A COMPARATIVE STUDY BETWEEN CONVENTIONAL HERNIOPLASTY AND LAPAROSCOPIC ASSISTED HERNIOPLASTY

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ABSTRACT

BACKGROUND

The groin is one of the natural weak points⁴ of the abdominal wall. The earliest record of inguinal hernia dates back to approx. 1500 BC. Many types of operations were done before, but it was only in the 19th century that the inguinal canal's anatomy was well defined and the greatest contribution towards hernia surgery was by surgeon Edoardo Bassini,¹² as he was the first surgeon to maintain the functional anatomy of the inguinal canal post-surgery. His method was associated with the lowest mortality and recurrence rates up till then. Therefore, he is called as "father of modern herniorrhaphy." Shouldice described multilayered repair in 1953, which was a notable improvement to Bassini's repair method. The recurrence rates in Shouldice repair was done in Shouldice hospital, Toronto, it was less than 1%. Berliner and Lichtenstein¹³ have developed simpler and equally effective methods and are known as modern pioneers of hernia surgery.

Aims and Objectives- This study aims at comparing all aspects of laparoscopic hernioplasty with conventional hernioplasty.¹⁹

1. To compare the early complication rates in LAH and conventional hernioplasty.
2. To compare the postoperative mobilisation, duration of hospital stay, and return to work in LAH and conventional hernioplasty.

MATERIALS AND METHODS

The present study is a non-randomised controlled trial of fifty cases of unilateral inguinal hernia admitted in MY Hospital during the study period from October 2016 to October 2017. I) 50 cases were selected on the basis of convenience sampling method; II) Both direct and indirect unilateral inguinal hernias were selected; iii) After pre-operative preparation, patients were randomly allocated to two groups consisting 25 in each. Group open (Lichtenstein's) and laparoscopic (TEP) repair.

RESULTS

In our study, the youngest participant was 20 years old and the oldest was 65 years old. All participants were men. The youngest patient who underwent Lichtenstein's repair was 26 years old and the oldest was 62 years old. The youngest patient who underwent TEP repair was 23 and the oldest was 60.

CONCLUSION

The gold standard for any procedure should provide a safe, cost effective and long-lasting repair with minimal morbidity and early ambulation. Lichtenstein repair provides a tension free repair, but a larger incision is used.

KEYWORDS

C-Complete, D- Direct, F- Female, IH- Inguinal Hernia, InC- Incomplete, InD- Indirect, LA- Local Anaesthesia, LAH- Laparoscopic Assisted Hernioplasty, M- Male, SAB- Subarachnoid Block.

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BACKGROUND

Laparoscopic transperitoneal closure of the internal orifice using metal clips was first attempted by Ger in 1977. The most popular methods done today are TAPP (Transabdominal Preperitoneal Mesh Repair) and TEP (Total Extraperitoneal Repair).

muscle is then retracted laterally to access the preperitoneal space using balloon trocar. The balloon is inflated to create a working space and also helps ensure haemostasis. Second port (5 mm) is made in midline 2 mm above pubic symphysis and third (5 mm) mid-way between the two ports.

Procedure^{13,20}

The pubic bone is identified by careful dissection, which is the first anatomical landmark. Next important landmark is the inferior epigastric artery. Next step is to identify the cord structures and separate them from our field in order to create a space for laying a mesh. One should exercise precaution to not enter the triangle of doom, injury to which can lead to torrential bleeding. Direct hernias are reduced. An indirect hernia is looked before, which lies superomedial to the deep ring. The sac after being dissected or transected is ligated using an endoloop.

TEP (Total Extraperitoneal Repair)

First port (10 mm) placement just below umbilicus, anterior rectus sheath is divided transversely and underlying rectus

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TAPP (Transabdominal Preperitoneal Repair)²¹

Technique was first described by Arregui in 1991. Pneumoperitoneum is created using a Veress needle through a sub-umbilical puncture. Pressure is maintained at 12 - 15 mmHg. A 10 mm port is introduced above the umbilicus and two 5 mm ports on either side of the umbilical port. The hernial contents are reduced. Direct and small indirect hernias are easily reduced, and large indirect inguinal hernias are dissected. A large mesh covering all three potential areas, i.e. direct, indirect and femoral is placed and fixed to the pubic fascia and Cooper's ligament using EMS stapler. Mesh is covered with the peritoneal flap.

Laparoscopic-Assisted Hernioplasty

Combines the best of both approaches, that is use of endoscopic instruments that enables use of a smallest possible incision yet using a familiar anatomic approach used in conventional hernioplasty.

Complications of Laparoscopic Hernia Repair

1. Nerve injury- most commonly involved are the lateral cutaneous nerve of thigh and femoral branch of genitofemoral nerves.
2. Vascular injury- most commonly the inferior epigastric artery, spermatic vessels.
3. Injury to vas and testicular complications.
4. Long learning curve.

Laparoscopic hernioplasty has only a few added advantages over conventional hernioplasty like less post-op pain and earlier mobilisation, but with the disadvantages of a longer learning curve, complicated procedure.

Objective

- To compare the early complication rates in LAH and conventional hernioplasty.
- To compare the postoperative mobilisation, duration of hospital stay and return to work in LAH and conventional hernioplasty.

Study Design

Descriptive comparative study.

MATERIALS AND METHODS

The present study is a non-randomised controlled trial of fifty cases of unilateral inguinal hernia admitted in MY Hospital during the study period of October 2016 to October 2017. The 50 cases were selected on the basis of convenience and after pre-operative preparation the 50 patients were randomly allocated into two groups consisting 25 in Lichtenstein's repair open group and 25 in laparoscopic (TEP) repair group. Both direct and indirect unilateral inguinal hernias were selected.

Both types of surgeries were informed to the patient in their own language.

Types of Outcome Measures

a) Haematoma, b) Seroma, c) Post-operative pain, d) Length of hospital stay (days), e) Time to return to usual activities.

Source of Data/ Sampling Method and Sample Size

50 cases of unilateral direct or indirect inguinal hernia, adults, admitted to MY Hospital, Indore, MP, India. Out of these, 25 were chosen for Lichtenstein's repair and the remaining 25 for total extraperitoneal repair.

Inclusion Criteria

1. Patients presenting with inguinal hernia.
2. Patients above 20 years of age and below 65 years of age.

Conventional Hernioplasty Procedure

1. The procedure is performed under SAB with all standard OT procedures.
2. A 6 - 8 cm incision is made parallel to the inguinal ligament. Incision is carried down through the Scarpa's fascia to the external oblique aponeurosis.
3. Inguinal region is explored for presence of a direct or indirect inguinal hernia. Hernial sac is mobilised, reduced and then transfixed.
4. A polypropylene mesh is cut accordingly and fixed using prolene 1-0 to the pubic tubercle. A continuous suture is taken to secure the inferior edge of the mesh to the reflected part of inguinal ligament and another continuous suture to secure the superior border to internal oblique muscle. The two free edges of the mesh are also fixed using continuous sutures keeping the mesh loose with a few wrinkles to ensure a tension-free fixation.

Laparoscopic-Assisted Hernioplasty Procedure^{22,23,24}

1. The procedure is performed under SAB with standard OT procedures.^{19,14,17}
2. A 2 cm skin incision is made at the level of internal inguinal region and blunt dissection is done upto external oblique aponeurosis. Cord structures are separated from the inguinal ligament. A 10 mm laparoscopic fan retractor is inserted.

Statistical Analysis

The results of the two types of hernia repairs against the specified outcome measures were analysed with the following statistical methods: - descriptive - crosstabs - chi-square test. SPSS software was used.

RESULTS

In our study, the youngest participant was 20 years old and the oldest was 65 years old. All participants were men. The youngest patient who underwent Lichtenstein's repair was 26 years old and the oldest was 62 years old. The youngest patient who underwent TEP repair was 23 and the oldest was 60.

Mean Age and Standard Deviation (Comparing Cases who Underwent Lichtenstein's Repair and TEP Repair)

	Lichtenstein's Repair	TEP Repair
Mean Age (in yrs.)	47.12	53.04
SD	13.0809	13.61825

The 'p' value is more than 0.05. Hence, there is no relation between the ages of the patients and the procedure they underwent. Lichtenstein's repair and TEP repair.

Presenting Symptoms: Totally 20 patients presented with left-sided inguinal hernia as compared to 30 right-sided hernias.

Valid	Frequency	Percentage
Direct inguinal hernia	27	54
Indirect inguinal hernia	23	46
Total	50	100
Type of Hernia		

Hernia	Open Hernia	TEP	Total
Direct	11	16	27
Indirect	14	9	23
Total	25	25	50
Association of Direct and Indirect Inguinal Hernia Patients with Lichtenstein's and TEP Repair			

'P' value is more than 0.05; hence, it is not significant. There is no statistically significant biasing of a particular type of hernia towards a particular procedure.

Duration of Symptoms

Valid	Frequency	Percentage
< 1 y	22	44
> 1 y	28	56
Total	50	100
Association of Direct and Indirect Inguinal Hernia Patients with Lichtenstein's and TEP Repair		

A higher number of patients presented with complaints for more than 1 year.

	Direct Hernia	Indirect Hernia	Total
Smoker	19	9	28
Non-Smoker	8	14	22
Total	27	23	50
Association between Smoking and Incidence of Hernia			

'P' value is 0.03 (< 0.05), hence significant. This implies that smokers in this study had an increased incidence of direct inguinal hernia.

Valid	Frequency	Percentage
Strenuous work only	23	46
Bronchial asthma only	2	4
BPH only	3	6
Constipation only	2	4
COPD only	1	2
Smoker only	11	22
More than 1 factor	8	16
Total	50	100
Precipitating Factors		

The most important precipitating factor was strenuous work with isolated strenuous work accounting for 46% of the cases.

Sl. No.	Mobilisation from Bed (In hrs.)	
	Conventional Hernioplasty	Laparoscopic Assisted Hernioplasty
1	24	4
2	16	6
3	18	8
4	20	4
5	16	5
6	20	6

Table 1. Mobilisation from Bed after the Procedure

Early mobilisation in laparoscopic assisted hernioplasty.

Surgery	n	Mean Days	SD
Conventional Hernioplasty	25	5.12	2.242
Laparoscopic Hernioplasty	25	2.6	0.866
Total	50		

Table 2. Duration of Hospital Stay (In Days)

'P' value is < 0.001, hence significant. Hence, patients who underwent conventional hernioplasty stayed for a longer time in the hospital compared to those who underwent laparoscopic hernioplasty.

Type of Surgery	n	Mean Time Interval in (Days) of Returning to Work	SD
Conventional Hernioplasty	25	43.72	13.8
Laparoscopic Hernioplasty	25	25.6	12.1
Total	50		

Table 3. Return to Work (In Days)

'P' value is less than 0.05, hence significant. Hence, patients who have undergone laparoscopic hernioplasty can go to normal work earlier than those who underwent conventional hernioplasty.

Sl. No.	Complication ²⁵	LAH	Conventional
1	Pain (relieved with oral analgesics)	15	10
2	Pain (relieved with injectable analgesics)	4	15
3	Wound infections	1	3
4	Bleeding	1	3
5	Urinary retention	1	2
6	Seroma	nil	2

Table 4. Complications

Complications are Higher in Conventional Method

Characteristics	Overall	Mean $\pm$ SD		P
		Lichtenstein's Repair	TEP Repair	
Patients (n)	50	25	25	NS
Mean Age (In yrs.)	50.09 $\pm$ 12.36	47.12 $\pm$ 13.08	53.04 $\pm$ 13.62	NS
Direct Inguinal Hernia	27	11	16	NS
Indirect Inguinal Hernia	23	14	09	NS
Smoker	28	19	09	<0.05
Non-Smoker	22	08	14	NS
Mobilisation after Surgery (hrs.)		19.76 $\pm$ 3.28	5.04 $\pm$ 1.88	S

Duration of Hospital Stay (Days)		5.12+ _{2.24}	2.6+ _{0.866}	S
Return to Work (Days)		43.72+ _{13.8}	25.6+ _{12.1}	S
Table 5. Comparison of Lichtenstein's Repair Group and TEP Repair Group Patients				

DISCUSSION

A comparative study of 25 cases of laparoscopic assisted hernioplasty and 25 of conventional hernioplasty²⁶ were studied and compared in Department of Surgery, MY Hospital, Indore. Pain in LAH was more easily relieved by oral analgesics, whereas that of conventional hernioplasty is more frequently required. Injectable analgesic complications were much less common in laparoscopic-assisted hernia in comparison to conventional hernioplasty. Wound infection although very rare occurred in 2 patients of conventional hernioplasty and was not seen in laparoscopic-assisted hernioplasty. Ambulation, discharge from hospital and return to work was faster in laparoscopic assisted hernioplasty. Complications were more common in conventional hernioplasty and comparatively less common in LAH.

CONCLUSION

The gold standard for any procedure should be to provide a safe, cost effective and long lasting repair with minimal morbidity and early ambulation. Lichtenstein repair provides a tension-free repair, but a larger incision is used. On the other hand, laparoscopic assisted hernia provides a similar tension-free repair with the added benefit of a smaller incision. Therefore, keeping in mind the added benefits of LAH, it should be considered a superior choice for conventional hernioplasty.

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