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Laparoscopic Transabdominal Preperitoneal Repair is Better than Open Lichtenstein Hernioplasty in Inguinal Hernia Surgery in Terms of Initial Outcome

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Abstract

Background: Inguinal hernia is the most commonly done surgery in general surgical practice. Recently laparoscopic techniques (Transabdominal pre peritoneal / totally extraperitoneal approach) are becoming popular than open techniques. Its advantages include decreased hospital stay postoperatively, earlier return to work, decreased post-operative pain, minimum surgical incisions and so better cosmetic results and lesser postoperative complications. Despite many benefits, laparoscopic technique have some disadvantage including surgical costs , operation time and instruments facility. To find out a safe and better surgical technique for inguinal hernia repair and to compare initial outcome of laparoscopic (TAPP) with open Lichtenstein technique for inguinal hernia repair.

Materials and methods: This study was conducted in the Department of Surgery, Sylhet MAG Osmani Medical College Hospital (SOMCH) Sylhet. Patient underwent mesh repair of inguinal hernia were enrolled for study and allocated in to two groups, 26 patients in each group. The group-A (Case) treated by laparoscopic Transabdominal preperitoneal repair and group-B (Control) treated by open Lichtenstein hernioplasty.

Results: There was no significant difference between two groups in respects to demographic features and ASA status.On comparison between groups, it is evident that frequency of wound infection was 7.2% in group-A. Whereas this frequency was higher, e.g. 30.8% in group-B. Similarly intensity of pain was higher in group-B as compared with group-A. In this study patients in the group-B had higher VAS, during the 1st POD (p = 0.0001), compared with the group-A. Mean verbal pain score was 5.2±0.47 and 7.4±0.68 in group A & group B respectively. The difference was statistically significant. On 3rd POD, both groups showed downward trends of the pain VAS, but significantly in group A. Mean score was 3.1±0.32 and 5.2±0.51 in group A and group B respectively. Therefore it is concluded from the study that Lichtenstein inguinal hernia repair is associated with worse postoperative outcome in the means of wound infection, severe pain and analgesic requirement than laparoscopic TAPP technique. Present study also shows that duration of hospital stay was prolonged in group-B (3.1 days vs. 8.5 days in group-A and B respectively), the difference was statistically significant (p < 0.0001).

Conclusion: In our study we have come to a conclusion that laparoscopic repair of inguinal hernia have a considerable short term clinical advantage than open hernia repair.

Key words: ASA status; Open lichtenstein hernioplasty; Visual Analogue Scale (VAS).

Introduction

Though Inguinal hernia is a common surgical problem, it can be a surgical dilemma for the experienced surgeon when it present with some unusual contents. However watchful waiting is an acceptable strategy for minimally symptomatic hernias, the ultimate treatment of inguinal hernias, regardless of their origin or type, is surgical repair.[1] The causes of inguinal hernias remains uncertain even though the life-time risk of developing an inguinal hernia is 27% for men and 3% for women.[2] The chance of inguinal hernia increases with age, and the annual incidence is around 50% by the age 75.[3] The prevalence of inguinal hernia is approximately 1.7% for all ages and 4% for those over 45 years worldwide.[4] Despite the fact that open, mesh-based, tension-free repair remains the criterion standard, laparoscopic herniorrhaphy, in the hands of competently trained surgeons, produces excellent results comparable to those of open repair.[5] The risk factors for developing an inguinal hernia can be divided into patient risk factors such as age and

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sex and external risk factors such as physically demanding work. Abnormal collagen metabolism is thought to play a key role in the development of primary inguinal hernia. An increase of type III collagen (The thin isolated fibres) leads to a decreased ratio of type I, (The thick fibre bundles) to type III collagen. This change the physical properties and the strength of the collagen matrix of the abdominal wall and may lay open individuals to development of inguinal hernias.[6] At present there is no medical recommendation about how to manage an inguinal hernia condition, due to the fact that until recently, elective surgery used to be recommended for all inguinal hernias. The basis for this recommendation is the feared risk of complications such as incarceration or strangulation.[7] Although in most cases, surgical repairs are not performed to prevent strangulation, but because of patients' request, to alleviate discomfort.[8] Watchful waiting therefore is a suggested reasonable option, especially for minimally symptomatic hernias, due to the significant risk of chronic post herniorraphy pain (>10%), and the low risk of incarceration (<0.2% per year).[9] TAPP needs general anaesthesia but Lichtenstein hernioplasty is usually done with regional anesthesia,even can be done with local anaesthesia. Open techniques for inguinal hernia repair include i) Tension-free mesh repairs ii) Tension-free suture repairs (Desarda) iii) The older method of tension suture repairs.[10] The two main laparoscopic inguinal hernia repairs are the Totally Extraperitoneal (TEP) and Transabdominal Preperitoneal Patch (TAPP) repairs and each is regarded as tension-free and needs the use of mesh.[11] When executed by a surgeon skilled in laparoscopic hernia repair, there are fewer complications than Lichtenstein, particularly less chronic pain and numbness and return to usual activities is faster.[12-14] Lichtenstein repair has shorter operating time, and is less expensive.[15] To find out a safe and better surgical technique for inguinal hernia repair and to compare initial outcome of laparoscopic (TAPP) with open Lichtenstein technique for inguinal hernia repair.

Materials and methods

This is a case control study which was performed on 52 patients who underwent laparoscopic TAPP and Lichtenstein mesh hernioplasty from 3rd march 2019 to 3rd march 2020 at Department of Surgery, Sylhet MAG Osmani Medical College Hospital. Ethical approval was obtained from the SOMCH ethical review board. Eligible patients were selected according to inclusion and exclusion criteria. Patient underwent mesh repair for inguinal hernia were allocated in to two groups, 26 patients in each group. The group-A (Case) treated by laparoscopic Transabdominal preperitoneal repair and group-B (Control) treated by open Lichtenstein hernioplasty. Convenient sampling technique was applied in this study. Written informed consent was taken from participants. Laparoscopic hernia repair, using TAPP technique with three port sites were carried out in 26 patients under general anesthesia. A posterior -based rectangular peritoneal flap was acquired to expose the internal ring, inferior epigastric vessels, the floor of the inguinal canal and Cooper's ligament. A 15 x 15 cm polypropylene mesh by Ethicon was placed in the preperitoneal space covering all three possible hernia sites and fixed with prolene 2-0 round body suture to Cooper's ligament and the abdominal wall. Once secured the mesh was covered by repairing the peritoneal flap by 2-0 Vicryl round body suture. The open repair was performed in 26 patients according to technique described by Lichtenstein and using 15 x 7.5 cm polypropylene mesh under spinal anaesthesia. All patients were given 1.5gm of prophylactic injectable Cefuroxime at the time of induction of anaesthesia. All patients were given 1ml of 30mg Ketorolac intramuscular 12 hourly for 1st 24 hours and injectable pethidine as rescue analgesic postoperatively. The subsequent dose of drug was given on demand by a nurse. All patients were followed up for first 24 hours and at 3rd post-operative day. Then patient discharged if patient condition suggest. Routine control visits were performed at day 07, 02 week.

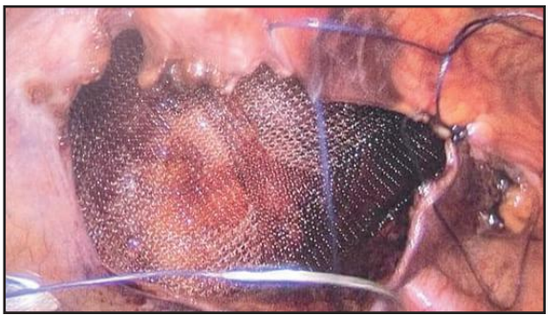

Figure 1 Closure of peritoneal flap

All the information recorded in questionnaire. All the collected data questionnaire were checked very carefully to identify errors in collecting data. Data processing work consisted of registration of schedules, editing, coding and computerization, preparation of dummy tables, analysis and matching data. Categorical variables were summarized as percentages. Quantitative variables were summarized as mean standard deviation. Test for association between groups and categorical variables was performs using chi-square test. For quantitative variable means will compare by student t test. $p<0.05$ was accepted as statistical significant.

Results

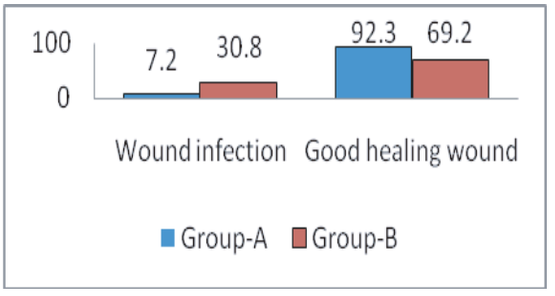

Figure 2 Frequency of wound infection between groups (n=52)

Present study demonstrated that, frequency of wound infection after uncomplicated inguinal hernia surgery is 19.2%. On comparison between groups, it is evident that frequency of wound infection was 7.2% in group-A. Whereas this frequency was higher, e.g. 30.8% in group-B. As a result, it is seen that Lichtenstein inguinal hernia repair is associated with worse postoperative outcome in the means of wound infection than laparoscopic TAPP technique.

Table I Assessment of postoperative pain using Visual Analogue Scale (VAS) (n=52)

VAS score	Group A (n = 26) No. (%)		Group B (n = 26) No. (%)		p value
	n	%	n	%	
1st POD					
0-2	6	23.0	2	7.69	
3-6	12	46.1	13	50.0	
7-10	8	30.7	11	42.3	
Mean±SD	5.2	±0.47	7.4	±0.68	0.001[s]
3rd POD					
0-2	11	40.0	5	19.2	
3-6	15	60.0	17	65.3	
7-10	0	0	4	15.3	
Mean±SD	3.1	±0.32	5.2	±0.51	0.001[s]
7th POD					
0-2	18	69.2	12	46.1	
3-6	8	30.7	14	53.8	
7-10	0	0	0	0	
Mean±SD	2.1	±0.23	2.8	±0.27	0.091[ns]

Patients in the group-B had higher VAS, during the 1st POD (P = 0.0001), compared with the group-A. Mean verbal pain score was 5.2±0.47 and 7.4±0.68 in group A and group B respectively. The difference was statistically significant. On 3rd POD, both groups showed downward trends of the pain VAS, but differ significantly in between groups. Mean score was 3.1±0.32 and 5.2±0.51 in group A and group B respectively. At the 7th POD, almost all patients had no pain.

Table II Distribution of the study patients according to post-operative analgesic requirement (n=52)

Post-operative analgesic requirement	Group A (n = 26) No. (%)	Group B (n = 26) No. (%)	p value
	Mean±SD	Mean ±SD	
Inj. Pethidine	5	18	0.0001[s]
Time of 1st demand of analgesic (Min)	229.7±24.2	103.8±39.2	0.0001[s]
Total analgesic requirement in 24 hrs (mg)	32.6±8.3	112.5±12.8	0.0001[s]

Table shows the Distribution of the study patients according to post-operative analgesic requirement. Post operatively1st demand of analgesia was earlier in Group-B. The difference was statistically significant (p=<0.0001). Total analgesic requirement was higher in Group-B, which was statistically significant (p=< 0.0001).

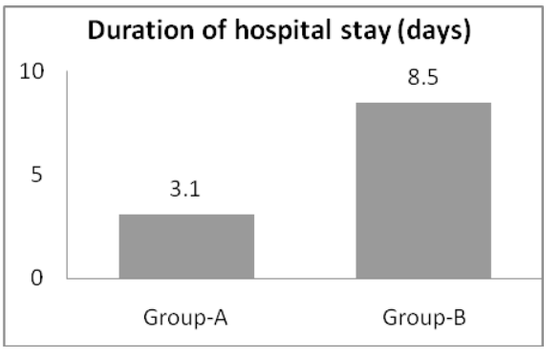

Figure 3 Comparison of length of hospital stay (n=52)

Figure shows the length of hospital stay. Duration of hospital stay was prolonged in group-B (3.1 days vs. 8.5 days in group-A and B respectively), the difference was statistically significant ($p < 0.0001$).

Discussion

No significant differences were foundstatistically between the groups by factors like sex, age, laterality, body mass index, tobacco use, occupation, American Society of Anaesthesiologists risk groups, comorbidities. Findings are consistent with result of other study.[16]

Present study demonstrated that, frequency of wound infection was 19.2%. On comparison between groups, it is evident that frequency of wound infection was 7.2% in group-A. Whereas this frequency was higher, e.g. 30.8% in group-B. Similarly, intensity of pain was higher in group-B as compared with group-A. Post operatively1st demand of analgesia was earlier in Group-B. The difference was statistically significant (p=< 0.0001). Total analgesic requirement was higher in Group-B, which was statistically significant (p=< 0.0001). So, it is confirmed that Lichtenstein inguinal hernia repair is associated with worse postoperative outcome in the means of wound infection, severe pain and analgesic requirement than laparoscopic TAPP technique.

In the largest American trial to date, the Veterans Affairs Cooperative Study randomized 1,983 patients to open or laparoscopic hernia repair. Two-year follow-up was completed with 85% of the patients. Outcome was better in laparoscopic surgery. There were twofold more recurrence (10%, 1% vs. 4%, 9%), a slightly higher complications rate (39%, 0% vs. 33%, 4%), but reduced pain and earlier return to work in the laparoscopic group than in the open mesh group.[17]

In this study patients in the group-B had higher VAS, during the 1st POD (P = 0.0001), compared with the group-A. Mean verbal pain score was 5.2±0.47 and 7.4±0.68 in group A and group B respectively. The difference was statistically significant. On 3rd POD, both groups showed downward trends of the pain VAS, but significantly in group A. Mean score was 3.1±0.32 and 5.2±0.51 in group A and group B respectively. At the 7th POD, almost all patients had no pain. So overall finding suggested that, laparoscopic technique reduced the postoperative pain significantly. Sudarshan PB et al. analysed the pain score between the two groups, it was not statistically significant on Post Operative Day (POD) 0. But there was statistically significant difference in pain on POD 3 and POD 7.[18]

Present study shows that duration of hospital stay was prolonged in group-B (3.1 days vs. 8.5 days in group-A and B respectively), the difference was statistically significant ($p < 0.0001$). Sudarshan PB et al. reported, mean duration of stay for open hernioplasty patients was 7.8 days as compared to stay for laparoscopic hernioplasty patients, which was 3.07 days.

Limitations

This study also had some limitations. The limitations of the studies were as follows:

- It was a single centre study. Only patients admitted in Sylhet MAG Osmani Medical College Hospital were taken for the study. So this will not reflect the overall picture of the country. A large scale study needs to be conducted to reach to a definitive conclusion
- Small sample size.

Conclusion

According to our study we reach a conclusion that laparoscopic repair of inguinal hernia have a considerable short term clinical advantage than open hernia repair. The laparoscopic approach to inguinal hernia surgery is a safe and reliable method. It appears that the laparoscopic technique has a reduced rate of infection compared with open repair. Some of these important aspects include the incidence of postoperative pain and hospital stay. Because the laparoscopic technique has manifest clear advantages regarding less postoperative pain and analgesic requirement,

early return to normal activities, and a decrease in the incidence of wound infection and hematoma, it should be regarded as an appropriate approach for inguinal hernia surgery.

Recommendations

Although hernia is a common surgical disease,the latest knowledge of herniology, conscientious surgical approach are important for proper repair of inguinal hernias for better outcome, to reduce infection rate, and careful handling of these unusual contents of inguinal hernias, to avoid damage to some of these structures.

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Contribution of authors

BP-Conception, design, acquisition of data, data interpretation, manuscript writing and final approval.

KZA-Analysis, critical revision and final approval.

FM-Conception, analysis, data interpretation, drafting and final approval.

MAA-Data interpretation, critical revision and final approval.

AH-Analysis, data interpretation, critical revision and final approval.

SA-Analysis, critical revision and final approval.

Disclosure

All the authors declared no competing interest.

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