



COMPARATIVE STUDY ON OPEN V/S LAPAROSCOPIC MESH HERNIOPLASTY

General Surgery

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ABSTRACT

Introduction: Inguinal hernia is a prevalent surgical condition requiring timely intervention. It affects a significant portion of the population, particularly males, due to inherent anatomical weaknesses. Traditional open mesh hernioplasty has long been the gold standard due to its simplicity, ease of learning, and reliable outcomes. However, advancements in minimally invasive surgery have led to the increasing popularity of laparoscopic mesh hernioplasty, which offers potential benefits such as reduced post-operative pain, faster recovery, and improved cosmetic outcomes. Despite these advantages, laparoscopic hernioplasty comes with challenges, including a steep learning curve, higher costs, and longer operative times. This study aims to provide a comparative analysis of these two techniques, focusing on post-operative pain, cosmetic outcomes, infection rates, and time to resumption of daily activities. **Materials And Methods:** A prospective observational cohort study was conducted at Dhiraj Hospital on 50 patients diagnosed with uncomplicated inguinal hernia. They were randomly assigned to either laparoscopic or open mesh hernioplasty, and post-operative outcomes were assessed. Pain was measured using the Visual Analogue Scale (VAS), and cosmetic outcomes were evaluated using the SCAR scoring system. Infection rates, complications, and time to resume daily activities were recorded. Data analysis was performed using statistical software. **Results:** The study demonstrated a significant reduction in post-operative pain in patients undergoing laparoscopic hernioplasty compared to open surgery. On post-operative day 0, the mean VAS score for laparoscopic patients was 3.75, whereas it was 4.95 for open surgery patients. By post-operative day 2, the difference remained, with laparoscopic patients averaging 1.8 and open surgery patients 2.67. Additionally, SCAR scoring indicated better cosmetic outcomes in laparoscopic procedures, as 55% of patients had lower SCAR scores compared to 30% in the open group. Notably, infection rates were considerably lower in laparoscopic patients (0%) versus those undergoing open surgery (16.67%). Regarding recovery, the average time for patients to resume daily activities was comparable, with laparoscopic patients taking an average of 6.75 days and open surgery patients taking 6.9 days. However, despite the similar recovery period, laparoscopic patients reported less discomfort and were able to return to work or normal routines with greater ease. The absence of major complications in laparoscopic procedures reinforced its safety profile, while open hernioplasty had a few cases of post-operative wound infections, emphasizing the importance of meticulous wound care in open surgery. **Conclusion:** This comparative study underscores the advantages of laparoscopic mesh hernioplasty in reducing post-operative pain, improving cosmetic outcomes, and minimizing infection rates. Despite similar recovery times, the lower discomfort levels in laparoscopic patients suggest a potential benefit in quality of life post-surgery. Open hernioplasty remains a reliable technique, particularly for surgeons with less experience in laparoscopy, but the increased infection risk and post-operative discomfort highlight areas for improvement. As surgical techniques continue to evolve, laparoscopic hernioplasty may become the preferred approach for patients prioritizing minimal pain and better cosmesis. Future research with larger sample sizes and longer follow-up periods is recommended to assess long-term recurrence rates and further validate these findings.

KEYWORDS

Inguinal hernia, Laparoscopic hernioplasty, Open hernioplasty, Post-operative pain, Cosmesis, Infection rates, Recovery time, Minimally invasive surgery.

INTRODUCTION:

"No disease of human body. Belonging to the province of surgeons requires in its treatment, a better combination of accurate, and chemical knowledge with surgical skill, then hernia in all its varieties."

-Sir Astley Paston Cooper, 1804[1]

Inguinal hernia is a very common disease. It is estimated that at least five percent of the population, will develop an inguinal hernia in their lifetime. Making inguinal hernia repair one of the most common operations performed by General surgeons[2]. The only way to treat inguinal hernias is surgery. Around five lakh hernia repairs are performed annually [3].

Protrusion of any tissue through a feeble fragile, weak spot in the muscle of the anterior abdominal wall is known as inguinal hernia. The lifetime incidence of inguinal hernia, amongst men is found to be 27 percent, and in women is found to be 3 percent.[4]

The objective of hernia repair is to provide the strongest repair and lower to nil, recurrence rate, with minimal discomfort post-operatively and quick recovery. For this, we have invented Old traditional open Hernioplasty techniques to new and advanced laparoscopic techniques. The rapid changes that have been witnessed in open surgeries, prosthetic materials and laparoscopic surgery have made hernia surgery the most interesting field of endeavor that demands renewed discipline and dedication. Though a variety of procedures have been performed, none can be termed as the ideal procedure as each procedure is associated with varied early or late complications with the most significant being recurrence. Other complications include hematoma formation, wound infection, chronic inguinal pain, hydrocele, testicular pain, testicular swelling, and hyperesia.[5]

When mesh was not discovered, bassini's repair and shouldice repair

was done where the tissue was under tension and following surgery it lead to several complications such as severe post operative pain, wound infection and recurrence.

The introduction of prosthetic material by Usher in 1958 was revolutionary for inguinal hernia repair surgery.[6]

In 1984, Stopa introduced open preperitoneal mesh repair using Dacron(mersilene) mesh to make a replacement for fascia transversalis but altho recurrence rates decreased there was significant postoperative pain and morbidity[7].

In 1989 Lichtenstein introduced tension free open mesh hernioplasty, which due to no Suture line tension improved post operative pain profile [8].

In 1982 ger performed first laparoscopic hernia repair by using kocher's clamp to hold the internal ring and the hernial sac's peritoneal opening was closed with stainless steel clips [9].

There Are Two Approaches For Laparoscopic Hernia Repair:

- 1) Total Extra Peritoneal Repair(TEP)
- 2) Trans Abdominal Pre-Peritoneal Repair(TAPP)

Total Extra Peritoneal Repair- Done by creating a space between peritoneum and abdominal muscles without entering the peritoneal cavity. This was first described by Ferzli [1992] and McKernan [1993] [10,11]

Trans Abdominal Pre-peritoneal Repair - Here peritoneum is breached above hernia defect and around the defect peritoneum is reflected entering the space between peritoneum and abdominal muscle. It was first introduced by Arregui and Dion.[12]

In our institute, inguinal hernia repair is one of the most common surgeries performed both laparoscopically and open. This study aims at studying the comparative pain, cosmesis, post operative infection and time for resumption of daily activities in both laparoscopic and open mesh hernioplasty.

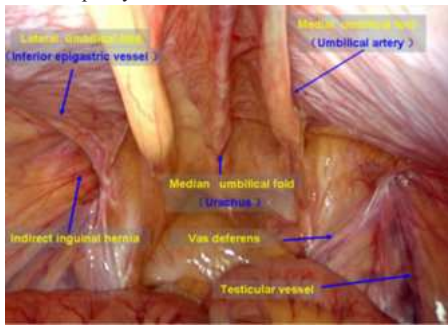


Figure 1: Laparoscopic view of inguinal region with indirect inguinal hernia (before peritoneal reflection)

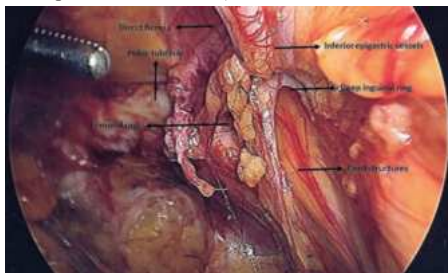


Figure 2: After Peritoneal Reflection

Aim:

- To compare post operative outcome of laparoscopic and open mesh hernioplasty

Objectives;

- To compare pain in lap. Vs open mesh hernioplasty
- To compare cosmesis in lap. vs open mesh hernioplasty
- To compare post op infection in lap. Vs open mesh hernioplasty
- To compare resumption of daily activities in lap. Vs open mesh hernioplasty

MATERIALS AND METHODS:

Study Site:- Dhiraj Hospital

Study Design:- Prospective Observational Cohort Study

Sample Size:- 50

Study Period:- From date of approval of the study to Completion of all the cases

Inclusion Criteria:-

- Patients of either gender that aged more than or equal to 18 years.
- All patients of uncomplicated inguinal small or medium sized, direct or indirect, unilateral or bilateral hernias undergoing elective inguinal hernia surgery
- Patients who developed post-operative surgical site infections.
- Patient that gave written informed consent.
- Patients with Unilateral Inguinal Hernia

Exclusion Criteria :-

- Patients with complicated hernia (irreducible, obstructed, strangulated), those with large size sac, recurrent hernia
- Patients who are unfit for general anesthesia, laparoscopy or pneumoperitoneum i.e. those with cardiac diseases (MI, IHD), respiratory diseases (chronic asthma, COPD), renal or hepatic diseases, bleeding disorders.
- Patients who took DAMA, or did not follow up within 30 days of operation.
- Patient who did not want to participate in the study.
- Patients with Bilateral Inguinal hernia

Method Of Study:-

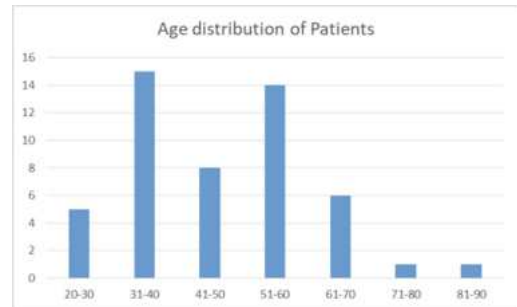
This is a prospective observational cohort study conducted at Dhiraj general Hospital on patients presenting with uncomplicated inguinal hernia. After obtaining consent patients will be enrolled in our study.

On admission, detailed history will be taken and all patients will be subjected to thorough clinical examination including per abdominal examination including genital area and all the hernia sites and per rectal examination. Routine lab investigations like blood haemogram, Renal function test, Liver function test, Random blood sugar, Serology. Clotting profile, Electrocardiogram and Chest x-ray will be done.

Those patients having irreducible/obstruction/strangulation will be excluded from this Study. Once the patient is deemed fit for surgery either laparoscopic or open inguinal hernioplasty is planned and consent is taken for the same.

RESULTS:

Table 1 : Age Distribution Of Patients Studied



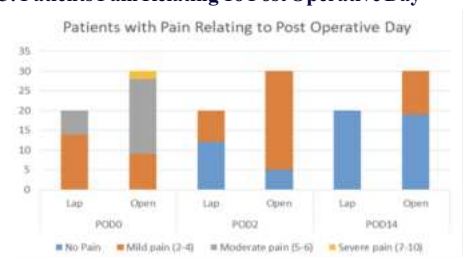
Age	20-30	31-40	41-50	51-60	61-70	71-80	81-90
Number of Patients	5	15	8	14	6	1	1

Table 2: Diagnosis Based On Location Of Defect Of Patients Studied

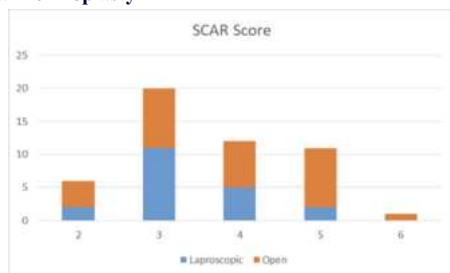


Diagnosis based on Location		
Diagnosis	Number of patients	Percentage
Left Inguinal Hernia	21	42
Right Inguinal Hernia	29	58

Table 3: Patients Pain Relating To Post Operative Day



Number of patients with pain						
Vas score	POD0		POD2		POD14	
	Lap	Open	Lap	Open	Lap	Open
No Pain	0	0	12 (60%)	5 (16.67%)	19 (95%)	19 (63.3%)
Mild pain (2-4)	14 (70%)	9 (30%)	8 (40%)	25 (83.3%)	1 (5%)	11 (36.67%)
Moderate pain (5-6)	6 (30%)	19 (63.3%)	0	0	0	0
Severe pain (7-10)	0	2 (6.6%)	0	0	0	0

Table 4: Comparison Of SCAR Scores In Laparoscopic Vs Open Inguinal Hernioplasty

Scar score	Laparoscopic		Open	
2	2	10%	4	13.33%
3	11	55%	9	30%
4	5	25%	7	23.33%
5	2	10%	9	30%
6	0	0%	1	3.33%

Table 5 : Comparison Between Post Op Infection Rates Of Open Vs Laparoscopic Inguinal Hernioplasty

Post op Scar site infection	Laparoscopic		Open	
Yes	0		5	16.67%
No	20	100%	25	83.33%

Table 6: Comparison Between Days To Resumption Of Activities Between Laparoscopic And Open Inguinal Hernioplasty

Days to resumption of daily activities	Laparoscopic		Open	
4	0	0%	2	6.67%
5	7	35%	6	20%
6	2	10%	4	13.33%
7	4	20%	7	23.33%
8	3	15%	3	10%
9	4	20%	8	26.67%

CONCLUSION :

The comparative study on open versus laparoscopic mesh hernioplasty provided significant insights into the effectiveness, patient outcomes, and potential complications associated with these two widely practiced surgical techniques. This research addressed key aspects, including post-operative pain, cosmesis, infection rates, and recovery times, and highlighted the broader implications for surgical practice and patient care.

The findings underscore the evolution of hernia surgery over time. Traditional open mesh hernioplasty has long been considered the standard for inguinal hernia repair due to its straightforward technique, wide applicability, and relatively low cost. However, the laparoscopic approach, with its minimally invasive nature, has emerged as a strong competitor, offering several advantages, particularly in terms of post-

operative pain management and cosmesis. As the results demonstrate, laparoscopic hernioplasty consistently resulted in lower pain scores across all post-operative timelines compared to open surgery. This aligns with global findings that attribute the reduced pain to the precision of laparoscopic techniques, which minimize tissue handling and tension during the procedure.

Cosmesis also emerged as a critical differentiator between the two approaches. The study's use of SCAR scoring highlighted the superior aesthetic outcomes associated with laparoscopic surgery. Patients undergoing laparoscopic procedures had smaller and less conspicuous scars, contributing to higher satisfaction rates. This advantage is especially significant in an era where patient-centered care emphasizes not just clinical success but also quality-of-life improvements.

Infection rates further highlighted the benefits of laparoscopic techniques. While open hernioplasty presented a 16.67% rate of post-operative infection, laparoscopic surgeries showed a remarkable 0% infection rate. These findings underscore the importance of reduced wound exposure and meticulous operative techniques in minimizing complications. Additionally, the study's observations regarding post-operative dressing protocols provide actionable insights for improving clinical outcomes. The use of advanced occlusive dressings in laparoscopic cases likely contributed to the lower infection rates, suggesting a potential area for optimization in open surgery protocols.

Recovery time, as measured by the days to resumption of daily activities, presented a nuanced picture. Although the laparoscopic group showed slightly faster recovery in terms of mean days, the difference was not statistically significant in this study. This contrasts with some international findings, which report more pronounced advantages for laparoscopic surgery. However, the results still reflect a broader trend favoring laparoscopic techniques for earlier mobilization, a critical factor in reducing complications like deep vein thrombosis and enhancing overall patient recovery.

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