

Comparing the Outcomes of Laparoscopic (TAPP Mesh Repair) and Open Hernia Repair

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Abstract

Aim: The aim of the study 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. **Methods:** A comparative study was conducted in the Department of General Surgery, Madhubani Medical College and Hospital, Madhubani, Bihar, India, for 11 months to compare laparoscopic hernioplasty and Lichtenstein's open mesh repair. The study consisted of 110 patients 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 110 patients, 25 had bilateral inguinal hernia and the rest 85 had unilateral. 17 patients with bilateral hernia underwent laparoscopic repair and 8 underwent open mesh repair. 38 patients with unilateral hernia underwent laparoscopic hernioplasty and 47 underwent open mesh repair. The mean operative time for unilateral open hernioplasty was 48.45 mins and bilateral was 89.16 mins whereas, for unilateral laparoscopic hernioplasty it was 65.38 mins and bilateral was 123.35 mins. post-operative complications, like wound infection was noted in 12.73% (7 out of 55 patients) and 20% had seroma formation (11 out of 55 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, 3.63% (2) had wound infection but, seroma formation was noted in 14.55% (8 out of 35 patients). Urinary retention was noted 21.82 % of open hernioplasty group (12 out of 55) and 7.27% of laparoscopic hernioplasty group (4 out of 55 patients). Mean pain score was noted on post-operative day (POD), POD 0, POD 3 and POD 7 as show in. The mean pain score for; laparoscopic hernioplasty (LH) and open hernioplasty (OH) were POD 0: LH- 5.8 and OH- 6.5 and POD 3: LH- 4.5 and OH- 5.5 but, on POD 7: pain score for LH was 2.1 and OH was 3.4. The mean duration for resumption of day-to-day activities was 5.3 days following laparoscopic hernioplasty and 9.1 days following open hernioplasty. **Conclusions:** Laparoscopic hernia repair is safe and provide less postoperative morbidity in experienced hands compared to open hernia repair.

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]. 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 disease[3]. 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 results[4-6]. 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 accomplished in two ways i.e., trans-abdominal preperitoneal repair (TAPP) and totally extra peritoneal repair (TEP). TEP, like open hernioplasty does not need invasion of the peritoneal cavity. Technically it eliminates the hazards of intra operational injuries. 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 results. 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 accomplished in two ways i.e., trans-abdominal preperitoneal repair (TAPP) and totally extra peritoneal repair (TEP). TEP, like open hernioplasty does not need invasion of the peritoneal cavity. Technically it eliminates the hazards of intra operational injuries. 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 comparative study was conducted in the Department of General Surgery, Madhubani Medical College and Hospital, Madhubani, Bihar, India, for 11 months after taking the approval of the protocol review committee and institutional ethics committee. Total 110 patients with unilateral and bilateral inguinal hernia were operated.

Inclusion criteria

- Patients with unilateral or bilateral primary inguinal hernia.

Exclusion criteria

- Patients with complicated hernia (irreducible, obstructed, strangulated)
- Large size sac
- Laparoscopy or pneumoperitoneum
- Patients with Cardiac diseases, Renal or hepatic diseases
- Bleeding disorders

The patients were divided into two groups of 55 each and randomized in 1:1 ratio using computer random sequence generator

to receive either laparoscopic technique or open hernioplasty. 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 \pm 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

Our study consisted of 110 patients of whom 88 were men (80%) and 22 were women (20%). The mean age group of those who underwent open mesh repair was 54.16 years and laparoscopic technique was 51.25 years.

Table 1: Gender and age distribution of patients

Gender	N=110
Male	88
Female	22
Mean age for laparoscopic technique	51.25
Mean age for laparoscopic technique	54.16

Out of the 110 patients, 25 had bilateral inguinal hernia and the rest 85 had unilateral. 17 patients with bilateral hernia underwent laparoscopic repair and 8

underwent open mesh repair. 38 patients with unilateral hernia underwent laparoscopic hernioplasty and 47 underwent open mesh repair as shown in table 2.

Table 2: Type of hernia

Type	Unilateral inguinal hernia	bilateral inguinal hernia	Total
Laparoscopic hernioplasty	38	17	55
Open Hernioplasty	47	8	55
Total	85	25	110

The mean operative time for unilateral open hernioplasty was 48.45 mins and bilateral was 89.16 mins whereas, for unilateral

laparoscopic hernioplasty it was 65.38 mins and bilateral was 123.35 mins as seen in table 3.

Table 3: Mean duration of surgery

Duration of surgery	Unilateral inguinal hernia	bilateral inguinal hernia
Laparoscopic hernioplasty	65.38 min	123.35 min
Open Hernioplasty	48.45 min	89.16 min

Intra-operative complications like injury to spermatic cord, vessels and bowel were nil in both laparoscopic and open hernioplasty

groups. But, post-operative complications, like wound infection was noted in 12.73% (7 out of 55 patients) and 20% had seroma

formation (11 out of 55 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, 3.63% (2) had wound infection but, seroma formation was noted in 14.55% (8 out of 35 patients). Urinary retention was noted 21.82 % of open hernioplasty group (12 out of 55) and

7.27% of laparoscopic hernioplasty group (4 out of 55 patients). The following results are represented in (table 4). Both groups were followed up for 3 months and there was no mesh rejection and recurrence of hernia. Also, no port site hernia was noted in the laparoscopic group.

Table 4: Post-operative complications

Complications	Wound infection	seroma formation	Urinary retention
Laparoscopic hernioplasty	2	7	4
Open Hernioplasty	8	11	12

Mean pain score was noted on post-operative day (POD), POD 0, POD 3 and POD 7 as show in (table 5). The mean pain score for; laparoscopic hernioplasty (LH)

and open hernioplasty (OH) were POD 0: LH- 5.8 and OH-6.5 and POD 3: LH- 4.5 and OH- 5.5 but, on POD 7: pain score for LH was 2.1 and OH was 3.4.

Table 5: Post-operative pain score

Pain score	Visual Analogue Scale score		
	POD 0	POD 3	POD 7
Laparoscopic hernioplasty	5.8	4.5	2.1
Open Hernioplasty	6.5	5.5	3.4

The average duration of hospital stay was 4.4 days for laparoscopic hernioplasty in

contrast to open hernioplasty which was 7.1 days as seen in table 6.

Table 6: Mean duration of hospital stay

Duration of hospital stay	No of days
Laparoscopic hernioplasty	4.4
Open Hernioplasty	7.1

The mean duration for resumption of day-to-day activities was 5.3 days following laparoscopic hernioplasty and 9.1 days

following open hernioplasty as seen in (table 7).

Table 7: Time taken to resume daily activities

Time taken to resume daily activities	No. of days
Laparoscopic hernioplasty	5.3
Open Hernioplasty	9.1

Discussion

Laparoscopic surgery has led to many changes in the management of surgical patients and significantly reduced the morbidity associated with open surgical procedures[7]. 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 Sudarshan PB et al and Hamza et al.[8,9] Our study analyzed both unilateral and bilateral hernia patients

unlike the previous studies such as Sudarshan PB et al which looked into unilateral hernias only[8,10].

Out of the 110 patients, 25 had bilateral inguinal hernia and the rest 85 had unilateral. 17 patients with bilateral hernia underwent laparoscopic repair and 8 underwent open mesh repair. 38 patients with unilateral hernia underwent laparoscopic hernioplasty and 47 underwent open mesh repair. The mean operative time for unilateral open hernioplasty was 48.45 mins and bilateral was 89.16 mins whereas, for unilateral laparoscopic hernioplasty it was 65.38 mins and bilateral was 123.35 mins. Hamza et al and Rathod CM et al reported similar results where laparoscopic mesh repair took longer than Lichtenstein's open mesh repair[9,11]. 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[8,9]. 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 12.73% (7 out of 55 patients) and 20% had seroma formation (11 out of 55 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, 3.63% (2) had wound infection but, seroma formation was noted in 14.55% (8 out of 35 patients). Urinary retention was noted 21.82 % of open hernioplasty group (12 out of 55) and 7.27% of laparoscopic hernioplasty group (4 out of 55 patients). Sudarshan PB et al had reported similar results with respect to seroma formation and urinary retention[8]. The mean pain score for; laparoscopic

hernioplasty (LH) and open hernioplasty (OH) were POD 0: LH- 5.8 and OH-6.5 and POD 3: LH- 4.5 and OH- 5.5 but, on POD 7: pain score for LH was 2.1 and OH was 3.4. Sudarshan PB et al had reported similar results in their study[8]. 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[8]. V Singh 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 5.3 days following laparoscopic hernioplasty and 9.1 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[11].

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

Laparoscopic hernia repair is safe and provide less postoperative morbidity in experienced hands and definitely had many advantages over open repair such as early resumption of daily activities and work, better subjective and objective cosmetic results with some limitations like more operative time, need of drainage and high recurrence rate. For bilateral and recurrent inguinal hernias laparoscopic approach is recommended.

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