



### Araştırma/Research

## Evaluation of 335 inguinal hernia repair by Lichtenstein technique: a retrospective study

Tayfun Bilgiç

Acibadem Kadıköy Hastanesi, Genel Cerrahi Kliniği, İstanbul Hastanesi

### Abstract:

**Aim:** The aim of this retrospective study was to evaluate of 335 inguinal hernia repair by Lichtenstein technique in elective inguinal hernia management.

**Materyal and Methods:** Three hundred fifty-five patients who administered to the General Surgery Clinic between Jan 2004 and Jan 2006 underwent inguinal hernia repair with the “Lichtenstein-tension-free” surgery technique were retrospectively evaluated in respect to demographics, recurrence and postoperative complications. Follow-up data were obtained from hospital charts, recurrence and late complications were evaluated in telephone interview.

**Results:** 313 patients out of 355 were (88.2%) men and 42 (11.8%) were women. The mean age was 54 years (ranged 21-76 years). The hernia was on the right side in 241 patients (67.9%) and on the left side in 91patients (25.6%). 194 of 355 (54.7%) patients have indirect hernia. The postoperative mean hospital stay was 1.1 days (range 1-3 days). The most common postoperative early complication was urinary retantion. The late period complications including chronic pain in 3 patients (0.8 %), testicular atrophy in 2 patients (0.5 %), and recurrence in 4 patients (1.1%).

**Conclusion:** this study shown that Lichtenstein technique for inguinal hernia repair is a safe and feasible surgery method in respect to 1.1% recurrence and 22.6% overall post-operative complication rate.

**Key Words:** Inguinal hernia; Lichtenstein-tension-free technique; complications.

#### Yazışmadan Sorumlu Yazar

Tayfun Bilgiç  
Acibadem Kadıköy Hastanesi, Genel Cerrahi Kliniği,  
İstanbul Hastanesi  
Tel: (+90) 532 655 7134  
Email: [tbilgic77@gmail.com](mailto:tbilgic77@gmail.com)

Doi:10.30569.adiyamansaglik.474539

Geliş Tarihi: 24.10.2018

Kabul Tarihi: 05.03.2019

---

## Lichtenstein Tekniđi İle 335 İnguinal Herni Onarımının Deđerlendirilmesi: Retrospektif Bir Çalıřma

### Öz

**Amaç:** Bu çalıřmanın amacı kliniđimizde inguinal herni nedeniyle opere edilen hastaların analizini yapmak ve hastanın hastanede kalıř süresini, post operatif rahatsızlıđını, iyileřme süresini ve “Lichtenstein-tension-free” gerilimsiz greft ile herni tamiri operasyon yönteminin erken ve geç komplikasyonlarını tespit etmektir.

**Yöntem:** Genel Cerrahi Kliniđi’ne son 24 ay içerisinde bařvuran ve inguinal herni tanısı ile “Lichtenstein-tension-free” ameliyat yöntemi ile opere edilen 355 hasta çalıřmaya dahil edilmiřtir.

**Bulgular:** Çalıřmaya alınan hastalardaki ameliyat eksplorasyon bulgusu deđerlendirildiđinde 194 (%54.7) hastada indirekt, 102 (%28.8) hastada direkt, 24 (%6.7) hastada pantolon ve 35 (%9.8) hastada femoral herni olduđu saptandı. Postoperatif takip edilen hastalarda görülen erken komplikasyonlardan en sık spinal anesteziye bađlı geliřen idrar retansiyonu (25 hasta, %7) gözlandı. Çalıřmaya dahil edilen hastaların geç dönem komplikasyonları sorgulandıđında; 3 hastada nöralji (%0.8), 2 hastada (%0.5) testiküler atrofi, 1 hastada (%0.2) mesh reaksiyonu ve 4 hastada nüks (%1.1) saptandı.

**Sonuç:** Lichtenstein yöntemi modern ameliyat yönteminin gerektirdiđi tüm istekleri karřılar ve neredeyse sıfıra yakın nüks oranı bulunmaktadır.

**Anahtar Kelimeler:** İnguinal herni; Lichtenstein-tension-free tekniđi; komplikasyon.

---

## Introduction

Inguinal hernias account for 75% of abdominal wall hernias (1). Surgery is the only effective treatment modalities of inguinal hernias and inguinal hernia repair is the most common procedure in general surgery (2). More than a century, the success of the inguinal hernia surgery has been evaluated with the recurrence rate (3). Tension-free methods of hernia repair are divided into anterior and posterior, according to mesh placement in relation to the transverse fascia. The tension free repair, introduced by Irving Lichtenstein is placed in the category of anterior hernioplasties (4,5). This technique caused a dramatic drop in the recurrence rate and became the procedure of choice. Currently it is accepted as the gold standard for open, mesh-based inguinal hernia repair (5-7).

The aim of this retrospective study was to evaluate of 335 inguinal hernia repair by Lichtenstein technique in elective inguinal hernia management.

## Materials and Methods

355 patients who underwent inguinal hernia repair by “Lichtenstein-tension-free” surgery technique in the General Surgery Clinic between Jan 2004 and Jan 2006 were included in the study. Follow-up data were obtained from hospital charts, recurrence and possible late complications were evaluated in telephone interview. The same surgeon performed all the interviews.

The data including sex, age, comorbid disease, anesthesia type, inguinal hernia side, the hernia type, hospital stay, and the early and late complications of the patients. Patients who could not be contacted after discharge were not included in the the study. The Statistical Package for the Social Sciences (SPSS) 15 for Windows (SPSS® Inc. Chicago, IL, USA) program was used in the statistical analysis. The Chi-square test was used in the comparison of the qualitative data in addition to the descriptive statistical methods (frequency) in the evaluation of the study data. The significance value of  $p < 0.05$ .

## Results

313 patients out of 355 were (88.2%) men and 42 (11.8%) were women. The mean age was 54 years (ranged 21-76 years). 18 of 355 patient had previous inguinal hernia repair. Considering the comorbidities, 42 (11.8%) patients had hypertension, 32 (9%) had diabetes, 35 (9.8%) had

chronic obstructive pulmonary disease, and 24 (6.8%) had diagnosed with ischemic heart disease.

The hernia was on the right side in 241 patients (67.9%) and on the left side in 91 patients (25.6%), and bilateral hernia was detected in 23 patients (6.5%). Indirect hernia was detected in 194 patients (54.7%), direct hernia was detected in 102 patients (28.8%), pantaloona hernia was detected in 24 patients (6.7%) and femoral hernia was detected in 35 patients (9.8%). Surgery was performed under one of three following anesthesia techniques, spinal anesthesia (n=226, 63.7 %) epidural anesthesia (n=75, 21.1%) and general anesthesia (n=54, 15.2%). Type of anesthesia was determined by the anesthesiologists.

The postoperative mean hospital stay was 1.1 days (range 1-3 days). The mean hospital stay in patients who experienced seroma and hematoma was 2 and 3 days respectively.

In the present study overall complication rate were 22.6%. The most common postoperative early complication was urinary retention which required urinary catheterization (25 patients, 7%). The other complications were infection (6 patients, 1.7%), seroma (18 patients, 5%), hematoma (8 patients, 2.2%), and scrotal edema (3 patients, 0.8%) (Table 1). 18 of 355 patients had previous inguinal hernia repair. 18 of 355 (5%) patients experienced seroma, 15 of those 18 patients had previous inguinal hernia repair. No additional intervention was required for these patients after 20-25 ml seroma aspiration. 6 of 355 (1%) patients experienced surgical area infection. They were treated with antibiotics and abscess drainage, excision of the mesh was required in 1 patient.

**Table 1.** Early complications.

Early Complications	Number	%
Urinary retention	25	7
Seroma	18	5
Hematoma	8	2.2
Scrotal edema	18	5
Surgical area infection	6	1

The late period complications including chronic pain in 3 patients (0.8 %), testicular atrophy in 2 patients (0.5 %), and recurrence in 4 patients (1.1%) (Table 2).

**Table 2.** Late complications.

Late Complications	Number	%
Chronic pain	3	0.8
Testicular atrophy	2	0.5
Recurrence	4	1.1

Three patients who developed scrotal edema were recurrent scrotal hernia patients. They required wide dissection. Local anti inflammatory pomades and testicular elevation with suspensory pants were applied for treatment of scrotal edema. The scrotal edema diminished within 5-7 days.

No additional intervention was performed to three patients with pain due to performed hernia repair using propylene mesh in the inguinal region, and with paresthesia symptoms on thigh, and symptomatic treatment was given.

## Discussion

The present study show that the inguinal hernia repair by Lichtenstein-tension-free graft technique is a reliable and successfull method regarding the hospital stay time of the patients and postoperative both early and late complications. Furter the recurrence rate is almost close to zero.

Inguinal hernia can occur in both sexes, but it primarily affects men (8). In the present study 313 patients out of 355 were (88.2%) men and 42 (11.8%) were women.

Inguinal hernias were reported to be mostly detected in the right side in the previous studies, and 60-65% of all hernias were indirect and 30-35% were direct hernia (1,9). Kingsnorth and LeBlanc (1) reported in their review in 2003 with 476 patients that 439 were inguinal hernia, 37 were femoral hernia, and the direct/indirect hernia rate was reported as 13 folds. In the present study hernia was detected on the right side in 241 patients (67.9%) and on the left side in 91patients (25.6%), and bilateral hernia was detected in 23 patients (6.5%). Indirect hernia was detected in 194 patients (54.7%), direct hernia was detected in 102 patients (28.8%), pantoloon hernia was detected in 24 patients (6.7%). The prevalence of femoral hernia in the population is approximately 10% (10 ). The detection rate of femoral hernia was found

---

compatible with the literature with a rate of 9.8%.

Generally the surgical treatment of inguinal hernia needs short duration hospital stays, the post-operative complications but also the other factors that depend on the patient, can affect the post-operative course (11). In the present study postoperative hospital stay was 1,1 days (range 1-3 days). The mean hospital stay in patients who experienced seroma and hematoma was 2 and 3 days respectively.

The overall risk of complications after inguinal hernia operations 15 to 28% in systematic reviews (12). In the present study overall complication rate were and 22.6% which similar to previous report (12).

In the present study the most common postoperative early complication was urinary retention which required catheterization 25 of 355 (7%). Prakash et al (13) evaluated the effectiveness of local anaesthesia when compared to spinal anaesthesia in individuals undergoing open inguinal hernia repair in systematic review and meta-analysis. Patients in the local anaesthetic group experienced significantly lower rates of urinary retention [FEM, RR 0.03 (95% CI 0.01-0.08),  $p < 0.01$ ]. Local anesthesia was not preferred technique in our clinic. Type of anesthesia determined by the anesthesiologist and spinal anesthesia is the most popular technique for inguinal hernia surgery. But, 25 patients who required catheterization due to urinary retention underwent surgery under spinal anesthesia in the present study.

The risk of seroma formation reported between 0.5 and 12.2% after inguinal hernia repair (505). 18 of 355 (5%) patient experienced seroma, 15 of those 18 patients had previous inguinal hernia repair. No additional intervention was required for these patients after 20-25 ml seroma aspiration.

Three patients who developed scrotal edema were recurrent scrotal hernia patients in the present study. They required wide dissection. Local anti inflammatory pomades and testicular elevation with suspensory pants were applied for treatment of scrotal edema. The scrotal edema diminished within 5-7 days.

No additional intervention was performed to three patients with pain due to performed hernia repair using propylene mesh in the inguinal region, and with paresthesia symptoms on thigh, and symptomatic treatment was given.

Infection developed in 6 (1.7%) patients, and excision of the mesh was required in 1 patient in our study. Mesh infection reported as high as 10 % following hernia repair previously (14,15). Intravenous antibiotics and excision of mesh form key stones in the management of mesh

---

infection (16). In the present study aseptic technique and perioperative prophylactic antibiotics were used. Incidence of infection was low and only 1 of 6 infected patient required mesh excision in our study.

Inguinal hernia surgery can cause damage to different nerves which can cause chronic pain (17). Chronic postsurgical pain has been defined as pain that develops after surgical intervention and lasts for at least 2 months, other causes of pain excluded(18,19) The etiology of chronic pain is multifactorial and no definitive treatment algorithm exists (18). Chronic pain were seen 3 patients (0.8 %) in the present study.

The use of mesh causing infertility is becoming a growing concern after inguinal hernia repair (17). In a meta-analysis of randomized studies of lightweight mesh vs heavyweight mesh, the incidence of testicular atrophy was reported as 0.8% irrespective of repair method (20,21). In the present study testicular atrophy rate were similar to literature and seen in 2 patients (0.5 %). The success of the inguinal hernia surgery has been evaluated with the recurrence rate more than a century (3). Eklund et al.(22) compare a laparoscopic (totally extraperitoneal patch (TEP)) and an Lichtenstein technique for inguinal hernia repair regarding recurrence rate in their multicenter randomized study. The authors conclude that both techniques offer low recurrence rates, with the cumulative recurrence rate was 3.5% in the TEP group and 1.2% in the Lichtenstein group (P = 0.008). In our study the recurrence rate were 1.1%. this result were similar with the Eklund et al.(22) study.

As a conclusion this study shown that Lichtenstein technique for inguinal hernia repair is a safe and feasible surgery method in respect to 1.1% recurrence and 22.6% overall post-operative complication rate.

## References

1. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. *Lancet* 2003;362(9395):1561-71.
2. Palermo M, Acquafresca PA, Bruno M, Tarsitano F. Hernioplasty with and without mesh: analysis of the immediate complications in a randomized controlled clinical trial. *Arq Bras Cir Dig* 2015;28(3):157-60.
3. Amid PK, Lichtenstein IL. Current assessment of Lichtenstein tension-free hernia repair. *Chirurg* 1997; 68(10):959-64.

4. Pielaciński K, Wróblewski T, Wójtowicz J. Results of inguinal hernia repair by Lichtenstein method in material of Surgical Ward of the District Hospital in Żyrardow. *Videosurgery Miniinv* 2007;2(6):66–75.
5. Liu Y, Shen Y, Chen J. Effects of non-woven mesh in preperitoneal tension-free inguinal hernia repair: a retrospective cohort study. *Minerva Chir* 2017;72(4):311-6.
6. Reinpold W, Chen D. Evidence-based Lichtenstein technique. *Chirurg* 2017;88(4):296-302.
7. Lichtenstein IL, Shulman AG, Amid PK, Montlor MM. The tension-free hernioplasty. *Am J Surg* 1989; 157(2):188-93.
8. Rahul B.G, Ravindranath G.G. Incidence of inguinal hernia and its type in a study in a semiurban area in Andhra Pradesh, India. *Int Surg J* 2016;3(4):1946-9.
9. Ruthlege RH, Cooper's Ligament repair, a 25 year expriens with a single technique for all groin hernias in adults, *Surgery* 1988;103: 1-10.
10. Arat IR, Fıtklar, in: Değerli Ü (Ed) Genel Cerrahi. İst, Ed, İstanbul Tıp Fak, 461-88.
11. S Aldoescu, T Patrascu, I Brezean. Predictors for length of hospital stay after inguinal hernia surgery. *J Med Life* 2015; 8(3): 350–5.
12. Simons MP, Aufenacker T, Bay-Nielsen M, and et all. European Hernia Society guidelines on the treatment of inguinal hernia in adult patients. *Hernia*. 2009; 13(4): 343–403.
13. Prakash D, Heskin L, Doherty S, Galvin R. Local anaesthesia versus spinal anaesthesia in inguinal hernia repair: A systematic review and meta-analysis. *Surgeon* 2017;15(1):47-57.
14. Narkhede R, Shah NM, Dalal PR, Mangukia C, Dholaria S. Postoperative Mesh Infection— Still a Concern in Laparoscopic Era. *Indian J Surg* 2015;77(4):322-6.
15. Paton BL, Novitsky YW, Zerey M, Sing RF, Kercher KW, Heniford BT. Management of infections of polytetrafluoroethylene-based mesh. *Surg Infect (Larchmt)* 2007;8(3):337–41.
16. Serbetci K, Kulacoglu H, Devay AO, Hasirci N. Effects of reesterilization on mechanical properties of polypropylene meshes. *Am J Surg* 2007;194(3):375-9.
17. Zhiyong Dong, Stacy Ann Kujawa, Cunchuan Wang, Hong Zhao. Does the use of hernia mesh in surgical inguinal hernia repairs cause male infertility? A systematic review and descriptive analysis. *Reprod Health*. 2018; 15: 69.
18. Martin F Bjurstrom, Andrea L Nicol, Parviz K Amid, David C Chen. Pain control following inguinal herniorrhaphy: current perspectives. *J Pain Res* 2014;7: 277-90.
19. Macrae WA, Davies HTO. Chronic postsurgical pain. In: Crombie IK, Croft PR, Linton SJ, LeResche L, Von Korff M, editors. *Epidemiology of Pain*. Seattle: IASP Press; 1999. pp. 125–142.
20. Nordin P, van der Linden W. Volume of procedures and risk of recurrence after repair of groin hernia: national register study. *BMJ* 2008;336(7650):934–7.
21. The HerniaSurge Group Hernia. International guidelines for groin hernia management 2018; 22(1): 1–165.
22. Eklund AS, Montgomery AK, Rasmussen IC, Sandbue RP, Bergkvist LA, Rudberg CR. Low recurrence rate after laparoscopic (TEP) and open (Lichtenstein) inguinal hernia repair: a randomized, multicenter trial with 5-year follow-up. *Ann Surg*. 2009;249(1):33-8.