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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 at a tertiary care teaching hospital to compare laparoscopic hernioplasty and Lichtenstein's open mesh repair. The study consisted of 70 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 70 patients, 35 underwent laparoscopic hernioplasty and 35 underwent open hernia repair. The mean operative time for laparoscopic hernioplasty (unilateral 63.44mins, bilateral 123.80mins) was greater than open hernioplasty (unilateral 47.35mins, bilateral 90.42 mins). Post-operative complications, like wound infection, seroma formation and urinary retention were noted more in the open hernioplasty group. The mean pain score for laparoscopic hernia repair was lower than open hernia repair on postoperative day 3 and 7. The average duration of hospital stay was 3.5 days in laparoscopy group and 6 days in open group. The mean duration for resumption of daily activities was 4.8 days following laparoscopic hernioplasty and 8.1 days following open hernioplasty.
Conclusions: 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

INTRODUCTION

Inguinal hernia is a relatively common surgical condition seen across the globe. The repair of inguinal hernias has seen an evolution over the past few decades and more research on the same is still underway.[1] Though laparoscopy has gained widespread acceptance in today's era of surgery, there is still a debate between laparoscopic and open hernia mesh repair.

Several studies have shown the benefits of laparoscopic hernioplasty such as lesser postoperative pain and morbidity, wound complications, early resumption of activity and work. But it had some limitations such as longer operative time, harder learning curve and higher recurrence rate and complications.[2-5]

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.[6] On the other hand, Lichtenstein's open mesh repair is considered the gold standard among all open techniques.[7]

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.

METHODS

A randomized study was conducted involving the patients who presented with unilateral and bilateral inguinal hernia at BGS Global Institute of Medical Sciences. A total of 70 patients were operated in a duration of one year between October 2018 to September 2019. Sample size was obtained from previous study done by Rathod CM et al.[4]

Sample size was calculated using the formula:

$$N = \frac{(r+1)\,(Z_{\alpha/2}+Z_{1-\beta})^2\,\delta^2}{rd^2}$$

The study included adults above 18 years of age with unilateral or bilateral primary inguinal hernia. The study excluded those with complicated hernias, hernia associated with hydrocele or varicocele, recurrent hernias and those who were not fit for general or spinal anesthesia.

The patients were divided into two groups of 35 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

Our study consisted of 70 patients of whom 64 were men (91.43%) and 6 were women (8.57%). The mean age group of those who underwent open mesh repair was 54.86 years and laparoscopic technique was 50.77 years.

Out of the 70 patients, 17 had bilateral inguinal hernia and the rest had unilateral. 10 patients with bilateral hernia underwent laparoscopic repair and 7 underwent open mesh repair. 25 patients with unilateral hernia underwent laparoscopic hernioplasty and 28 underwent open mesh repair as shown in (Figure 1).

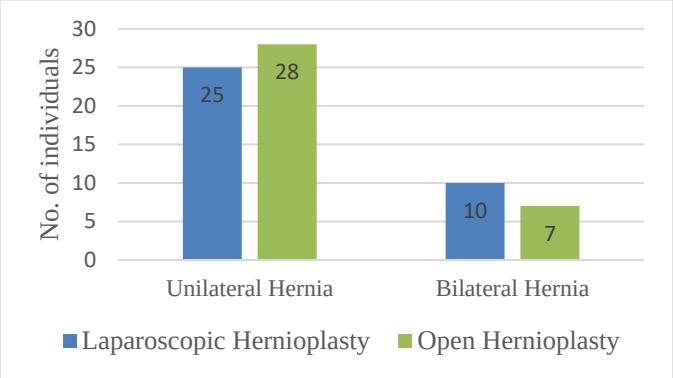

Figure 1: Type of hernia.

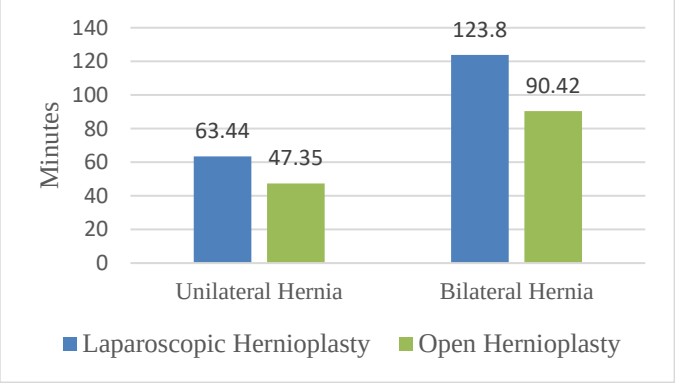

Figure 2: Mean duration of surgery.

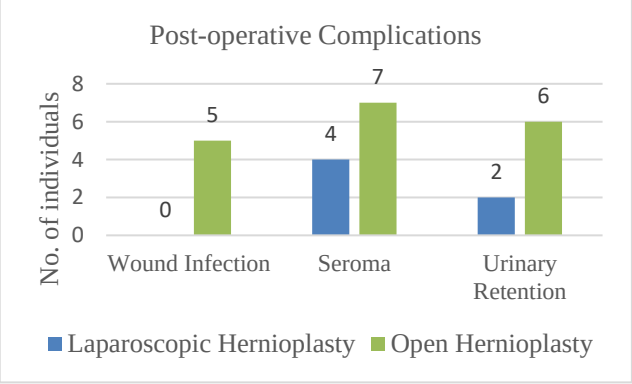

Figure 3: Post-operative complications.

The mean operative time for unilateral open hernioplasty was 47.35mins and bilateral was 90.42 mins whereas, for unilateral laparoscopic hernioplasty it was 63.44mins and bilateral was 123.80 mins as seen in (Figure 2).

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 14.3% (5 out of 35 patients) and 20% had seroma formation (7 out of 35 patients) in the open hernioplasty group. In laparoscopic hernioplasty group, none had wound infection but, seroma formation was noted in 11.4% (4 out of 35 patients). Urinary retention was noted 17.1% of open hernioplasty group (6 out of 35) and 5.7% of laparoscopic hernioplasty group (2 out of 35 patients). The following results are represented in (Figure 3). 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.

Mean pain score was noted on post-operative day (POD), POD 0, POD 3 and POD 7 as show in (Figure 4). The mean pain score for; laparoscopic hernioplasty (LH) and open hernioplasty (OH) were POD 0: LH– 5.6 and OH– 6.3 and POD 3: LH– 4.0 and OH– 4.8 but, on POD 7: pain score for LH was 1.6 and OH was 3.

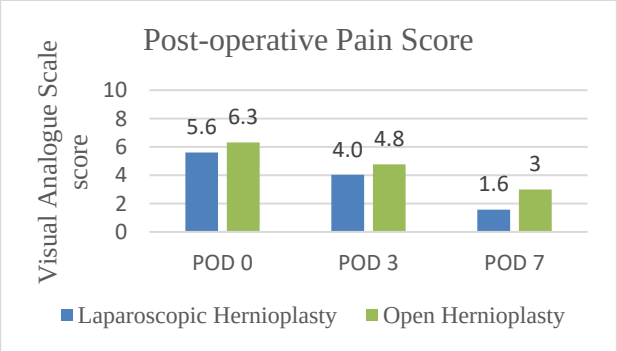

Figure 4: Post-operative pain score.

The average duration of hospital stay was 3.5 days for laparoscopic hernioplasty in contrast to open hernioplasty which was 6 days as seen in (Figure 5).

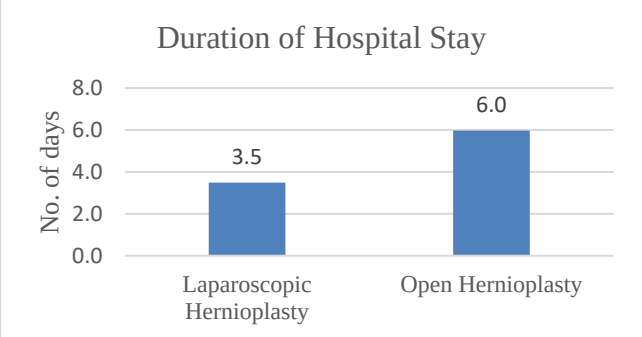

Figure 5: Mean duration of hospital stay.

The mean duration for resumption of day-to-day activities was 4.8 days following laparoscopic hernioplasty and 8.1 days following open hernioplasty as seen in (Figure 6).

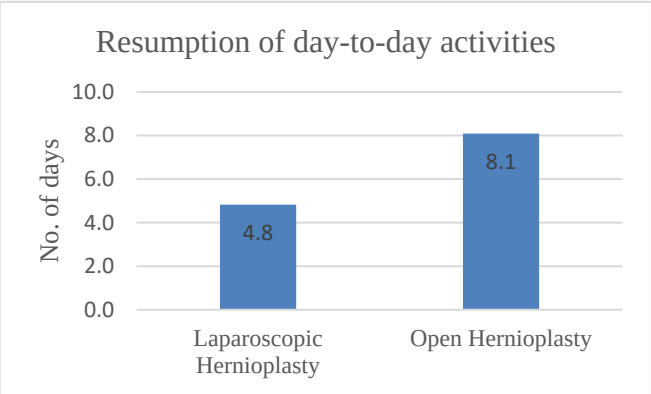

Figure 6: Time taken to resume daily activities.

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 Sudarshan PB et al and Hamza et al. 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.[2,3]

In our study, 53 had unilateral inguinal hernia and 17 had bilateral. 10 out of those with bilateral underwent laparoscopic hernioplasty and 7 open mesh repairs. The mean operative time for unilateral open hernioplasty was 47.35 mins and bilateral was 90.42 mins whereas, for unilateral laparoscopic hernioplasty it was 63.44mins and bilateral was 123.80 mins. Hamza et and Rathod CM et al reported similar results where laparoscopic mesh repair took longer than Lichtenstein's open mesh repair.[2,4]

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.[2,3] Whereas, Neumayer L et al had reported that 4.8% of laparoscopy patients and 1.9% of open repair patients had intra operative complications.[8] 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.[9] Several other older studies had observed higher complications with laparoscopic surgeries.[10-16]

In the open hernioplasty group, post-operative complications, like wound infection was noted in 5

patients (14.3%) and 7 patients had seroma formation (20%). In laparoscopic hernioplasty group, none had wound infection but, seroma formation was noted in 4 patients (11.4%). Urinary retention was noted 17.1% of open hernioplasty group (6 out of 35) and 5.7% of laparoscopic hernioplasty group (2 out of 35 patients). Sudarshan PB et al had reported similar results with respect to seroma formation and urinary retention.[3]

On comparing the mean pain score of two groups, POD 0 score was not statistically significant (p value 0.1148) but the pain score of POD-3 (p=0.0167) 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 study.[3]

The mean duration of hospital stays showed a statistically significant difference of 3.5 days for laparoscopic surgery and 6 days for open hernioplasty (p<0.0001). Sudarshan PB et al reported that in laparoscopic surgeries it was 3.07 days and 7. 8days post open surgery.[3] 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.[5]

In our study, the mean duration for resumption of day-to-day activities was 4.8 days following laparoscopic hernioplasty and 8.1 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.[4]

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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