

A 48-Year-Old Man with Reducible Right Scrotal Hernia: A Case Report

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ABSTRACT

Scrotal hernias, a continuation of inguinal hernias into the scrotum, are more prevalent in developing countries (67%) compared to developed nations (6%). Risk factors include age, occupation, gender, and prior surgical history. This case report examines a 48-year-old male with a reducible right scrotal hernia, highlighting diagnostic and therapeutic approaches. The study aims to present a detailed case of scrotal hernia, emphasizing clinical presentation, diagnostic methods, and surgical management to contribute to improved patient outcomes. A case study approach was employed, involving comprehensive anamnesis, physical examination, and supporting diagnostics (laboratory tests, ECG, and thorax imaging). The patient underwent herniotomy, herniorrhaphy, and hernioplasty using the Lichtenstein Tension-Free Repair technique, followed by postoperative monitoring. The patient exhibited a 7 × 5 × 3 cm reducible mass in the right scrotum, with no signs of inflammation or complications. Surgical intervention successfully addressed the hernia, with postoperative recovery monitored over two follow-up visits. Laboratory results indicated mild leukocytosis but were otherwise unremarkable. Early detection and surgical intervention are critical in managing scrotal hernias to prevent complications such as incarceration or strangulation. The Lichtenstein technique proved effective, underscoring the importance of tailored surgical approaches. This case adds to the literature on hernia management in resource-limited settings.

KEYWORDS Scrotalis Hernia, Herniotomy, Herniorraphy, and Hernioplasty



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INTRODUCTION

One of the diseases that affects health and requires surgical treatment is a hernia. A hernia is a defect that contains a protrusion of the cavity or a weakness in the wall of the cavity in question. A hernia that enters the inguinal canal and passes through the external *anulus*, continuing into the scrotum, is called a *scrotalis hernia* (Paul Engbang et al., 2021, 2022; Sjamsuhidajat et al., 2017; Soriba Naby et al., 2020).

The number of hernia surgeries worldwide is approximately 20 million patients every year. The prevalence of *scrotalis hernia* in developed countries is 6%, while in developing countries, it is around 67%. As many as 75% of hernia cases occur in the inguinal area (thigh-hip region), including lateral inguinal hernias, femoral hernias, and medial inguinal hernias; ventral hernias account for 10%, incisional hernias 10%, umbilical hernias 3%, and other types of hernia 3% (Brunicardi, 2015; Rather, 2023).

Based on the process of hernia formation, they are classified into two types: congenital hernias (*congenital*) and acquired hernias (*acquired*). Hernia classification based on location is named according to its anatomical site, such as *scrotalis*, inguinal, diaphragm, abdominal, femoral, and other hernias. Based on their nature, hernias are divided into two categories: reducible hernias (when the contents of the hernia can protrude, especially when the patient stands or moves, and reduce when lying down or pushed back into the abdomen) and irreducible hernias (when the contents of the hernia sac cannot be repositioned or returned to the abdominal cavity) (Hammoud & Gerken, 2022).

Based on research conducted by Kockerling (2020), a total of 2,710 patients with *scrotalis hernias* had predisposing factors such as age, increased BMI (obesity and overweight), male gender, constipation, previous surgical history, and occupation. Hernias, particularly inguinal and *scrotalis* types, represent a significant global health burden, with approximately 20 million surgeries performed annually worldwide. According to Brunicardi (2015), inguinal hernias account for 75% of all abdominal wall hernias, with a striking disparity in prevalence between developed (6%) and developing countries (67%). This discrepancy has been attributed to factors such as limited access to healthcare, occupational hazards, and delayed diagnosis in resource-limited settings. Recent epidemiological studies by Engbang et al. (2021) in Cameroon further highlight how socioeconomic factors and healthcare infrastructure influence hernia presentation and outcomes, reinforcing the need for context-specific management strategies. The high incidence in developing nations underscores the importance of improving diagnostic and surgical approaches to reduce complications and healthcare costs.

Despite extensive research on hernia management, significant gaps remain in understanding the optimal surgical techniques for *scrotalis hernias* in middle-aged patients from low-resource settings. While the Lichtenstein tension-free repair has become the gold standard for inguinal hernias in many high-income countries (Hassler et al., 2022), its application and outcomes in *scrotalis hernias*—particularly in regions with limited surgical infrastructure—are less documented. Research by the HerniaSurge Group (2018) provides comprehensive guidelines for groin hernia management but acknowledges the lack of tailored recommendations

for complex or neglected cases commonly seen in developing nations. This gap highlights the need for more case-based evidence to guide surgeons in resource-constrained environments where advanced techniques may be adapted differently.

The urgency of addressing *scrotalis hernias* lies in their potential for severe complications, including incarceration and strangulation, which significantly increase morbidity and mortality. Kockerling's (2020) study of 2,710 *scrotalis hernia* cases identified age, obesity, and manual labor as key risk factors, all of which were present in the current case. Such patients often present late due to limited healthcare access or cultural barriers, exacerbating the risk of irreversible tissue damage. In Indonesia, where this case was reported, the burden of neglected hernias remains high, with many patients relying on emergency services when complications arise. Timely surgical intervention is critical to prevent life-threatening sequelae, yet regional disparities in surgical capacity persist, making research on adaptable techniques a priority.

This study introduces novelty by detailing the successful application of the Lichtenstein technique for a chronic, reducible *scrotalis hernia* in a middle-aged manual laborer—a demographic underrepresented in existing literature. While most studies focus on primary inguinal hernias or complex incarcerated cases (Olanrewaju et al., 2023), this report bridges the gap by documenting a "middle-ground" scenario where elective repair prevented complications. The case also emphasizes the role of preoperative diagnostics, such as transillumination testing, in differentiating *scrotalis hernias* from hydroceles or tumors—a diagnostic challenge noted by Sjamsuhidajat (2017) but rarely explored in clinical reports. By integrating these elements, the study offers a pragmatic template for surgeons in similar settings.

The primary purpose of this research is to demonstrate the feasibility and outcomes of open tension-free hernioplasty in a resource-limited setting, while secondary objectives include highlighting diagnostic pitfalls and postoperative care strategies. Hatewar et al. (2024) recently advocated for minimally invasive approaches, but such techniques remain inaccessible in many regions. This case reaffirms the value of open repairs when performed systematically, aligning with the resource realities of low- and middle-income countries. Additionally, the study aims to reinforce the importance of patient education and follow-up, as poor adherence to postoperative protocols remains a barrier to recovery in underserved populations.

The benefits of this research extend beyond the individual case, offering actionable insights for clinicians managing similar presentations in comparable settings. By documenting a successful outcome with conventional techniques, the study provides evidence to guide surgical decision-making where advanced equipment is unavailable. Policymakers may also use these findings to advocate for

targeted hernia screening programs in high-risk occupational groups, such as manual laborers. Furthermore, the detailed methodological account—from diagnostics to surgical execution—serves as an educational resource for trainees in regions with high hernia prevalence.

RESEARCH METHOD

This study employed a qualitative case report design to provide an in-depth analysis of a single case of reducible right scrotal hernia in a 48-year-old male patient. The research focused on documenting the clinical presentation, diagnostic process, and surgical management of the condition. Case reports are particularly useful for rare or illustrative cases, offering detailed insights that can inform clinical practice. The study adhered to ethical guidelines, ensuring patient confidentiality and informed consent.

The data population consisted of the patient's medical records, including history, physical examination findings, laboratory results, imaging studies (ECG and thorax X-ray), and surgical documentation. The data sample was purposively selected, as the case represented a typical presentation of scrotal hernia with clear diagnostic and therapeutic relevance. Sampling technique was not applicable in the traditional sense, as the study centered on a single case; however, the selection was justified by the case's educational and clinical value.

Research instruments included standardized medical examination protocols, laboratory tests (complete blood count, coagulation profile, and clinical chemistry), and imaging modalities. Data were analyzed descriptively, focusing on clinical progression, diagnostic findings, and surgical outcomes. The data analysis technique involved thematic synthesis of medical records, imaging interpretations, and postoperative follow-up notes to draw conclusions about the effectiveness of the Lichtenstein Tension-Free Repair technique. This approach ensured a comprehensive understanding of the case and its implications for hernia management.

RESULT AND DISCUSSION

CASE REPORT

A 48-year-old man came to the emergency room of Hardjono S. Ponorogo Hospital on June 16, 2024 at 22.00 with complaints of a lump in the right testicle since 10 years ago. These complaints disappear arise, the lump appears and enlarges when the patient coughs, lifts heavy weights and strains, however, the lump disappears when the patient sleeps or lies down. Since 1 year before entering the hospital, the patient was taken to the health center to check his condition, but the patient did not feel better.

No lumps were found in other places such as on the axis, the KGB neck and others. Complaints that accompany when the lump comes out are nausea and vomiting (-), pain (-), flatulence (-), bowel disorders (-), urination disorders (-), and fever (-). The patient has a habit of lifting heavy weights in the workshop. A history of other diseases such as hypertension, diabetes mellitus, asthma, trauma, CHD and others are denied by the patient. The patient has no history of drug allergy. The patient's habit history is smoking and consuming alcohol.

The patient works as a mechanic in the workshop every day and the patient's wife opens a laundry business. Patients do not have difficulty in meeting daily needs such as food needs, school needs and other household needs

In the physical examination, it was found that the general condition was good, GCS composite mentis E4V5M6, BB 60 Kg, TB 170 cm. So, a BMI of 20 (normal) was obtained. From the results of the vital sign examination, TD: 120/70 mmHg, HR: 70 x/min, RR: 20 x/min, T: 36^{0C}, SpO₂: 99%

The patient was transferred to the flamboyant ward after the patient was observed in the emergency room. Based on the results of the generalist status examination conducted in the ward, it was found that the head (normocephal, jejas (-), deformity (-), palpebra edema (-/-) conjunctival anemis (-/-), icteric sclera (-/-), PCI (-/-), symmetrical face, edema face (-/-), nose dbn (nasal mucosa not found hyperemic, edema, concha hypertrophy, and secret), ear dbn (auriclea dbn, field CAE, hyperemis (-), furunkel (-), cerumen (+), MT intake), enlargement of KGB (-), and enlargement of the thyroid (-). In the pulmo examination, inspections were obtained (normochest, symmetrical, no chest wall limitation/retraction (-)), palpation (symmetrical motion, vocal fremitus is equally strong in both hemithorax), percussion (sonor +/+), and in pulmo auscultation obtained (SDV (+/+), RH (-/-), and Wheezing (-/-)).

Abdominal examination was obtained by symmetrical abdominal inspection, scarring/striae (-), and venous dilation (-). Abdominal auscultation is obtained by intestinal noise (+) and peristaltic movements (dbn). From the results of abdominal palpation, it was obtained that the palpation was supel, the liver and lien were not palpable, and the rebound sign (-). In the percussion examination, tympanies were obtained in all four abdominal quadrants, there was no CVA and ballotement (-) tapping pain.

The patient's genitalia examination showed that the penis (dbn) and testicles amounted to 2. From the examination of the extremities, CRT was obtained < 2 seconds, warm akral in all four extremities and no edema was found in the superior and inferior extremities.

Based on the examination of the localized status of scrotalis dextra and the patient is asked to strain, it is obtained:

Table 1. the examination of the localized status

Scrotalis dextra	Scrotalis sinistra
Inspection: It was found that there was a round mass, when the patient strained the mass with a size of 7x5x3 cm. The color of the mass is the same color as the surrounding skin. No signs of inflammation were found. Palpation: the presence of a round mass in the dextra's scrotum, no tenderness was found during palpation and enlargement of the KGB (-). There were 3 examinations carried out such as the ziemen test (a lump was found on the second finger when the patient was strained), a finger test (a lump was found on the tip of the index finger) and a thumb test (no lump was found). Additional inspection by conducting a translumination check (negative translumination was found).	Inspection Within normal limits, mass (-), and edema (-) Palpation: Pain (-), lump (-), enlargement of the KGB (-).



Figure 1. status of scrotalis dextra

From the results of laboratory examinations, it was obtained:

Table 2. the results of laboratory examinations

Examination	Result	Reference Value
Complete Blood		
Hemoglobin	13.4	13.2 - 17.3
Red blood cell	4.15 (Low)	4.4 - 5.9
Leukosit	16.54 (High)	4.1 – 10.9
- Hematocrit	39.2	36.0 – 56.0
- Platelet	303	150 – 450
- MCV	94.6	80.0 – 100.0
- MCH	32.3	28.0 – 36.0
- MCHC	34.2	31.0 – 37.0
RDV-CV	12.1	10.0 – 16.5

Examination	Result	Reference Value
- PDW	10.2 (Low)	12.0 – 18.0
- MPV	7.4	5.0 – 10.0
- PCT	0.22	0.10 – 1.0
Calculate Type		
Eosinofil	1.5	0.0 – 6.0
Basophils	0.6	0.0 – 2.0
Neutrofil	62.7	42.0 – 85.0
Lymphocytes	26.9	11.0 – 49.0
Monosit	8.3	0.0 – 9.0
Neutrofil Abs	10.34	
Abs Lymphocytes	4.4	
NLR	2.35	
Clinical Chemistry		
Glucose Strip	130	
Coagulation		
PPT	9.6	8.4 – 13.2
APPT	27.4	25.4 – 38.4
INR	0.91	0.9 – 1.1
Immunology		
HbsAg Confirmation (ECLIA)	Non Reactive	Non Reactive
R1 Anti HIV Oncoprobe	Non Reactive	
R2 Anti HIV Rapidan Tester	Not worked on	
Clinical Chemistry		
Creatinin	0.94	0.6 – 1.3

An overview of the ECG examination is obtained:

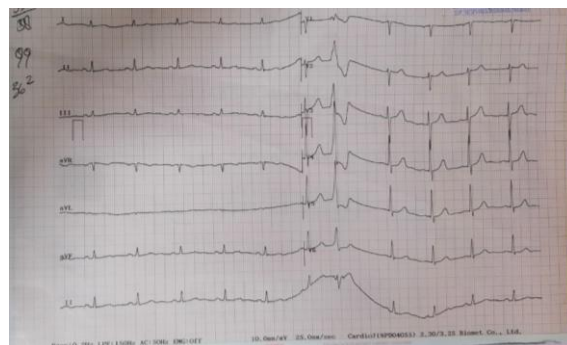


Figure 2. overview of the ECG examination

The results of the thorax photo examination were obtained:



Figure 3. The results of the thorax photo examination

Table 3. the results of anamnesis, physical examination and supporting examination,

Airway:	- tracheal deviation (-), - Bilateral hilus lymphonody compaction (-)
Breathing:	- Broncovascular casts dbn - Both apex pulmo net - Shadow of opak and semi-opak in both lung fields (-)
Circulation:	- CTR < 50% - Conus pulmonalis does not stand out
Diaphragm	- Domes shaped shape - Hemidiafragma bilateral licin - Sudut costophrenicus dekstra et sinistra tajam
Everything else:	- Sisterna bone well visualized - Soft tissue swelling (-) - Bone discontinuity (-)

From the results of anamnesis, physical examination and supporting examination, it was concluded that the diagnosis in the patient was a dextra repinible scrotalis hernia with a differential diagnosis of dextra hydrocele and testicular tumors. The patient was given medicamentosa therapy such as Inf. NaCl 0.9% 20 tpm, Inj. Ketorolac 30 mg 3x1 Amp, Inj. Ranitidine 50mg 2x1 Amp, Inj. Anbacim 2 gr and non-medica mentosa such as herniotomy, hernioraphi, and hernioplasty with Lichtenstein Tension free technique.

Documentation of surgery in patients with scrotalis hernia:

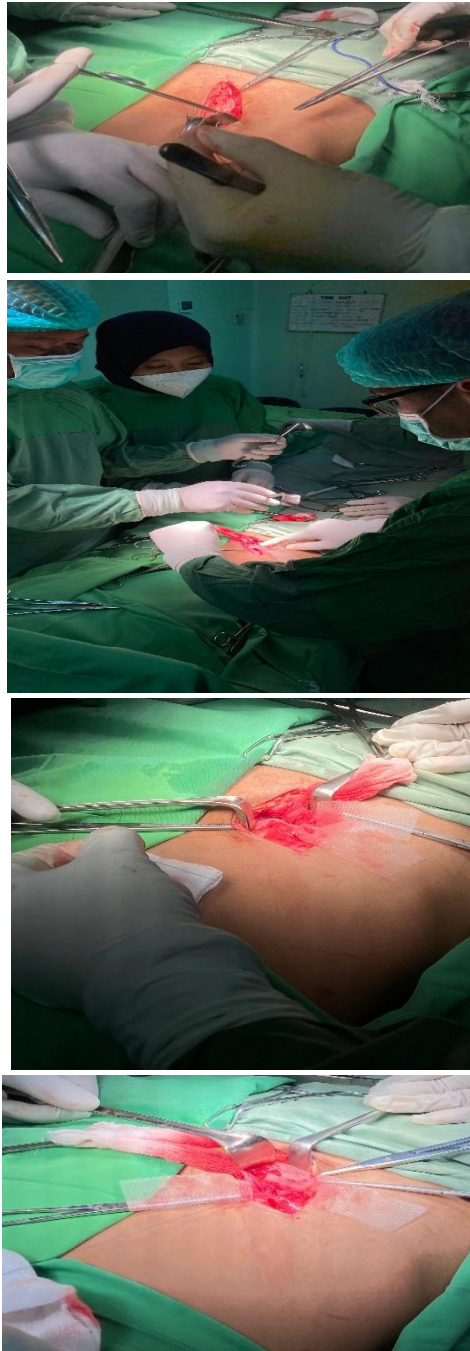


Figure 4. documentation of the surgery

Follow up the surgery post on June 20, 2024, subjective data on pain in the surgical scar (+), nausea (-), vomiting (-), objective data is sufficient, TD 107/70 mmHg, RR: 20x/min, HR: 76x/min, T: 36.5°C Localized status of the dextra inguinal region: Sutures approximately 6 cm long, pus (-), blood (+), redness (+). The management provided was in the form of Inf. NaCl 0.9% 20 tpm, Inj. Ketorolac 30 mg 3x1 Amp, Inj. Axle. Tranexamic 500 mg 3x1 Amp and medicamentosa with

wound care. For medication to go home, patients were given cefadroxil 500 mg tab 2x1, mefenamic acid 500 mg tab 2x1.



Figure 5. The first surgical control

The first surgical control follow-up on June 27, 2024 obtained subjective data on pain in the surgical scar (+), nausea (-), vomiting (-), objective examination of my sufficient, TD: 130/70 mmHg, RR: 18x/min, HR: 80x/min, T: 36.4°C, Localized status of the inguinalis dextra: Sutures approximately 6 cm long, pus (-), blood (-), redness (+), and given cefadroxil 500 mg medicamentosa therapy tab 2x1, Mefenamic acid 500 mg tab 2x1 and non-medicamentosa therapy for wounds.



Figure 6. result pf surgery

The inguinal canal is a duct that runs obliquely (obliquely) 4 cm long and is located 2-4 cm above the inguinal ligament. The Inguinale ligament is a thickening of the axulus oblicus externus muscular aponeurosis. It is located from SIAS to the superior ramus of the pubic bone. It starts from the internal inguinal opening, extends to the medial and inferior through the lining of the abdominal wall and ends in the external inguinal opening. Its length changes throughout the growth period from childhood to adulthood. The inguinal canal serves as a pathway for transmitting the spermatic cord, gonadal vessels, and lymphatic vessels. The main components of the

inguinal canal are the funiculus spermaticus in men and the uterine rotundum ligament in women. The inguinal canal also contains blood vessels and lymphatic vessels as well as the ilioinguinal nerve in both sexes. There are two doors in the inguinal canal, namely the annulus of the inguinal inus which is located above the middle of the inguinal ligament and the lateral of the inferior epigastrum artery and the anulis inguinal externus (Sjamsuhidajat, 2017).

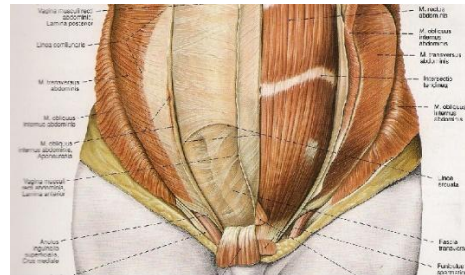


Figure 7. the middle of the inguinal ligament

The boundaries of the inguinal canal are as follows:

- Previous: Aponeurosis obliquus externus
- Superior: Musculus conjoined
- Inferior: Ligamentum inguinalis
- Posterior: Fascia transversalis dan conjoined tendon

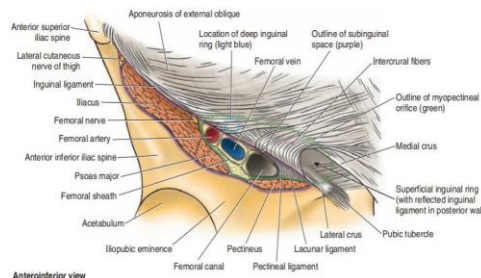


Figure 8. the lateral of the inferior epigastrum artery

A lateral inguinal hernia or also called an indirect inguinal hernia is a hernia that comes out through the inguinal annulus internus which is located laterally from the inferior epigastric vein, then the hernia enters the inguinal canal and will continue to the external inguinal annulus if the hernia is still long enough. If it continues, the protrusion will reach the scrotum and is called a scrotal hernia. Meanwhile, a diak inguinal hernia or also called a medial inguinal hernia protrudes directly forward through the Hasselbach trigonum. Boundaries of trigonum hesselbach:

- Medial: margin lateral M. Rectus abdominis
- Lateral: A. Epigastrum inferior
- Inferior: Ligamentum inguinalis

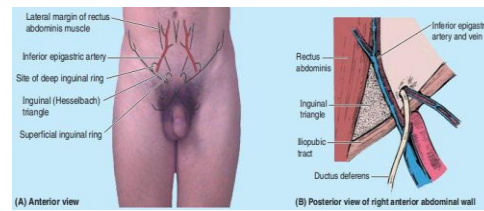


Figure 9. Boundaries of trigonum hesselbach

A hernia consists of 3 elements, namely a hernia sac consisting of peritonium, hernia contents which usually consist of the intestine, omentum, sometimes containing extraperitoneal organs such as ovaries, diverticule appendices and bulbous. The last element is the structure that covers the hernia sac which can be the skin (scrotum), umbilicus or other organs such as the lungs and so on (Hammoud & Gerken, 2022; Moore *et al.*, 2010).

The incidence of inguinal hernia in children is as high as 4.5%. Indirec hernias usually appear during the first year of life, but they often appear until middle age or old age. Indirec hernias are more common in premature babies than full-term babies, they develop in 13% of babies born before 32 weeks of gestation. The inguinal hernias the hernia with the highest incidence rate. About 75% of hernias occur in the inguinal region, 50% are indidial inguinal hernias and 25% are diac inguinal hernias (Rather, 2023; Guideline Hernia, 2018).

The etiology of an indirec hernia can be largely explained in terms of inguinal embryology and testicular dropping. In healthy people, there are three mechanisms that can prevent the occurrence of an inguinal hernia, namely (1) an oblique inguinal canal that runs obliquely, (2) a muscular structure of the oblycus internus that closes the anulus of the inguinal internus when contracting, (3) a strong transverse fascia that covers the trigonum of Hesselbach which is generally almost muscular. Risk factors that can cause hernias are the presence of collagen fiber abnormalities, obesity, increased intra-abdominal pressure due to chronic cough, obesity, chronic constipation, ascites, and the habit of lifting heavy weights (Shenoy, 2016).

Pathologically, an increase in intraabdominal pressure will push the inguinal annulus internus to be urgent. An inguinal hernia can occur due to a congenital anomaly or because factors that are seen as playing a causal role are the presence of an open vaginal process, and weakness of the abdominal wall muscles due to age. More in men than women. Various causative factors play a role in the formation of a hernia entrance in the Annulus Internus which is large enough that it can be passed through by the pouch and the contents of the hernia through the door that has opened wide enough.^{1,5} When the contents of the hernia sac can be transferred to the abdominal cavity by hernia manipulation, it is called reducible (Glance *et al.*, 2006; Guideline Hernia, 2018).

Most pediatric inguinal hernias are considered congenital due to the patented vaginal process. During normal development, the testicles descend from the abdomen into the scrotum leaving a diverticulum that protrudes through the inguinal canal and becomes the vaginal process. In normal development, the vaginal process closes around 40 weeks of gestation, eliminating the opening of the peritoneum in the internal ring. Failure of this closure can lead to indirect hernia in the pediatric population. Patent vaginal lysis process does not always cause an inguinal hernia (Hammoud & Gerken, 2022; Guideline Hernia, 2018).

In general, adult complaints are in the form of lumps in the inguinalis that arise when walking, coughing, or lifting heavy weights and disappear at rest lying down. On inspection observe the asymmetrical state of both the inguinal, scrotum, or labia in both standing and lying positions. The patient is asked to cough or cough so that a lump or asymmetrical state can be seen. Palpation is performed in the presence of a hernia lump, palpated for consistency, and tried to push whether the lump can be repositioned. After the lump can be repositioned with the index finger, sometimes the hernia ring can be palpable in the form of a dilated inguinal anulus. Pain accompanied by nausea or vomiting only arises if incarceration occurs due to ileus or strangulation due to necrosis or gangrene. A simple physical examination that can be done is a ziemen test, The right hernia is examined with the right hand, Maintain the 2nd finger on the internus anulus, the 3rd finger on the posterior wall above and laterally from the external anus and the 4th finger on the femoral anus, Ask the patient to cough or strain. If the impulse is felt on the 2nd finger, it means a lateral hernia, the 3rd finger has a medial hernia, the 4th finger means a femoral hernia. The next examination is a finger test, the 2nd or 5th finger is inserted through the scrotum through the external annulus to the inguinal canal. If an impulse is felt on the fingertips, it means that a lateral hernia has occurred. If an impulse is felt on the side of the finger, it means a medial hernia. Thumb test with thumb pressing the annulus internus. If a lump comes out, it means a medial hernia, if it does not come out.

Another test that can help rule out differential diagnoses such as hydroceles is to perform a translumination test. In a dark room, a light source is placed on the magnified side of the scrotum. Normal vascular structures, tumors, blood, hernias and testicles cannot be penetrated by radiation. Light transmission as a red shadow indicates a cavity containing serous fluid, such as a hydrocele or spermatocele. Radiological modalities including ultrasound (ultrasound), computed tomography (CT), and magnetic resonance imaging (MRI) are also used as supporting examinations in hernia cases (Sjamsuhidajat et al., 2017).

Conservative treatment in hernia cases is limited to the act of repositioning and the use of supports or supports to maintain the contents of the repositioned hernia. Repositioning is not performed in inguinal hernia strangulata, except in pediatric patients. Operative management in hernia cases includes herniotomy, hernioraphy

and hernioplasty. Hernioplasty techniques in hernia patients consist of bassini technique, Lichtenstein tension free repair and shouldice (Hassler *et al.*, 2022).

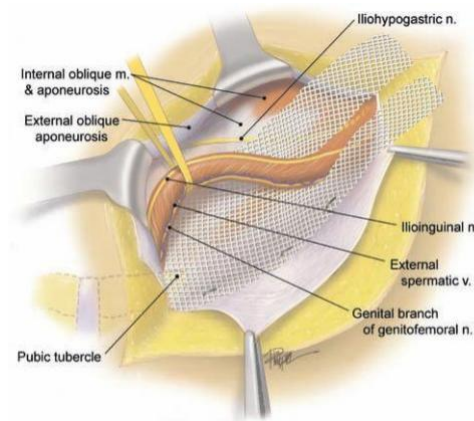


Figure 10. the Lichtenstein tension free repair technique

In the above case using the Lichtenstein tension free repair technique (Using polypropilen mesh, Mesh 8 x 16 cm is adjusted to the patient's needs. Mesh preparation: The corners can be cut so that they give a rounded shape. A slit is given at the lateral border of the net at the junction of the lower third and the upper two-thirds, to allow the spermatic cord to pass through. The two tails (slit ends) overlap each other. Suturing: Medially, the mesh overlaps with the pubic tuberculum and is sewn over the symphytic tissue (avoid pubic bones to prevent pubic osteitis). Laterally, both tails are placed outside the annulus internus and sewn up. At the bottom, it is sutured to the inguinal ligament and at the top to the conjoint tendon (Olosegun *et al.*, 2023; Hotewar *et al.*, 2024).

CONCLUSION

This article presents a case of a 48-year-old man with a reducible right scrotal hernia, a condition characterized by the extension of an inguinal hernia into the scrotum, which is notably more common in developing countries (67%) than in developed ones (6%). The patient experienced a gradually enlarging scrotal lump over 10 years, which increased with physical strain and reduced when lying down, with clinical examination confirming a repositionable 7×5×3 cm mass. Differential diagnoses included hydrocele and testicular tumors. Surgical treatment entailed herniotomy, herniorrhaphy, and hernioplasty using the Lichtenstein Tension-Free Repair technique, followed by careful postoperative care. The case underscores the importance of early diagnosis and timely surgical management to prevent complications such as incarceration or strangulation. Future research should focus on evaluating long-term outcomes and comparing surgical techniques for scrotal hernias in resource-limited settings to optimize patient care and guidelines.

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