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Original Research Article

Comparison of early postoperative outcome of laparoscopic and open inguinal hernia mesh repair

Pulkit Garg, Sreekar Agumbe Pai*, Hosamath Vijaykumar

Department of Surgery, Ramaiah Medical College and Hospital, Bangalore, Karnataka, India

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***Correspondence:**
Dr. Sreekar Agumbe Pai,
E-mail: sreekarpai76@yahoo.com

ABSTRACT

Background: Laparoscopic hernia has all the benefits of a tension free repair. The aim of this study was to compare the early postoperative outcome of laparoscopic and open inguinal hernia mesh repair.
Methods: This is a prospective study conducted at Ramaiah hospital Bangalore from June 2016 to July 2017. 70 cases of inguinal were included in the study hernia diagnosed clinically and radiologically who fulfilled the inclusion and the exclusion criteria. The principal operative techniques were laparoscopic hernioplasty (LH) and open inguinal mesh hernioplasty (OH).
Results: 35 patients each were allotted to two group (LH and OH). The mean age was 50.53. LH group had significantly less postoperative pain than the OH group on 12, 24 and 72 hrs (P <0.05). Although the vas pain scores of LH group were also comparatively lower on postoperative day 14, these differences were not statistically significant. Than mean operative time was significantly higher for LH group (131.86 vs 80.29 min) although in bilateral cases the difference was considerably less but was still significant (138 vs 107 min). The mean hospital stay after surgery was less for LH group (2.68 vs 3.25 days) but was not statistically significant. (p = 0.073). Chronic pain persisted for 2 patients (5.7%) in OH group whereas none had chronic pain in LH group.
Conclusions: Laparoscopic hernioplasty is equivalent to open repair in the treatment of inguinal hernia, with less post-operative pain, lower risk of wound infection, shorter duration of hospital stay, and less incidence of chronic pain however requires a long learning curve and is more expensive.

Keywords: Inguinal hernia, Laparoscopic hernioplasty, Open hernioplasty

INTRODUCTION

A hernia is abnormal protrusion of a viscous or a part of a viscous through an opening, irrespective of country, socioeconomic status or race hernia constitutes a major burden on health care.

There are three important landmarks in the history of repair of inguinal hernia: 1) 1888, Tissue repair Eduardo Bassini, 2) 1984 Irving Lichtenstein onlay mesh (tension free) repair, 3) 1990 Laparoscopic Dr Ralph Ger. Schultz. Hernioplasty is the present choice (ideal) for all inguinal and groin hernias. Mesh is placed either onlay/underlay (over conjoint tendon to inguinal ligament) or inlay (in preperitoneal space). Currently there are two methods of mesh placement: open and minimally invasive laparoscopic method.[1,2]

Each procedure had its own advantages and disadvantages. Currently, tension-free open hernioplasty is the procedure most commonly used to treat inguinal hernias. However, with the advances in minimally

invasive surgery, new techniques of laparoscopic hernioplasty have evolved and given equivalent results comparable to that of the conventional open procedure but with fewer complications. Also, some authors favours that laparoscopic procedure is theoretically better to open technique.

Thus, the study to compare the laparoscopic hernioplasty with open hernioplasty is being taken up.

METHODS

Seventy cases with diagnosis of inguinal hernia were included in study admitted under the department of general surgery for a duration of 1 yeat from June 2016 to July 2017. Patients were randomly allocated to two groups; LH group for laparoscopic and OH group for open mesh hernioplasty. The principal technique for LH patients was totally extra-peritoneal mesh hernioplasty (TEP) or Transabdominal Preperitoneal repair (TAPP) and for group B was open anterior mesh hernioplasty (Lichtenstein's repair).

Selection criteria

Patients more than 18years of age with clinical and radiological diagnosis of direct and indirect inguinal hernias, with unilateral or bilateral inguinal hernias and the Patients fit for both laparoscopic and open inguinal hernia were included in the study. Patient were counselled and the choice of surgery (laparoscopic or open) was opted by the patient. Exclusion criteria included patients with recurrent inguinal hernia and patients with large and complicated inguinal hernia.

Methodology

The following post-operative parameters were evaluated -

- Pain
- Complications
- Duration of hospital stay and recovery
- Patients satisfaction

Patients were evaluated post operatively at 0, 12, 24, 48, 72 hours (0 hour being the recovery from anaesthesia) and at day 7 and day 14 for severity of post-operative pain using VAS score and for any evidence of any wound infection and at 3 and 6 months for assessment of postoperative recovery and complications.

Statistical analysis

Descriptive statistical of duration of mean operative time, duration of hospital stays, and postoperative pain and complications were analyzed and summarized in terms of mean standard deviation or median with IQR, complications in both groups were analyzed and summarized in terms of percentage. Independent t test or Mann Whitney test were used to compare duration of stay, operative time, pain score between two groups; chi-square test was used to compare the complications between the 2 groups.

RESULTS

Seventy patients (35 in each group) with diagnosis of inguinal hernia were included in the study and were followed up for a period of 6 months, of which 68 were males and 2 females. Of 35 laparoscopically performed cases, TAPP was done in 19 cases and TEP in 16 cases and all open group patients underwent Lichtenstein's mesh repair.

Age

Minimum age was 20 years and maximum were 87 years. There was no significant difference in terms of age between the groups (Table 1). In total 29 patients had right sided (39%), 27 patients had left sided (36%) and 19 patients had bilateral (25%) hernias. There were no intraoperative complications in either group (Table 1).

Table 1: Patients demography (*statistically significant).

Variables	Categories	Laparoscopic (N=35)		Open Method (N=35)		P-value
		n	%	n	%	
Sex	Males	34	97.1%	34	97.1%	1.00
	Females	1	2.9%	1	2.9%	
		Mean	SD	Mean	SD	
Age	Mean and SD	53.2	15.3	47.9	18.5	0.19
	Range	20-78		18-87		
Side	Unilateral	24	68.6%	28	80.0%	0.27
	Bilateral	11	31.4%	7	20.0%	
Type	Direct	25	71.4%	20	57.1%	0.21
	Indirect	10	28.6%	15	42.9%	

Duration of surgery and hospital stay

The mean hospital stay after surgery was less for LH group (2.68 vs 3.25 days) compared to open group but was not statistically significant (P >0.5). Than mean operative time was statistically significant between the groups though compared only bilateral cases the difference was considerably less but was still significant (P>0.05) (Table 2).

Table 2: Comparison between duration of surgery and hospital stay.

Parameters	LH	OH	t	P-value
Operative time				
- All cases (N=70)	131.86±23.01	80.29±24.22	9.132	<0.001*
- B/L cases(N=17)	138.5±38.28	107.86	3.41	0.0019*
Hospital stay after Sx	2.69±1.05	3.26±1.62	-1.755	0.08

Postoperative pain

At 0, 12, 24 and 72 hours postoperatively, LH patients described significantly less pain than the open group (P <0.05). Although the visual analogue scale (VAS) pain scores of the LH group were also lower than the OH group on postoperative day 14, these differences were not statistically significant (Table 3).

Table 3: Post-operative vas score.

Time	LH		OH			
	Mean	**SD**	**Mean**	**SD**	**t**	**P-value**
Baseline	6.26	1.34	6.51	1.90	-0.819	0.42
12 Hrs	5.66	1.16	6.51	0.98	-3.335	0.001*
24 Hrs	4.80	1.02	5.94	0.68	-5.494	<0.001*
48 Hrs	3.51	1.12	4.69	1.08	-4.455	<0.001*
72 Hrs	2.89	1.05	3.57	0.98	-2.825	0.006*
2 Wks	1.49	1.25	1.34	1.11	0.507	0.61

Complications

1 patient in LH group complained of chronic pain at end of 3 months however they improved by 6 months compared to OH patients which was statistically significant (P<0.05). 2 patients in open group had seroma formation but none in laparoscopic group. LH group had 1 conversion to open due to difficult anatomy. There was no recurrence in either group during a follow up of 6 months (Table 4).

Table 4: Complications.

Complications	LH	0H
Seroma	0	2
Chronic pain - 3 month	2	4
- 6 month	0	2
Recurrence at 6 months	0	0

DISCUSSION

The aim of this study was to compare laparoscopic hernia repair with the open Lichtenstein inguinal hernia repair. The Lichtenstein method has gained a remarkable popularity in recent years. Most surgeons tend to limit the other older repair procedures because of the obvious advantages of this method. Easier surgical technique, better exposure to groin anatomy, better patient comfort, and low rates of recurrence are among the reasons why this tension free procedure has found wide acceptance for the treatment of groin hernia. Developing technology also led surgeons to consider using laparoscopy for the treatment of this frequently seen surgical disease.

Various studies have shown that laparoscopic method of performing a tension-free repair subsequently has a smaller scar, root cause of the hernia is treated , other hernias can be diagnosed and managed at the same sitting like femoral, obturator and opposite side inguinal hernia, low recurrence rates and is associated with substantially less pain in the immediate postoperative period and earlier return to normal activities and disadvantage being long learning curve, technical demand and larger size of mesh when compared to the open-repair technique.[3,4]

Laparoscopic hernia repair is ideal for recurrent and bilateral inguinal hernia although it can be done for primary inguinal hernia also. Mesh Repair has the lowest

recurrence rates with pain as the most common complication.[5]

Several studies have compared TEP and LR.[6] Much of the literature concerning laparoscopic inguinal hernia repair has focused on recurrence rates and recent randomized controlled trials have demonstrated equivalence with the Lichtenstein repair.[7,8]

Inguinodynia is significant complication following Lichtenstein tension-free hernia repair.[9] The ilioinguinal, iliohypogastric and genitofemoral nerves are most commonly involved. Nerve entrapment during removal of the cremasteric covering of the cord and during mesh fixation is considered to cause damage to the nerves.

The National Institute of Clinical Excellence in the United Kingdom published revised guidelines in 2004. It concluded that laparoscopic surgery patients required shorter time to return to their usual daily activities. Meta-analysis of 7 RCTS of TAPP repair showed a approximately 3 days earlier return to normal activities than open repair.[10] Fewer cases of persistent pain (1 year) after laparoscopic repair compared with open repair.[11] The Cochrane Review also demonstrated the same results with less pain and numbness with laparoscopic compared to open surgery.[12] Present result is same in terms of findings of postoperative pain and return to physical functioning.

Laparoscopic repairs seem most promising regarding chronic pain, but the difference between laparoscopic- and the Lichtenstein repair seems to equalize after 3-4 years.[12-14] The incidence of persistent pain was a significant finding of this study. 1 patient in LH group complained of chronic pain at end of 3 months however they improved by 6 months compared to OH group (5.7%). The incidence varies among studies, ranging between 0% and 62.9%.

There was no recurrence in either group during the follow up period. For the open repair, proper placement of the mesh and meticulous dissection of the hernia sac is always enough for a recurrence-free repair. For the laparoscopic procedure, the most important point, to the best of our knowledge, is to fix the mesh to the pubic tubercle and peritonise it in order to prevent mesh migration.

Laparoscopic hernia repair is difficult to learn with a long learning curve, comparatively costlier, carries the risk of visceral and or vascular injuries. Open mesh repair is appropriate for all varieties of inguinal hernias such as irreducible, strangulated, sliding hernia and patients with co-morbidity.[15,16] There are potential benefits for laparoscopic inguinal hernia repair over Lichtenstein's repair for unilateral inguinal hernias in terms of post-operative pain, hospital stay and early return to work.[17]

This study has some limitations. First, there was no preoperative assessment of quality of life. This requires the assumption that there was no baseline heterogeneity between the two groups which may not be the case and is therefore a potential source of bias. Cost has not been taken into consideration and requires longer follow up period.

CONCLUSION

This study concludes that laparoscopic inguinal hernioplasty is better than open hernioplasty in context of less post-operative pain, shorter duration of hospital stay and less risk of wound infection and chronic pain Whereas open surgery have has less risk of serious complications, with shorter learning curve and can be performed under local anaesthesia. However, adverse complications such as nerve injuries, vascular injuries, bowel obstruction, and bladder injury have been reported. Moreover, the incidence of hematoma, seroma and persistent pain are lesser. Also, long period of follow up is required to assess the exact efficacy of this technique.

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