

POSTOPERATIVE INGUINODYNIA IN LAPAROSCOPIC INGUINAL HERNIA REPAIR: A COMPARATIVE STUDY OF TAPP VERSUS TEP

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ABSTRACT BACKGROUND

Inguinodynia, or chronic groin pain, following inguinal hernia repair is a significant yet often under-reported postoperative complication. While mild pain for a few days after mesh repair is common, moderate to severe pain persisting beyond three months is considered pathological. The causes are multifactorial, including neuropathic pain from injury or entrapment of inguinal nerves and non-neuropathic pain from mesh fixation, fibrosis, or foreign body reaction. Patients may experience a dull ache or sharp, shooting pain radiating along the ilioinguinal, iliohypogastric, or genital branch of the genitofemoral nerve.

Lightweight meshes are preferred as they provoke less foreign body reaction and improve patient comfort. Identification and preservation of inguinal nerves during surgery have been shown to reduce postoperative pain, though the evidence comparing nerve preservation and neurectomy remains inconclusive. Both medical and surgical treatments are available but carry risks such as analgesic side effects, sensory loss, or hernia recurrence. Therefore, prevention through meticulous surgical technique, gentle tissue handling, and effective perioperative counselling remains the best strategy to minimize chronic postoperative pain and enhance long-term outcomes.

Aim And Objective

To compare the incidence of inguinodynia following TAPP and TEP laparoscopic repair.

Materials And Methods

This prospective observational study included 100 patients undergoing elective laparoscopic hernioplasty (50 TEP and 50 TAPP) at Saveetha Medical College, Chennai, between June 2022 and June 2024. Postoperative pain was assessed using a 4- point verbal scale (0–3) at 1 week, 1 month, and 6 months after surgery.

Results

The overall incidence of inguinodynia was 16%, with higher rates in TAPP (20%) than in TEP (12%). Increased pain in the TAPP group may be attributed to peritoneal flap dissection causing greater nerve irritation. Mild pain was about eight times more common than severe pain. Pain improved in most patients by 3 months (38%) and further by 6 months (16%). The majority (70%) of cases occurred in the 40–60-year age group.

Conclusion

Laparoscopic inguinal hernia repair using both TAPP and TEP techniques is safe and effective. However, the present study demonstrates that the incidence of chronic groin pain (inguinodynia) is lower following the TEP approach compared to TAPP repair. The higher rate of pain in TAPP may be related to peritoneal dissection and increased risk of nerve irritation. Most cases of inguinodynia were mild and showed progressive improvement within six months. Meticulous intraoperative nerve identification, minimal tissue handling, and the use of lightweight mesh are key factors in reducing chronic postoperative pain. Continued emphasis on surgical precision and patient follow-up can help achieve optimal long-term outcomes and improve quality of life after hernia repair

INTRODUCTION

Hernia repair is one of the most common operations performed by general surgeons. Despite its frequency, ideal results are often difficult to achieve, and complications such as postoperative pain, nerve injury, infection, and recurrence continue to challenge surgeons.

Definition:

The term hernia is derived from the Latin word for “rupture.” It is defined as the abnormal protrusion of an organ or tissue through a defect in its surrounding wall. Although hernias can occur at various sites of the body, they most frequently involve the anterior abdominal wall, particularly the inguinal region.

Nerves of the Inguinal Region:

The iliohypogastric and ilioinguinal nerves usually arise from the anterior rami of the T12 and L1 spinal nerves. The iliohypogastric nerve pierces the transversus abdominis near the iliac crest, travels between the transversus and internal

oblique muscles, and emerges through the external inguinal ring to supply the lower abdominal wall. The ilioinguinal nerve runs parallel and inferior to the iliohypogastric nerve, accompanying the spermatic cord through the inguinal canal to provide sensory innervation to the skin of the groin, scrotum, or labia. The genital branch of the genitofemoral nerve, which accompanies the cremaster vessels, innervates the cremaster muscle and the skin on the lateral side of the scrotum or labia.

These three nerves — iliohypogastric, ilioinguinal, and the genital branch of the genitofemoral nerve — are of particular importance during inguinal hernia repair, as they lie close to the operative field and are vulnerable to injury. They provide sensation to the groin, upper medial thigh, and external genitalia. Damage or entrapment of these nerves during dissection or fixation may lead to postoperative neuralgia and chronic groin pain.

Laparoscopic Hernia Repair:

Laparoscopic inguinal hernia repair has become a well-established alternative to open repair. Initially indicated for bilateral and recurrent hernias, it is now widely used for primary and unilateral hernias as well. The main advantages include faster postoperative recovery, reduced wound complications, and potentially lower rates of chronic groin pain.

There are two primary laparoscopic approaches — the Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP) techniques. Both methods involve placing a large mesh to cover the myopectineal orifice, thereby addressing direct, indirect, and femoral defects. The difference lies in the surgical plane: in the TAPP approach, the peritoneum is incised to access the preperitoneal space and is closed after mesh placement, whereas in the TEP approach, the preperitoneal space is entered without breaching the peritoneum.

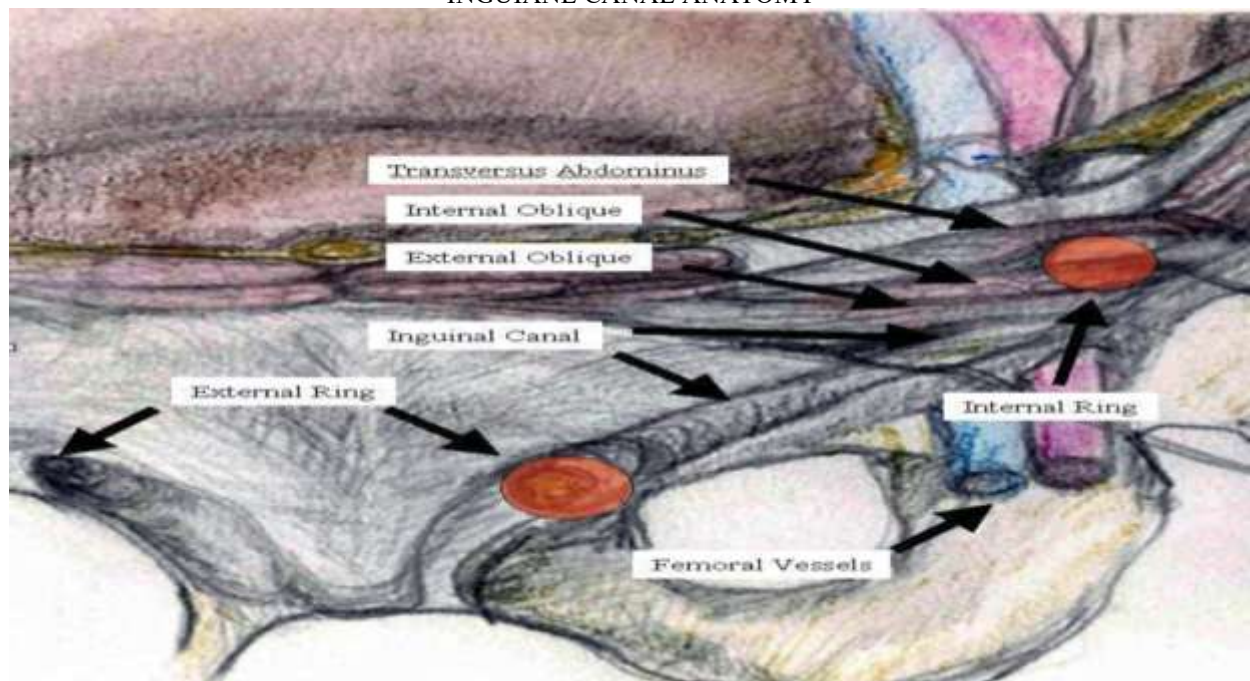
In TEP repair, ports are aligned from the pubic bone to the umbilicus, while in TAPP repair, ports are positioned at the umbilicus and bilaterally along the midclavicular line. Closure of the peritoneal flap in TAPP, usually with sutures or tacks, ensures that the mesh remains preperitoneal and separate from the abdominal viscera. Both approaches, when performed meticulously, offer durable repairs with low recurrence rates and excellent functional outcomes.

INGUINODYNIA (CHRONIC POST OP PAIN):

Post herniorrhaphy pain syndrome or inguinodynia is defined as pain or discomfort lasting greater than 3 months after inguinal hernia surgery. Patients may present with neuralgia, parasthesia, hypoaesthesia, hyperaesthesia.

Postoperative pain is the significant problem after open inguinal hernia repair. Chronic groin pain is one of the most debilitating long-term complications after inguinal hernia repair, which can significantly affect the patient's satisfaction and quality of life after the operation. A proposed mechanism for the development of post-operative pain chronic groin pain is the inflammation and fibrosis induced by the mesh, which is in close proximity to the ilioinguinal nerve. In addition, unintentional injury or strangulation of the ilioinguinal nerve during suturing may also contribute to the phenomenon.

INGUINAL CANAL ANATOMY



AIM AND OBJECTIVE

This study aims to compare the incidence and severity of inguinodynia following laparoscopic inguinal hernia repair using TAPP and TEP techniques and to determine which approach is associated with fewer post operative complications.

MATERIALS AND METHODS

The study was initiated after obtaining approval from the institutional ethics committee of Saveetha Medical College and Hospital. All the patients who underwent elective open or laparoscopic hernioplasty in saveetha medical college between June 2022 to June 2024.

Patients enrolled in the study were assessed preoperatively and vital information was gathered regarding personal and medical history regarding type duration of hernia and it's reducibility.preoperative symptoms and comorbid conditions already diagnosed with patient.The patients underwent either TAPP or TEP laproscopic repair.
Decision for type of hernia repair was based on type of hernia, fitness of patient, and surgeon preferences.
By considering the inclusion ,exclusion and loss of follow up,we have examined a total of 100 patients,with 50 patients in each group

INCLUSION CRITERIA:

1. All male patients between the age of 18 and 70 years
2. All patients with unilateral inguinal hernias either direct inguinal hernia or indirect inguinal hernias.
3. All patients who are fit to undergo elective surgery with good performance status.
4. All patients with uncomplicated unilateral hernias.
5. All patients were planned for elective hernia repair.

After explaining the procedure and proposed outcomes to the patients were divided into two groups group A- undergoing TAPP repair and the second group B-undergoing TEP hernia repair.

EXCLUSION CRITERIA:

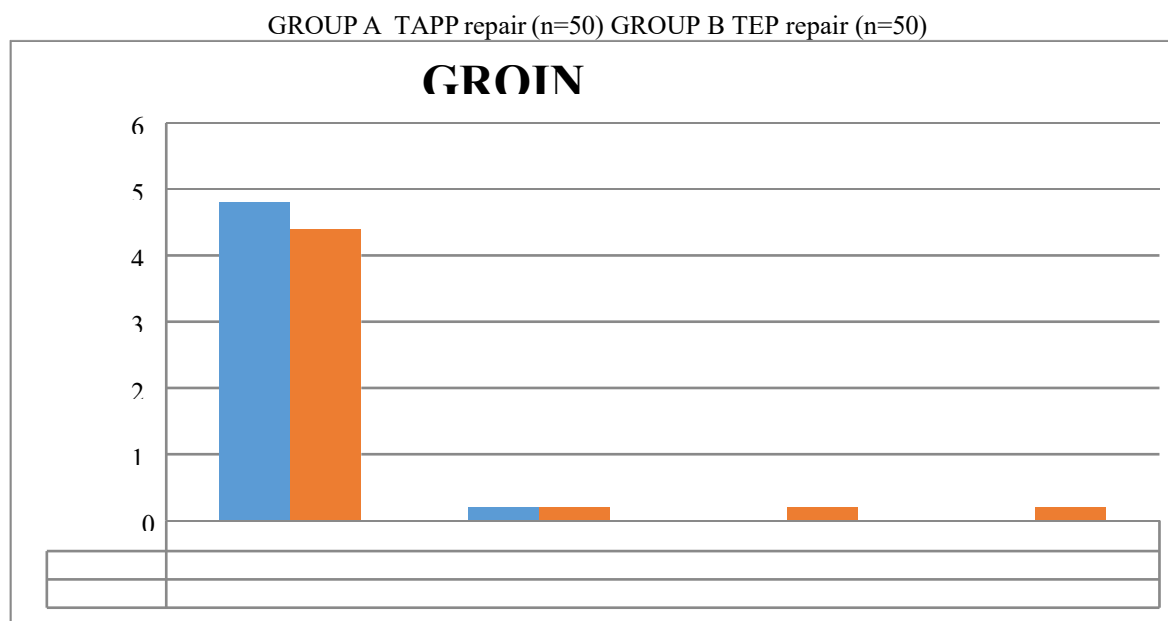
1. Male patients with bilateral inguinal hernias
2. All patients below the age of 18 years
3. Female patients with inguinal hernias.
4. All male patients with recurrent, complicated inguinal hernias like obstructed or strangulated inguinal hernias requiring emergency management.
5. Those with h/o peripheral neuropathy.
6. Those with impaired cognitive function.

Statistical analysis:

The statistical analysis will be carried out with IBM SPSS version-20(Chicago,IL,USA). Categorical data is presented as actual numbers and percentages. Categorical variables were analysed using the chi square test . Continuous variables were presented as mean +/- SD .For normally distributed data analyses will be done by unpaired t test and for abnormally distributed data analysis was done by using non-parametric Mann Whitney U test.

RESULTS

A total of 100 patients were eligible for the study during the 18 month with 50 patients in each group. The two groups were comparable with regard to laterality of hernia, baseline pain measurement during various activities, incidence of groin numbness, and complications.



	2.NONE	3.MILD	4.MODERATE	5.SEVER
GROUP A	48	2	0	0
GROUP B	44	2	2	2

Comparison of Postoperative Pain and Numbness (TEP vs TAPP) Group A – TEP; Group B – TAPP

Time Point	Parameter	Group A (No./%)	Group B (No./%)	SD	P value
After 1 week	Pain at rest	5	4	0.5	1.0
	Pain after coughing	19	16	1.5	1.0
	Pain after walking	11	14	1.5	1.0
	Growing numbness	2	6	2.0	1.0
After 3 months	Pain at normal activity	14	19	2.5	1.0
	Pain at rest	10	14	2.0	1.0
	Pain after coughing	14	16	1.0	1.0
	Pain after walking	10	10	1.0	1.0
	Growing numbness	5	20	7.5	1.0
After 6 months	Pain during normal activity	0	2	1.0	1.0
	Pain at rest	0	6	3.0	1.0
	Pain after coughing	3	8	2.5	1.0
	Pain after walking	3	8	2.5	1.0
	Growing numbness	5	10	2.5	1.0

DISCUSSION

The study was conducted at Saveetha Medical College and Hospital. A total of 100 patients were chosen based on prefixed criteria. Postoperative chronic pain is a significant problem after TAPP hernia repair.

From this study, we conclude that the overall incidence of inguinodynia was 16% with a higher incidence following TAPP (20%) compared to TEP (12%). The incidence of mild inguinodynia is approximately eight times more common than severe inguinodynia. A high percentage of patients showed a tendency towards improvement of inguinodynia over 3 months (38%) to 6 months (16%) follow-up. Most (70%) of the study patients fell in the age group of 40 to 60 years and required on- and-off analgesia for pain relief.

Damage to the ilioinguinal nerve passing through the surgical field is suspected to be one of the main causes of chronic post-herniorrhaphy pain. This theory is supported by the association between chronic pain and sensory disturbances. A nerve may be damaged during operation as a result of perineural fibrosis, entrapment by staples, sutures, or prosthetic materials, or direct injury due to stretching, contusion, electrical injury, or partial to complete division of the nerve.

Elective division of the ilioinguinal nerve has been proposed by some hernia surgeons to reduce the risk of inadvertent

damage and consequent chronic pain. It is possible that differences in the incidence of chronic pain between the groups, as well as the quality-of- life measurements, will change with longer follow-up duration.

CONCLUSION

Laparoscopic inguinal hernia repair, whether performed by the TAPP or TEP technique, is a safe and effective procedure with low complication rates. The present study demonstrates a lower incidence of postoperative chronic groin pain (inguinodynia) following TEP approach (12%) compared to the TAPP approach (20%). The higher incidence of pain in the TAPP group may be attributed to peritoneal flap dissection and nerve irritation. Most cases were mild and improved over six months.

Meticulous surgical technique , gentle tissue handling and proper selection are key to minimize chronic pain and improving long term outcomes.

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