ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 08 | August - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OPEN VERSUS LAPAROSCOPIC HERNIA – A TELLTALE FIGHT FOR SURGICAL SUPREMACY….WHO WINS??

General Surgery

Dr. Anil Raj D* Assistant Professor, Department of General Surgery, P K Das Institute of Medical Sciences, Vaniamkulum, Palakkad, Kerala-679522, INDIA. *Corresponding Author

Dr. Veeresh M Annigeri Assistant Professor, Department of General Surgery, P K Das Institute of Medical Sciences, Vaniamkulum, Palakkad, Kerala-679522, INDIA.

ABSTRACT

INTRODUCTION: Inguinal hernia repair has been one of the most common operations performed by general surgeons for years. The most significant advances to impact inguinal hernia repair have been the addition of prosthetic materials to conventional repair and the introduction of laparoscopy to general surgical procedures. Over the years, surgeons all over the world have tried various techniques for repair of inguinal hernias. Each procedure had its own advantages and disadvantages. This clinical study was undertaken to study the comparison of open and laparoscopic inguinal hernias repair and their postoperative complications.

OBJECTIVES: To compare the Open & Laparoscopic method of Mesh Repair of Inguinal Hernia

MATERIALS: Study was conducted in rural medical college in Kerala over a period of 2 years. 100 cases of diagnosed inguinal hernias were selected & randomly allotted, 75 cases to Open Lichtenstein Tension-Free Hernia Repair group & 25 cases to Laparoscopic TEP group, information was collected. Collected data analyzed by SPSS software with Pearson Chi-square test & independent sample t- test.

RESULTS: In our study mean operating time in Open group is 48.53mins & in TEP group is 76.80mins.The incidence of per & post-operative complications was significantly different in the two groups. TEP group had lesser duration of Post-Operative Pain, lesser duration of hospital stay, lesser Time to return to normal activities.

CONCLUSION: Though TEP repair is more time consuming than Open Lichtenstein Repair, it is associated with statistically significant different complications profile, lesser post-operative time, lesser duration post-operative hospital stay, & earlier return to normal activities. Hence the overall benefit is better in the TEP repair than the open repair for inguinal hernias.

KEYWORDS

Inguinal hernia, Mesh Repair, Minimally Invasive, TEP repair, Laparoscopic Surgery, Lichtenstein Repair

INTRODUCTION:

Hernia is derived from the Latin word for rupture. A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. Inguinal hernia repair is the most commonly performed operation by General Surgeons owing to a significant lifetime incidence and variety of successful treatment modalities.

A normal abdominal wall has sufficient strength to resist high abdominal pressure and prevent herniation of content. Herniation has been attributed to high pressures from constipation, prostatic symptoms, excessive coughing in respiratory disease and obesity. There is good evidence that hernia is a 'collagen disease' and due to an inherited imbalance in the types of collagen.

Inguinal hernias are classified as direct or indirect. Inguinal hernias may be congenital or acquired. This distinction is of little importance because the operative repair of these types of hernias is similar.

A hernia is reducible when its contents can be replaced within the surrounding musculature, and it is irreducible or incarcerated when it cannot be reduced. A small defect with rigid walls traps the content and prevents it from freely moving in and out of the defect, increasing the risk of complications. A strangulated hernia has compromised blood supply to its contents, which is a serious and potentially fatal complication occurs in only 1% to 3% of groin hernias.

Elective surgery for inguinal hernia is a common and simple operation. It can be undertaken under local, regional or general anaesthesia with minimal risk even in high-risk patients. Surgical repair is the definitive treatment of inguinal hernias; however, operation is not necessary in a subset of patients. When the patient's medical condition confers an unacceptable level of operative risk, elective surgery should be deferred until the condition resolves, and operations reserved for life threatening emergencies.

Immediate complications include bleeding and urinary retention which may require catheterisation. Over the next week, seroma formation and wound infection may occur. After laparoscopic surgery, a seroma may be misdiagnosed as an early recurrence. In the longer term, hernia recurrence and chronic pain are the main concerns. Rarely damage to the testicular artery can lead to testicular infarction.

Open/ anterior method of inguinal hernia repairs are subdivided into techniques that employ prostheses to create a tension-free repair and those that reconstruct the inguinal floor using native tissue. Tissue repairs are indicated when the use of prosthetic material is contraindicated (contamination or strangulation).Open tissue repairs include Bassini repair, Shouldice repair, and McVay Cooper's ligament repair.

The most significant advance to impact inguinal hernia repair is the addition of prosthetic materials to conventional repair include Lichtenstein tension-free hernioplasty, Plug and patch repair, Prolene Hernia System, Stoppa repair.

Laparoscopic tension-free mesh repair of inguinal hernia based on a preperitoneal approach has added to the armamentarium of the general surgeon. The laparoscopic approach provides the mechanical advantage of placing a large piece of mesh behind the defect covering the myopectineal orifice and using the natural forces of the abdominal wall to anchor the mesh in place.

The most popular techniques include a totally extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) approach. The main difference between these two techniques is the sequence of gaining access to the preperitoneal space. In the TEP approach, the dissection begins in the preperitoneal space using a balloon dissector. With the TAPP repair, the preperitoneal space is accessed after initially entering the peritoneal cavity.

If neither the patient nor surgeon can reduce the hernia then treatment is more urgent. An irreducible hernia may influence the decision between open and laparoscopic surgery. Over the years, surgeons all over the world have tried various techniques for repair of inguinal hernias. Each procedure had its own advantages and disadvantages.

This clinical study has been undertaken to study the comparison of open and laparoscopic approaches for mesh repair of inguinal hernias.

AIMS AND OBJECTIVES:

To compare the Open & Laparoscopic method of Mesh Repair of Inguinal Hernia with respect of the following outcomes:

- Duration of the Procedure
- Postoperative Discomfort or Pain.
- Complications Per operative & Postoperative.
- Duration of Hospitalization.
- Time to return to normal activities.

MATERIALS AND METHODS:

Primary source of information method will be used on the patients admitted in the Department of General surgery, PK Das Institute of Medical Sciences, Vaniamkulam, Palakkad, Kerala with clinically diagnosed inguinal hernias, requiring surgical intervention and is able to afford the cost of prosthesis. The study will be conducted over period of two years.

Primary source data will be collected from a specially designed case recording Performa (CRF) pertaining to the selected patients. Prior to selection, they will undergo routine history taking, physical examination and investigations. Informed written consent and Ethical committee approval will be taken prior to the study.

Sample Size

Proportion of Hernia cases is about 5%. With allowable error & level of significance 5%, using Estimation method sample size is 104. However, 75% of Hernia are Inguinal Hernias. As a result the required inflated sample size for the study was 100 & collected on convenient basis.

Inclusion Criteria for the Study

- Patients who present with Inguinal Hernias.
- Patients with Uncomplicated Inguinal Hernias.
- Medically fit patients for surgery.

Exclusion Criteria for the Study

- Patients presenting with other types Hernias
- Paediatric cases of Hernia
- Patients with complicated Inguinal Hernias (Irreducible,bstructed, Strangulated hernia)
- Patients unfit for Surgery
- Candidates who were reluctant to oblige for the study.

The following details regarding the patient were collected

- Age of the patient.
- Symptoms and their duration,
- Past history
- Complete physical examination,
- Treatment given
- Duration of the Procedure
- Complications Per operative & Postoperative
- Postoperative Discomfort or Pain
- Duration of Hospitalization
- Time to return to normal activities

In the open inguinal hernioplasty group Lichtenstein s tension free hernioplasty was done and in the laparoscopic group TEP was done. Duration of procedure was taken from the skin incision to skin closure.

Lichtenstein's tension free hernioplasty steps

- Anaesthesia given
- Patient put on supine position
- Parts were painted and draped
- Groin incision
- Opening of inguinal canal
- If indirect sac
- Freeing of hernia sac from the spermatic cord contents
- Reducing the contents in the hernial sac
- Excision of excess sac
- Transfixing the neck of sac of hernia with vicryl 2-0-
- Placing/fixing the mesh
- The Prolene mesh placed and fixed with 2-0 prolene
- Confirm haemostasis
- Wound closure done in layers

Steps of Totally Extraperitoneal Repair

- A 10-mm infraumbilical incision is made to enter either the ipsilateral rectus sheath
- Subcutaneous tissue is dissected to the level of the anterior rectus sheath, which is then incised lateral to the linea alba.
- The posterior sheath is visualized after retraction of the rectus muscle, and blunt dissection is done between the rectus muscle and the posterior rectus sheath, using first a finger followed by a blunt object such as a laparoscope, aiming toward the symphysis pubis.
- Under direct visualization with a 30° laparoscope, slowly to bluntly dissect the preperitoneal space, pneumopreperitoneum is achieved by insufflation to 15mmHg.
- A 5-mm trocar is placed suprapubically in the midline, and another is placed inferior to the insufflation port.
- Dissection was done from pubic symphysis to Anterior superior Iliac Spine
- Any peritoneal rents should be repaired prior to desufflation to prevent mesh from contacting intraperitoneal structures
- Mesh placement
- Following mesh placement, the preperitoneal space is desufflated slowly under direct vision to ensure proper mesh positioning.
- Trocars are removed, and the anterior rectus sheath is closed with an interrupted suture.

STATISTICAL ANALYSIS:

The collected data was analyzed by using Pearson chi-square tests & independent sample t test by p value. A value of less than 0.05 was considered as statistically significant. SPSS Statistical software was be utilized for this purpose.

OBSERVATIONS & RESULTS:

In our study 72 were male patients & 3 females in open group & in TEP repair group all were males. 42 patients in open group & 14 in TEP group had Right sided, 26 in open group & 09 in TEP group had Left sided, 7 in open group & 02 in TEP repair group had Bilateral inguinal hernia. 31 patients in open group & 13 in TEP group had Direct, 44 in open group & 12 in TEP group had Indirect Inguinal hernia.

Complications

Complications	Open		TEP		Total	
	Count	%	Count	%	Count	%
Nil	46	61.3%	17	68.0%	63	63.0%
Seroma	8	10.7%	0	.0%	8	8.0%
Seroma, Hematoma	2	2.7%	0	.0%	2	2.0%
Hematoma	5	6.7%	0	.0%	5	5.0%
Surgical Site Infection	5	6.7%	1	4.0%	6	6.0%
Surgical Emphysema, Mesh Displacement	0	0.0%	1	4.0%	1	1.0%
Irreducibility Conversion to Open	0	0.0%	2	8.0	2	2.0%
Urinary Retention	9	12.0%	4	16.0%	13	13.0%

The incidence of post-operative complications was significantly different in the two groups with Pearson Chi-Square value14.585 & p value 0.042.

Minimum Duration of Surgery in Open group is 30mins & in TEP is 60mins, Maximum duration in both Open & TEP is around 95mins, Mean operating time in Open group is 48.53mins with a Std deviation of 13.65 & in TEP group is 76.80mins with a Std deviation of 11.63.

Duration of Post-Operative Pain

No Of Days		Group		Total
		Open	TEP	
1-2	Count	21	14	35
	%	28.0%	56.0%	35%
3-4	Count	35	9	44
	%	46.7%	36.0%	44%
5-6	Count	19	2	21
	%	25.3%	8.0%	21%
Total	Count	75	25	100
	%	100.0%	100.0%	100.0%

In comparison to the Open group the TEP group had lesser duration of Post-Operative Pain which has statistically significant Pearson Chi-Square value 7.367 & p value < 0.025.

Duration of Post-Operative Hospital Stay in days

Group	Number	Minimum	Maximum	Mean	Std. Deviation	Std. Error Mean
Open	75	3	10	5.31	1.924	0.222
TEP	25	2	8	3.68	1.547	0.309

In comparison to the Open group the TEP group had lesser duration of hospital stay which has statistically significant t value 3.830 & p value <0.001.

Time to return to normal activities in weeks

Group	Number	Minimum	Maximum	Mean	Std. Deviation	Std. Error Mean

Open	75	2	8	4.64	1.322	.153
TEP	25	2	5	3.32	1.069	.214

No Of Days		2 Weeks		3 Weeks		4 Weeks		5 Weeks		6-7 Weeks		8-9 Weeks	
		No	%	No	%	No	%	No	%	No	%	No	%
Group	Open	1	1.3%	12	16%	27	36%	18	24%	13	17.3	4	5.3
	TEP	7	28%	8	32%	7	28%	3	12%	0	0	0	0
Total		8	8%	20	20%	34	34%	21	21%	13	13%	4	4%

In comparison to the Open group the TEP group had lesser Time to return to normal activities which has statistically significant t value 4.520 & p value <0.001.

DISCUSSION:

Inguinal hernia repair is the most commonly performed operation by General Surgeons owing to a significant lifetime incidence and variety of successful treatment modalities. Data from developing countries is limited hence the exact prevalence and incidence is not known.

Inguinal hernias are classified as direct or indirect. Inguinal hernias may be congenital or acquired. This distinction is of little importance because the operative repair of these types of hernias is similar. Elective surgery for inguinal hernia is a common and simple operation. Surgical repair is the definitive treatment of inguinal hernias. Over the years, surgeons all over the world have tried various techniques for repair of inguinal hernias. Each procedure had its own advantages and disadvantages.

Open/anterior method of inguinal hernia repairs are subdivided into techniques that employ prostheses to create a tension-free repair and those that reconstruct the inguinal floor using native tissue. The most significant advance to impact inguinal hernia repair is the addition of prosthetic materials to conventional repair include Lichtenstein tension-free hernioplasty, Plug and patch repair, Prolene Hernia System, Stoppa repair.

Laparoscopic tension-free mesh repair of inguinal hernia based on a preperitoneal approach has added to the armamentarium of the general surgeon. The laparoscopic approach provides the mechanical advantage of placing a large piece of mesh behind the defect covering the myopectineal orifice and using the natural forces of the abdominal wall to anchor the mesh in place. The most popular techniques include a totally extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) approach, which have been shown to give results comparable to that of the conventional open procedure with fewer complications.

Demographic data comparing age & sex shows no statistically significant differences between both the groups.

Mean operating time in Open group is 48.53mins & in TEP group is 76.80mins.

The incidence of post-operative complications was significantly different in the two groups with Pearson Chi-Square value14.585 & p value 0.042.

TEP group had lesser duration of Post-Operative Pain which has statistically significant Pearson Chi-Square value 7.367 & p value < 0.025.

TEP group had lesser duration of hospital stay which has statistically significant t value 3.830 & p value <0.001.

TEP group had lesser Time to return to normal activities which has statistically significant t value 4.520 & p value <0.001.

A study by Mikes L Liem, Yolanda Van Der Graaf et al. in 1997 showed patients with inguinal hernias who undergo laparoscopic repair recover more rapidly and have fewer recurrences than those who undergo open surgical repair[1].

A study by C.Tanphiphat, T Tanprayoon et al. in 1998 showed that the Laparoscopic inguinal hernia repair was associated with less early postoperative pain and disability and earlier return to full activities than open repair, but there were no benefits regarding postoperative hospital stay and return to work; laparoscopic repair was also more costly[2].

Cochrane Database of Systemic review by McCormack K, Scott NW, Go PM, et al in 2003 showed all trials demonstrated a faster return to normal activities in the Laparoscopically treated group. However, there is no apparent difference in recurrence between laparoscopic and open mesh methods of hernia repair. The data suggests less persisting pain and numbness following laparoscopic repair. Return to usual activities is faster. However, operation times are longer and there appears to be a higher risk of serious complication rate in respect of visceral (especially bladder) and vascular injuries[3].

A study by Neumayer L, Anita Giobbie-Hurder, et al. in 2004 Controlled trial by the VA cooperative study finding shows significantly increased recurrence rate of primary unilateral hernias at 2yrs with the laparoscopic groups Vs. Open group[4].

A study by Onofrio L, Cafaro D et al. in 2004 showed that the validity of laparoscopic approach to inguinal hernia is confirmed. General anaesthesia and higher costs are reasonable compromises for a shorter period of discomfort in patients with a low ASA index[5].

A study by Bill Zepf, et al. in 2005 showed Laparoscopic repair of inguinal hernias is associated with less pain and quicker return to activity than an open technique, but it has a higher rate of operative complications and a significantly higher recurrence rate of primary hernias[6].

A study by Wara P, Bay-Nielsen M, et al in 2005 showed that the Laparoscopic repair compared favourably with Lichtenstein repair for primary indirect and direct hernias, and unilateral and bilateral recurrent hernias, but was inferior for primary bilateral hernias[7].

A study by McNally MP, Byrd KA, et al. in 2009 showed Laparoscopic inguinal hernia repair is associated with longer operative times but shorter recovery periods. The laparoscopic approach may be a viable option for patients in the expeditionary setting[8].

A study by A Eklund, A Montgomery, et al in 2010 showed 5 years after surgery only a small proportion of patients still report moderate to severe chronic pain. Laparoscopic inguinal hernia repair leads to less chronic pain than open repair[9].

A study by Myers E, Browne KM, et al. in 2010 showed that the TEP repair results in less postoperative pain, a quicker return to normal functional status, and improved quality-of-life outcomes with equivalent recurrence rates when compared to the Lichtenstein's repair[10].

A study by El-Dhuwaib Y, Corless D et al in 2012 showed reoperation is more common after laparoscopic than after open repair of primary but not recurrent inguinal hernia. Surgeons with a low laparoscopic hernia repair caseload have an increased reoperation rate following laparoscopic repair of primary inguinal hernia. The increase in reoperation rate following laparoscopic repair is seen in the first year or two following the initial surgery[11].

CONCLUSION

Though TEP repair is more time consuming than Open Lichtenstein Repair, it is associated with statistically significant different complications profile, lesser post-operative time, lesser duration post-operative hospital stay, & earlier return to normal activities. Hence the overall benefit is better in the TEP repair than the open repair for inguinal hernias.

REFERENCES

1. Mikes L Liem, Yolanda Van Der Graaf et al. Comparison Of Conventional Anterior Surgery And Laparoscopic Surgery For Inguinal-Hernia Repair. The New England Journal of Medicine Vol 336 May 29, 1997 No.22
2. C.Tanphiphat, T Tanprayoon et al. Laparoscopic v/s open inguinal hernia repair. Surgical Endoscopy (1998) 12: 846–851.
3. McCormack K, Scott N W, et al: Laparoscopic techniques versus open techniques for inguinal hernia repair. Cochrane Database Syst Rev 1:CD001785, 2003.
4. Neumayer L, Anita Giobbie-Hurder, et al. Open mesh versus laparoscopic mesh repair of inguinal hernia The New England Journal of Medicine. April 29, 2004; Vol 350: 1819–27.
5. Onofrio L, Cafaro D et al. Tension free laparoscopic versus open inguinal hernia repair. Minerva Chir. Aug 2004; 59(4):369-77.
6. Bill Zepf, et al. Laparoscopic Surgery vs. Open Mesh Repair of Hernia Journal of American Family Physician. 15 Jan 2005; 71(2):378.
7. Wara P, Bay-Nielsen M, et al Prospective nationwide analysis of laparoscopic versus Lichtenstein repair of inguinal hernia. The British Journal of Surgery. 2005 Oct; 92(10):1277-81.
8. McNally MP, Byrd KA, et al. Laparoscopic versus open inguinal hernia repair: Expeditionary Medical Facility Kuwait experience. Military Medicine. 2009 Dec; 174(12):1320-3.

9. A Eklund, A Montgomery, et al. Chronic pain 5 years after randomized comparison of laparoscopic and Lichtenstein inguinal hernia repair. British Journal of Surgery Feb 23, 2010: 600-608.
10. Myers E, Browne KM, et al. Laparoscopic (TEP) versus Lichtenstein inguinal hernia repair: a comparison of quality-of-life outcomes. World J Surg. 2010 Dec; 34(12):3059-64.
11. El-Dhuwaib Y, Corless D, et al. Laparoscopic versus open repair of inguinal hernia: a longitudinal cohort study. Surgical Endoscopy. 2012 Oct 17.