type

Type	Number	Percentage (%)
Indirect	390	58
Direct	215	32
pantaloon	67	10

Side of presentation:-631 patients (93.9%) had unilateral hernia and 41 patients (6.1%) had bilateral hernia. Out of 631 patients, 372 patients (59%) had right sided hernia and 259 patients (41%) had left sided hernia.(table 2)

Table 2 distribution of inguinal hernias according to side of presentation

Side	Number	Percentage (%)
Right	372	55.4
Left	259	38.5
Bilateral	41	6.1

Comorbidities: 26 patients (3.9%) were diabetics, 52 patients (7.7%) were hypertensive, 20 patients (3%) had bronchial asthma, 12 patients (1.9%) had ischemic heart disease.

Post operative pain: Postoperative pain was recorded on visual analogue scale as no pain, mild, moderate and severe pain. Pain was easily relieved by using single analgesic. 88 patients (13.1%) had no pain, 525 patients (78.1%) had mild pain, 42 patients (6.2%) had moderate pain and 17 patients (2.6%) had severe pain. Residual neuralgia was seen in 5 patients which subsided within 3 months by use of non-narcotic analgesic and methylcobalmin. Acute urinary retention was seen in 34 patients.(table 3)

Table 3 postoperative pain recorded on visual analogue scale.

Intensity of pain	Number	Percentage (%)
No pain	88	13.1
Mild pain	525	78.1
Moderate pain	42	6.2
Severe pain	17	2.6

Other postoperative complications: Seroma formation was seen in 4 patients and hematoma was seen in 1 patient who was relieved by aspiration by disposable needle of 18G. Superficial surgical site infection was seen in 6 patients. Residual neuralgia was seen in 5 patients. Transient scrotal

swelling was noticed in 12 patients who were relieved by use of scrotal support. In follow up, none of the patients had ischemic orchitis, testicular atrophy, mesh rejection and mortality. Recurrence was seen in 2 patients.(figure 2)

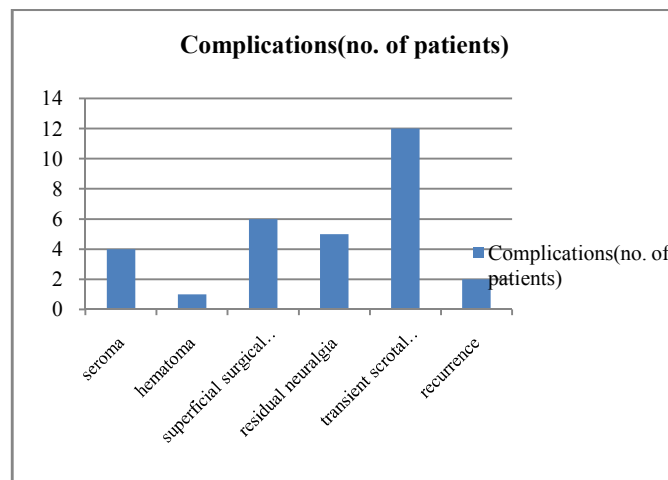


Figure 2 complications following Lichtenstein tension free mesh hernioplasty.

DISCUSSION

An abdominal hernia is a defect in the wall of abdominal cavity that allows protrusion of an organ or abdominal content through it. These defects most commonly involve the anterior abdominal wall, particularly at sites considered weak such as inguinal, femoral and umbilical areas. Approximately 75% of hernias occur in the groin region. [12] The description of Lichtenstein tension free mesh repair opened a new era in groin hernia repair. [7] Postoperative pain is minimal, as a result of the tension free technique. The method is very simple, effective and is associated with very low recurrence rates (ranging from 0-2% in the literature) and can be performed under local or regional anaesthesia [13-15].

A variety of prosthetic mesh is available to the surgeon. The ideal mesh properties are inertness, resistance to infection, molecular permeability, pliability, transparency, mechanical integrity and biocompatibility. Monofilament mesh is most popular presently in use with various types of polypropylene having different characteristic advantages. [15]

95% of patients are male and in men the incidence rises from 11 per 10,000 persons aged 16-24 years to 200 per 10,000 persons aged 75 and above. In our study 97% of patients were male and 3% were females with mean age of 48.4 years. Men are 25 times more likely to groin hernia than women. An indirect inguinal hernia is the most common hernia regardless of gender. In men, indirect hernias predominate over direct at a ratio of 2:1. Indirect inguinal hernia occur more commonly on right side which can be attributed to a delay in atrophy of processes vaginalis after the normal slower descent of right testis to scrotum during fetal development.

In our study, Postoperative pain was recorded on visual analogue scale as no pain, mild, moderate and severe pain. Pain was easily relieved by using single analgesic. 88 patients (13.1%) had no pain, 525 patients (78.1%) had mild pain, 42 patients (6.2%) had moderate pain and 17 patients (2.6%) had severe pain. Several components of hernia surgery bring about pain. Its effect is the combination of dissection and inflammation, causing nociceptor stimulation and nerve injury. the normal inflammation encountered in the surgical field is wound healing. Complications like infection and hematoma

allow inflammatory mediators to lower threshold of nociceptors which may enhance pain.^[16,17] Sutures may cause ischemia, muscle contraction or nerve damage resulting in pain. This is corroborated by the fact that removal of sutures can be effective treatment in patients with pain.^[18,19]

In our study urinary retention was seen in 34 patients (5%). This complication after hernia repair has a reported incidence of 1.3 to 5.8%. It is usually precipitated in elderly patients, especially if symptoms of prostatism are present.^[20]

Seroma formation was seen in 4 patients and hematoma in 1 patient and was relieved by aspiration by disposable needle of 18G. It is a common complication after surgery, the incidence being in the range of 5-25%. They are specially seen after large indirect hernia repair. Most resolve spontaneously over 4-6 weeks. A seroma can be avoided by minimizing dissection of the hernia sac from cord structures.^[20] superficial surgical site infection was seen in 6 patients but not associated with mesh infection. Incidences of mesh-related infection after hernia repair of up to 8% have been reported. The rate of infection is influenced by underlying comorbidity like diabetes, immunosuppression or obesity.^[21]

In our study recurrence was seen in 2 patients (0.29%). The Lichtenstein repair is considered gold standard against which other repairs are compared. Results from various studies show a recurrence rate less than 0.5% which was observed in our study. Early recurrence is mainly due to failure on part of surgeon like technical error or tension on suture line and by infection. Late recurrence results from defects in collagen metabolism as the patient ages, with thinning of scar tissue and continued inherent weakness of inguinal floor.

CONCLUSION

Many studies have observed that Lichtenstein tension-free mesh inguinal hernia repair is simple, safe, effective and economical and has good patient satisfaction and also recurrence rate is acceptable. In our opinion this procedure is the preferred method for hernia repair.

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