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Original Research

Short term Outcome of Lichtenstein Tension Free Hernia Repair vs Laparoscopic TAPP

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ABSTRACT:

Background: Inguinal hernia is one among the most common surgical procedures worldwide. Repair of inguinal hernia is one among the commonest surgical procedures worldwide. The aim of this study was to compare the effectiveness and safety of laparoscopic and conventional Lichtenstein repair in the treatment of inguinal hernia. **Materials & methods:** This prospective randomized controlled study had been conducted in Department of Surgery, Government Medical College and Rajindra Hospital, Patiala. A sample of 50 patients was randomized into 2 groups. Randomization was done by draw of lot method. Group A underwent Lichtenstein repair and Group 2 underwent TAPP repair. Clinical outcomes were postoperative pain, hospital stay, recurrence, operative time, time to return to normal activity and cost analysis. **Results:** The mean age of patients in group A was 49.92 ±15.03 years and 46.28±11.46 years for group B (p=0.340). The mean operating time in Lichtenstein repair was 51± 10.61 minutes which was significantly less as compared to laparoscopic TAPP(94±14.53minutes) (p=0.001). Difference in mean hospital stay between laparoscopic TAPP (2.56 days±1.19) and Lichtenstein group (3.84±0.94 days) was significant statistically (p=0.001). Difference in mean duration for return to normal activity was statistically significant among group A and group B (p<0.001). There was one recurrence in Lichtenstein repair group and two in laparoscopic TAPP repair group (p=0.551). Difference of cost between Lichtenstein repair and laparoscopic TAPP repair was statistically significant whether suture (0.031) or tacker (0.049) were used for fixation of mesh. **Conclusion:** Laparoscopic TAPP repair is equally effective procedure for inguinal hernia repair as compared to Lichtenstein repair. Operating time and cost can be minimized with experience of surgeons in laparoscopic TAPP hernia repair.

Key words: Lichtenstein Repair, Hernia, TAPP, Outcomes

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INTRODUCTION

Inguinal hernia is one among the most common surgical procedures worldwide. Repair of inguinal hernia is one among the commonest surgical procedures worldwide. Irrespective of country, race or socio economic status hernia constitutes a major health-care drain. Hernia repair can be achieved by both open and laparoscopic method. The most commonly performed hernia repair nowadays is the Lichtenstein repair. There are mainly two methods of laparoscopic repair: Trans Abdominal Pre-Peritoneal (TAPP) and Total Extra-Peritoneal (TEP) repair.[1-3]

Although several studies have explored the relative deserves and potential demerits of laparoscopic surgery for repair of hernia, most individual trials are too small to indicate clear benefits of one type of surgical repair over other. Moreover there is dearth of similar studies in Indian population. We conducted a study to compare Lichtenstein repair and laparoscopic TAPP as procedures for inguinal hernia repair.[4, 5]

The aim of this study was to compare the effectiveness and safety of laparoscopic and conventional open repair in the treatment of inguinal hernia. The following parameters were evaluated for both laparoscopic and open procedures: Operating time, post-operative pain, hospital stay, recurrence, return to normal activity, and cost analysis.

MATERIALS & METHODS

This prospective randomized controlled study had been conducted in Dept of Surgery, Government Medical College and Rajindra Hospital, Patiala. A sample of 50 patients underwent inguinal hernia repair as an elective surgery. Patients were randomized into 2 groups. Randomization was done by draw of lot method. Group A had undergone Lichtenstein open hernia repair and Group 2 had undergone TAPP

hernia repair. Patients with obesity with BMI > 30, significant chest disease, patient on anticoagulants, pregnancy, unfit for GA, patient below 18 years were excluded while patients fit for GA, above 18 years of age, ASA grade 1 and 2 and patients consenting for surgery were included in the study materials used were prolene mesh of size 12*15 cm for group B and 6*3 cm for group A; various sutures and tacker. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test and student t test were used for evaluation of level of significance. p- value of less than 0.05 was taken as significant.

RESULTS

20 patients of group A (Lichtenstein repair) had right inguinal hernia and 5 patients had left inguinal hernia. 15 patients of group B (laparoscopic) had right inguinal hernia and 10 patients had left inguinal hernia (p= 0.123). The mean age of patients undergoing group A (Lichtenstein inguinal hernia repair) was 49.92 ±15.03 years and 46.28±11.46 years for group B (laparoscopic TAPP inguinal hernia repair) (p=0.340). Operating time was calculated from the time of giving skin incision to wound closure. In our study, the mean operating time in Lichtenstein repair was 51± 10.61 minutes which was significantly less as compared to laparoscopic TAPP (94±14.53minutes) (p=0.001). Hospital stay was less in group B (laparoscopic TAPP) as compared to group A(Lichtenstein repair). 2(8%) patients were discharged on post-operative day 1 in group A ; one(4%) patient was discharged on post-operative day 2;9(36%) patients on day 3,9(36%) patients on day 4;5(20%) patients on day 5 and one(4%) patient on day 6. In group B, 2 (8%) patients were discharged on post-operative day 1; 13(52%) patients on day 2; 7(28%) patients on day 3 and 2(8%) patients on day 4. Only one (4%) patient of group B had hospital stay of 7 days. It was due to associated cardiovascular disease of the patient detected postoperatively. Difference in mean hospital stay between laparoscopic TAPP (2.56 days±1.19) and Lichtenstein group (3.84±0.94 days) was significantly statistically (p=0.001).

In our study, duration for return to normal activity in group B (laparoscopic repair) was 13.76±2.79 days and for group B (Lichtenstein repair), it was 18.6 ±2.61 days. 6(24%) patients of group A returned to normal activity in 11-15 days, 11(44%) patients in 16 -20 days and 8(32%) patients in 21-25 days.3(12%) patients on group B returned to normal activity in 6-10 days, 18 (72%) patients in 11-15 days, 3(12%) patients in 16-20 days and 1(4%) patient in 20-25 days. Difference in mean duration for return to normal activity was statistically significant in between group A (Lichtenstein repair) and group B (laparoscopic repair) (p<0.001). There was one recurrence in open Lichtenstein repair group and two in laparoscopic TAPP repair group (p=0.551). In our study, cost for Lichtenstein repair(Group X) was between rupees 3300-3600 while in laparoscopy, it was between rupees 4100-4400 where suture (Group Y) was used for mesh fixation (11/25 patients) and rupees 20200-20400 where tacker (Group Z) was used for mesh fixation (14/25 patients). Difference of cost between Lichtenstein repair and laparoscopic TAPP repair was statistically significant whether suture (0.031) or tacker (0.049) was used for fixation of mesh.

DISCUSSION

Inguinal hernia is one of the most common surgical problems meriting elective surgery all over the world spanning all age groups.[6] All the patients included in our study were males between the age group of 18-70 years. In our study, we found that 32(64%) of study population had right sided inguinal hernia and 18(36%) had left inguinal hernia. 26 patients had indirect inguinal hernia and 24 patients had direct inguinal hernia. Post-operative pain is an important outcome to consider between laparoscopic TAPP and Lichtenstein repair of inguinal hernia. In our study, the pain scores (as per analogue scoring) were significantly less in TAPP repair as compared to Lichtenstein repair at 6 hrs, 12 hrs, 24 hrs and 48 hrs(p=0.001). Pain scores were less in laparoscopic TAPP group as compared to Lichtenstein group at day 7, day 14 and 1 month but they were found to be statistically insignificant. A meta-analysis published by Karthikesalingam A et al[3] in 2010 used chronic pain as a primary outcome and found no significant difference between the laparoscopic and open cohorts. However, these results differ from many other reports including the 2003 Cochrane database systematic review by McCormack et al[4], which reported less persisting pain (overall 290\2101 versus 459\2399,p<0.0001) in the laparoscopic groups as compared to Lichtenstein group.

Table 1: Mean pain score analysis at various intervals of study in group A and group B.

Post-Operative Pain	Group A	Group B	t-test	p value	Sign.
6 Hours	6.76±0.78	5.25±0.94	6.076	0.001	HS
12 Hours	6.68±0.75	4.92±0.64	8.935	0.001	HS
24 Hours	4.76±0.66	3.68±0.63	5.915	0.001	HS
Day 2nd	3.44±0.65	2.76±0.52	4.073	0.001	HS
Day 3rd	1.96±0.68	1.92±0.57	0.226	0.822	NS
Day 7	1.60±0.50	1.44±0.51	1.124	0.267	NS
Day 14	0.80±1.04	0.56±0.65	0.978	0.333	NS
1st Month	0.28±0.68	0.16±0.55	0.685	0.496	NS

In a study by Anadol ZA et al in 2004, mean pain scores for Lichtenstein repair were significantly higher than corresponding scores for TAPP group ($p<0.05$). Thus, patients undergoing laparoscopic surgery have reported lower pain scores as compared to Lichtenstein repair owing to the smaller incisions made and lesser tissue dissection in laparoscopic surgery.[5]

In our study, the operative time was significantly less in open Lichtenstein hernia repair than in laparoscopic repair. With respect to operative time, most studies in literature point towards a lesser operative duration with Lichtenstein repair as compared to laparoscopic TAPP. The 2003 Cochrane database systematic review by McCormack et al[4] demonstrated that the duration of operation was longer in the laparoscopic groups ($p<0.0001$). A meta-analysis by Karthikesalingam[3] in 2010 described an increase of 15.2 min with laparoscopic inguinal hernia repair ($p<0.001$). According to a meta-analysis by Jain SK and Norbu C[6] in 2005, laparoscopic groin hernia repair takes longer than open mesh repair. A review from 29 randomized clinical trials by Memon et al[7] concluded that patients who underwent laparoscopic repair of groin hernia had longer duration of surgery. However, Wang WJ et al[8] in 2013 did not find any significant difference among Lichtenstein repair and laparoscopic TAPP.

In our study, operative time is significantly more in laparoscopic TAPP group in comparison to Lichtenstein repair group (43.4 minutes, $p<0.001$). Results of our study are comparable to majority of other studies. The longer duration of surgery in laparoscopic inguinal hernia is probably due to the increased complexity and technical difficulty of the surgery with less experienced surgeons and steeper learning curve. Hence, it is expected to take more time to complete the procedure.

Table 2: Operative time in different studies

Study	Laparoscopic TAPP	Lichtenstein repair
McCormack K et al[4]	14.81 min longer	Shorter
Memon et al[7]	15.2 min more	Shorter
Jain S et al[6]	13.3 min more	Shorter
Karthikesalingam et al [3]	Longer Shorter	Shorter
Wang WJ et al[8]	No difference	No difference
Present study	94 min	51 min

Duration of hospital stay is an important factor for determining the patient satisfaction and burden on health sector. It depends on patient co-morbidities and type of surgery performed. In our study, mean hospital stay after laparoscopic TAPP was 2.56 days and after Lichtenstein repair, it was 3.84 days($p<0.05$) . Gong K et al[9] in 2011 demonstrated that hospital stay was significantly longer in open repair group as compared to laparoscopic group ($p<0.001$). Anadol ZA et al[5] in 1998 stated that mean hospital stay was 2.24 ± 0.97 days in open group and 1.52 ± 0.51 days in TAPP group, which was significant statistically ($p=0.05$).However, EU hernia trialists collaboration[10] in 2000 stated that length of stay did not differ significantly between TAPP and Lichtenstein group. The results of our study are comparable to most of the studies. Owing to the lesser pain, less tissue destruction and less invasion in laparoscopic surgery, patient is discharged early from the hospital.

Recurrence is one of the most important measurable outcomes of the hernia repair surgery. Frequency of hernia recurrences depends on variety of factors such as type of hernia, co-morbidities of patient and experience of surgeon in laparoscopic hernia repair. In our study, there were 2 recurrences in laparoscopic group and 1 in open hernia repair group at 1 month. Douek M et al[11] in 2003 stated that there was recurrence in 2 cases of TAPP (n=122) and 3 cases of Lichtenstein repair (n=120). It was found to be insignificant statistically. Pokorny H et al[12] in 2008 had recurrence in 4.7% of cases in laparoscopic group while there was no recurrence in Lichtenstein repair. In a study by Aitola et al[13] in 1998, recurrence rate in the laparoscopic group was 13% and in open group, it was 8%.Although most of the studies indicate towards more recurrence or equal in laparoscopic group as compared to Lichtenstein group, but differences are not significant. Thence there is no clear consensus in the literature, there may be marginal benefit in terms of recurrence in Lichtenstein repair versus laparoscopic TAPP depending upon surgeon's expertise and experience in laparoscopic surgery.

Another variable that is used as an outcome in our study was duration for return to normal activity. In our study, mean duration of return to usual activity for laparoscopic surgery is 13.76 days and for Lichtenstein repair, it is 18.6 days($p<0.001$). Memon et al[7] in 2003 stated that LIHR is associated with significant reduction in time to return to normal activities. A review of Cochrane database by McCormack K et al[4] found that time to return to normal activity was shorter in laparoscopic surgery as compared to open inguinal hernia. However Lawrence K et al[14] did not find any significant difference in return to normal activities in two groups. Paganini AM et al[15] also stated that there was no significant difference in return to normal activity between laparoscopic group and Lichtenstein group.

In our study, cost for open surgery was 3300-3600 rupees while in laparoscopy, it was 4100-4400 Rupees (suture) and 20200-20400 (tacker). Difference of cost between laparoscopic TAPP and Lichtenstein repair is statistically significant ($p<0.05$) One of the major criticisms of laparoscopic hernia repair is increased cost as compared with open repair, which has been consistently demonstrated by many studies. In a study by Lawrence K et. al[14], total theatre costs were higher in the group that had laparoscopic repair (mean cost for laparoscopic repair 850 pounds and mean cost for open repair 268 pounds). Wellwood J et al[16] found

that health service cost of day case laparoscopic repair is 335 Euros more than the cost of Lichtenstein inguinal hernia repair, Cost analysis comparing laparoscopic and open surgery is a complex task. Accurate estimation of cost includes the integration of all operative, hidden and indirect costs. Operating room cost of TAPP is high due to costly surgical equipments and other consumables in laparoscopic surgery. Since laparoscopic surgery leads to less DALY losses to the patient, cost of surgery to the patients is comparable. Operating room cost will come down once laparoscopic TAPP becomes a widely acceptable procedure and familiar to more and more surgeons. Most of the studies have found that laparoscopic hernia repair is costly while comparing operating room cost. Results of our study are comparable to most of these studies.

CONCLUSION

Laparoscopic Trans Abdominal Pre-Peritoneal repair of inguinal hernia is safe and efficient as compared to Lichtenstein repair and should be an available option for all patients requiring elective hernia surgery. Thus it can be concluded that laparoscopic TAPP repair is equally effective procedure for inguinal hernia repair as compared to Lichtenstein repair. Operating time, recurrence and cost can be minimized with experience of surgeons in laparoscopic hernia repair.

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