

Original Research Article

A comparative study of laparoscopic technique versus open repair for inguinal hernia

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Abstract

Background: The repair of inguinal hernias has seen an evolution over the past few decades and more research on the same is still underway. Though laparoscopy has gained widespread acceptance in today's era of surgery, there is still a debate between laparoscopic and open hernia mesh repair.

Methods: A randomized prospective study was conducted in the Department of General Surgery Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India from Feb 2016 to Feb 2017 to compare laparoscopic hernioplasty and Lichtenstein's open mesh repair. The study consisted of 100 subjects with unilateral or bilateral inguinal hernia and they were randomly allocated into either group. Various parameters like duration of surgery, intra and post-operative complications, post-operative pain, recurrence, stay in the hospital and resumption of daily activities were compared. **Results:** Out of the 100 patients, 24 had bilateral inguinal hernia and the rest 76 had unilateral. 14 patients with bilateral hernia underwent laparoscopic repair and 10 underwent open mesh repair. 36 patients with unilateral hernia underwent laparoscopic hernioplasty and 40 underwent open mesh repair. The mean operative time for unilateral open hernioplasty was 46.86 mins and bilateral was 91.10 mins whereas, for unilateral laparoscopic hernioplasty it was 65.18 mins and bilateral was 120.55 mins. post-operative complications, like wound infection was noted in 14% (7 out of 50 patients) and 18% had seroma formation (9 out of 50 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, 2% (1) had wound infection but, seroma formation was noted in 12% (6 out of 50 patients). Urinary retention was noted 20% of open hernioplasty group (10 out of 50) and 6% of laparoscopic hernioplasty group (3 out of 50 patients).

Conclusion: Laparoscopic hernioplasty is more beneficial than Lichtenstein's open hernia mesh repair as it is safer, with faster recovery, lesser post-operative complications and reduced morbidity.

Keywords: Inguinal hernia, Lichtenstein's repair, Laparoscopic hernioplasty

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Introduction

Repair of inguinal hernia is one of the commonest operations performed by surgeons around the world. The treatment of this common problem has seen an evolution from the pure tissue repairs to the prosthetic repairs and in the recent past to laparoscopic repair. Preferred approach for open inguinal hernia repair is Lichtenstein's tension free inguinal hernioplasty using a prosthetic mesh.¹

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The recurrence rate is less than 1% in experienced hands as compared to tissue repairs where it may be as high as 15%.² The postoperative morbidity is low and recovery is quick.

Laparoscopy had gained widespread acceptance in today's era of surgery. The advantages and efficacy of laparoscopic cholecystectomy over open cholecystectomy have been well documented and it has become the gold standard for management of gallstone disease³. Several studies have shown the benefit of the laparoscopic hernioplasty over open hernioplasty (OH) in terms of less postoperative pain and morbidity, wound complications, postoperative pain, early resumption of activity and work and better cosmetic results⁴⁻⁶. But it had some limitations like twice longer operative time, longer learning curve, higher hospital

cost, a potential for serious life threatening accidents and a higher recurrence rate especially immediately in early postoperative period as compared with open surgery.

Laparoscopic hernioplasty can be done by two methods; transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) mesh repair. TAPP involves entering the abdominal cavity and direct visualization of the sac and contents, followed by placing the mesh pre peritoneally.⁷ on the other hand, Lichtenstein's open mesh repair is considered the gold standard among all open techniques.⁸

This study aims at comparing the outcome of laparoscopic (TAPP mesh repair) and open hernia repair with respect to the duration of surgery, intra and postoperative complications, postoperative pain, recurrence, stay in the hospital and resumption of daily activities.

Material and methods

A randomized study was conducted in the Department of General Surgery, Indira Gandhi Institute of Medical Sciences, Patna, Bihar, India from Feb 2016 to Feb 2017, after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

The technique, risks, benefits, results and associated complications of the procedure were discussed with all patients. Total 100 patients with unilateral and bilateral inguinal hernia were operated. Sample size was obtained from previous study done by Rathod CM et al.⁹

The study included adults above 18 years of age with unilateral or bilateral primary inguinal hernia. Patients with complicated hernia (irreducible, obstructed,

strangulated), those with large size sac, recurrent hernia were excluded. Also excluded were those 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 etc were excluded from the study

Groups

The patients were divided into two groups of 50 each and randomized in 1:1 ratio using computer random sequence generator to receive either laparoscopic technique or open hernioplasty. Each patient was given a unique identity number. Demographic data, medical history, concomitant medications, physical examination was recorded by the treating surgeon in the study proforma and relevant investigations such as complete blood count and ultrasound abdomen and pelvis were done at the baseline visit.

Patients in group A underwent laparoscopic hernioplasty whereas, patients in group B underwent open hernia mesh repair. For open hernioplasty, Lichtenstein's tension free repair was done under spinal anesthesia. The laparoscopic repair was done by TAPP mesh repair method under general anesthesia. The parameters assessed were operative time, intra and post-operative complications, post-operative pain, recurrence, duration of stay in the hospital and time taken to resume normal daily activities post-surgery. The data was represented as mean±SD. The post-operative pain was assessed using visual analogue pain scale. The mean of two groups were compared using t test and p<0.05 was considered statistically significant

Results

Table 1 Gender and age distribution of patients

Gender	N=100
Male	88
Female	12
Mean age for laparoscopic technique	51.14
Mean age for laparoscopic technique	52.87

Table 2 Type of hernia

Type	Unilateral inguinal hernia	bilateral inguinal hernia	Total
Laparoscopic hernioplasty	36	14	50
Open Hernioplasty	40	10	50
Total	76	24	100

Table 3. Mean duration of surgery

Type	Unilateral inguinal hernia	bilateral inguinal hernia
Laparoscopic hernioplasty	65.18 min	120.55 min
Open Hernioplasty	46.86 min	91.10 min

Table 4. Post-operative complications

Type	Wound infection	Seroma formation	Urinary retention
Laparoscopic hernioplasty	1	6	3
Open Hernioplasty	7	9	10

Table 5. Post-operative pain score

Type	Visual Analogue Scale score		
	POD 0	POD 3	POD 7
Laparoscopic hernioplasty	5.8	4.2	1.7
Open Hernioplasty	6.6	5.0	2.9

Table 6 .Mean duration of hospital stay

Type	No of days
Laparoscopic hernioplasty	4
Open Hernioplasty	7

Table 7 .Time taken to resume daily activities

Type	No. of days
Laparoscopic hernioplasty	5.1
Open Hernioplasty	8.4

Discussion

This study compares the outcomes in patients with unilateral and bilateral inguinal hernias who underwent laparoscopic hernioplasty (TAPP) versus Lichtenstein's open mesh repair. The mean age of the patients was similar in both the groups in our study. This was similar to earlier studies by Hamza et al. and Sudarshan PB et al.^{10,11} Our study analyzed both unilateral and bilateral hernia patients unlike the previous studies such as Sudarshan PB et al.¹¹ which looked into unilateral

hernias only. In our study, 76 had unilateral inguinal hernia and 24 had bilateral. 14 out of those with bilateral underwent laparoscopic hernioplasty and 10 open mesh repairs. The mean operative time for unilateral open hernioplasty was 46.86 mins and bilateral was 91.10 mins whereas, for unilateral laparoscopic hernioplasty it was 65.18 mins and bilateral was 120.55 mins. Rathod CM et al. and Hamza et. reported similar results where laparoscopic mesh repair took longer than Lichtenstein's open mesh

repair.^{9,10} In our study, we did not record any intra operative complications like injury to spermatic cord, vessels and viscera in both the groups. Sudarshan PB et al. and Hamza et al. had reported similar results in their studies.^{10,11} Whereas, Neumayer L et al had reported that 4.8% of laparoscopy patients and 1.9% of open repair patients had intra operative complications.¹² McCormack et al conducted a meta-analysis and noted that operative complications such as visceral, especially bladder and vascular injuries were higher in laparoscopic technique.¹³ Several other older studies had observed higher complications with laparoscopic surgeries.¹⁴⁻²⁰ Post-operative complications, like wound infection was noted in 14% (7 out of 50 patients) and 18% had seroma formation (9 out of 50 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, 2% (1) had wound infection but, seroma formation was noted in 12% (6 out of 50 patients). Urinary retention was noted 20 % of open hernioplasty group (10 out of 50) and 6% of laparoscopic hernioplasty group (3 out of 50 patients). Sudarshan PB et al had reported similar results with respect to seroma formation and urinary retention.¹¹

On comparing the mean pain score of two groups, POD 0 score was not statistically significant (p value 0.1188) but the pain score of POD-3 (p=0.0145) and POD-7 (p<0.0001) were statistically significant. Hence, laparoscopic hernia had significantly lesser pain score on postoperative day 3 and 7. Sudarshan PB et al. had reported similar results in their study¹¹

The mean duration of hospital stays showed a statistically significant difference of 4 days for laparoscopic surgery and 7 days for open hernioplasty (p<0.0001). Sudarshan PB et al. reported that in laparoscopic surgeries it was 3.07 days and 7.8 days post open surgery.¹¹ Singh V et al on the contrary reports a stay of 1.8 days after open surgery and 3.5 days after laparoscopic surgery. The longer duration of stay in laparoscopic surgery was due to complications seen post operatively.²¹

In our study, the mean duration for resumption of day-to-day activities was 5.1 days following laparoscopic hernioplasty and 8.4 days following open hernioplasty which was statistically significant (p< 0.0001). Rathod CM et al reported similar results with p<0.03 where laparoscopy group took 4.56 days and open group took 5.76 days.⁹

The strength of this study is that it compares TAPP mesh repair with Lichtenstein's open mesh repair unlike the previous studies which were TEP only or both and it includes unilateral as well as bilateral hernia. The

limitation of this study is that it doesn't look into a long term follow up and it has excluded complicated hernias.

Conclusion

With our study we were able to infer that laparoscopic hernia repair, though takes longer duration to perform, had nil intra operative, lesser post-operative complications and no recurrence. Patients had lesser duration of hospital stay, lesser postoperative pain and early resumption of daily activities. Inguinal hernia repairs is one of the most common surgical procedures performed and adapting the laparoscopic approach will have a better outcome and reduced morbidity

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