EVALUATION OF OUTCOME OF TOTALLY EXTRA PERITONEAL LAPAROSCOPIC INGUINAL HERNIA REPAIR WITH LICHTENSTEIN OPEN REPAIR

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ABSTRACT

Objective: The objective of this study was to evaluate outcome of total extraperitoneal laparoscopic inguinal hernia repair with Lichtenstein open repair in terms of postoperative pain.

Study Design: Quasi experimental study.

Place and Duration of Study: Surgical unit I Rawalpindi and Allied hospitals from January to June 2012.

Patients and Methods: Sixty patients, with unilateral, primary, inguinal hernia were alternately allocated to undergo either total extraperitoneal (TEP) laparoscopic repair of inguinal hernia or Lichtenstein tension free, mesh repair of inguinal hernia. Pain scores at 12, 24, and 48 hours and at 7 days of follow up were noted using a visual analogue scale. Total number of intravenous injections of Diclofenac Sodium requested by the patient for pain relief was also noted.

Results: At 12 hours after surgery, the mean pain scores in the TEP group were 3.1 ± 1.8 and in the Lichtenstein group they were 4.2 ± 2.1 (p 0.031). At 24 hours after surgery, the scores were 2.3 ± 1.5 and 3.1 ± 1.9 for the TEP and Lichtenstein groups, respectively (p = 0.026). At 48 hours after surgery, the mean pain scores in the TEP group were 1.5 ± 1.1 while in the Lichtenstein group they were 2.0 ± 1.6 (p = 0.041). At 7 days after surgery, the scores were 0.3 ± 0.5 in the TEP group and 0.4 ± 0.8 in the Lichtenstein group (0.137). The mean number of injection of Diclofenac Sodium required by the TEP and Lichtenstein groups was 3.1 ± 1.6 and 5.8 ± 2.2, respectively (p = 0.011).

Conclusion: Less postoperative pain and requirement for analgesics were reported by patients who underwent total extraperitoneal laparoscopic repair of inguinal hernia as compared to those who underwent inguinal hernia repair by Lichtenstein tension free mesh hernioplasty.

Keywords: Hernioplasty, Laparoscopy, Lichtenstein repair, TEP, Total extraperitoneal.

INTRODUCTION

Inguinal hernia is one of the most common surgical problems seen in the general surgical practice. Despite the existence of many well established traditional methods of hernia repair, results have been variable with recurrence rates. These unsatisfactory results have led surgeons to develop and seek new methods of hernia repair. Today, the tension-free hernioplasty is one of the most successful variations of hernia repair[1].

Recently, with the introduction of minimal access techniques and the subsequent success of laparoscopic cholecystectomy, surgeons have investigated the possibility of repairing inguinal hernia using such an approach. There are two main approaches for the laparoscopic repair of inguinal hernias. Transabdominal preperitoneal repair involves access to the hernia through the peritoneal cavity. In the TEP repair, the hernia site is accessed via the preperitoneal plane without entering the peritoneal cavity. It is associated with less postoperative pain, a shorter period of sick leave and a faster recovery, compared with open Lichtenstein hernia repair[3]. It is an accepted technique for the repair of recurrent and bilateral inguinal hernia[4]. Long-term results demonstrate it to be an effective and safe procedure with a low recurrence and low prevalence of chronic pain that is generally of a mild, infrequent nature[5]. The sheer number of patients presenting with inguinal hernias to the local surgical practices in Pakistan indicates the need to explore new and improved surgical options for the repair of inguinal hernias. As there is paucity of data from the local settings on

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newer techniques of hernia repair, especially laparoscopic techniques, therefore, the present study was planned to fill this void in information.

Aiming to compare the short term complication of hernia repair, this study was designed to evaluate post-operative pain in patients with primary, unilateral inguinal hernia undergoing laparoscopic and open repair. The results of this study can have the potential for significant influence on the present preferences of hernia repair in the local settings.

PATIENTS AND METHODS

This quasi experimental study was conducted at the surgical unit 1 RMC & Allied hospitals for a period of six months from January to June 2012. In this study 60 patients, 30 from the Lichtenstein open repair and 30 from TEP laparoscopic inguinal hernia repair group were evaluated on the basis of non-probably purposive sampling. Men aged 20 to 70 years with reducible inguinal hernia on clinical examination were the inclusion criteria. Patients with recurrent inguinal hernia, bilateral inguinal hernia and previous lower abdominal surgery were excluded from the study. The purpose, procedure and risk/benefit of the study were explained to all the patients fulfilling the selection criteria and they were offered enrollment into the study with informed consent. All enrolled patients were admitted from surgical OPD and were subjected to history, clinical examination and routine laboratory investigations, preoperatively. Patients were divided randomly to the TEP group and the Lichtenstein hernia repair group. All operative procedures were performed on the next available elective surgical list by consultant surgeons experienced in performing hernia repairs. All intraoperative complications were noted. In postoperative period, an injection of Diclofenac Sodium 75 mg intramuscular was given on as-and-when-required basis. If relief of pain was not experienced, an injection of Tramadol intravenous was given. A record of analgesic required (type and frequency) was kept. The patients were discharged when there was no requirement of injectable analgesics in last 12 hours. Post operative pain was recorded using the visual analogue scale at 12 and 24 hours following surgery. The duration of hospital stay was noted. The patients were called for follow up after 2 days, 7 days and 14 days of discharge. During these visits pain score was noted by visual analogue score. The data from the patient was collected on a specially designed proforma. SPSS software was used for data analysis. All the data was tabulated and analyzed. Postoperative pain score were expressed as mean ± standard deviation. To test for the differences in the mean values between the two groups the student's t-test was used. A probability level of 0.05 was considered significant.

RESULTS

All 60 patients underwent surgery according to their allocated protocol. Patients in groups, the TEP laparoscopic hernia repair and the Lichtenstein tension free mesh hernioplasty were similar in age. The baseline comparison of TEP and Lichtenstein repair groups is shown in table-1. There was one conversion to open repair in a patient in the laparoscopy group who sustained an iatrogenic vascular injury. The femoral artery was damaged near its origin, and the procedure was converted to open repair and through that approach, satisfactory hemostasis was achieved. That patient was included in the Lichtenstein tension free mesh repair protocol for pain score evaluation. There was one case of testicular hematoma formation in a patient who underwent open hernia repair by Lichtenstein tension free method.

At 12 hours following surgery, the mean groin region pain scores on the visual analogue scale were 3.1 ± 1.8 for the group which underwent TEP hernia repair and 4.2 ± 2.1 for the group which underwent Lichtenstein tension-free mesh hernioplasty. The independent samples t-test revealed that the difference was statistically significant (p 0.031). At 24 hours following surgery, the mean pain scores on the visual analogue scale were 2.3 ± 1.5 for the group which

underwent TEP hernia repair and 3.1 ± 1.9 for the group which underwent Lichtenstein tension-free mesh hernioplasty. The difference was statistically significant (p = 0.026). Twenty nime patients (96.6%) from the TEP hernia repair group and all the patients (100%) from the Lichtenstein hernia repair were available at 2 days (48 hours) of follow up. In the TEP group, the mean pain scores on the visual analogue scale were 1.5 ± 1.1 while in the Lichtenstein group they were 2.0 ± 1.6. The difference was statistically significant (p = 0.041). Twenty eight patients (93.3%) who underwent TEP hernia repair and 29 patients (96.6%) who underwent the Lichtenstein hernia repair came for follow up visit at 7 days following surgery, as instructed. In those patients, the mean groin region pain scores at that point were 0.3 ± 0.5 in the TEP group and 0.4 ± 0.8 in the group that underwent Lichtenstein hernia repair. The difference was not statistically significant (p = 0.137). Twenty six patients (86.6%) from the TEP hernia repair group and 27 patients (90%) from the Lichtenstein hernia repair were available at 14 days of follow up. In the TEP group, the mean pain scores on the visual analogue scale were 0.2 ± 0.3 while in the Lichtenstein group they were 0.3 ± 0.1. The difference was not statistically significant (p = 0.771).

Fig-1 presents a graphical comparison of the mean number of injections required (p = 0.011). In the group which underwent totally extraperitoneal laparoscopic hernia repair, the mean duration of hospital stay was 1.5 ± 0.6 days (range 0.8-3 days) while the mean duration of stay in the group which underwent Lichtenstein repair was 1.6 ± 0.7 days (range 0.7 – 2.5 days). The difference was not statistically significant (p = 0.266).

Table-1: Baseline comparison of TEP and lichtenstein groups.

	TEP laparoscopic hernia repair group (n=30)	Lichtenstein hernia repair group (n=30)	*p*-value
Age, years (mean ± SD)	35.00 ± 15.13	41.64 ± 17.00	0.116
Gender			
Male	30 (100%)	30 (100%)	
Females	0 (0%)	0 (0%)	
Laterality of hernia			
Right	18 (60%)	18 (60%)	1.000
Left	12 (40%)	12 (40%)	

DISCUSSION

The present, quasi-experimental study, comparing postoperative pain in patients who underwent repair of inguinal hernia using the TEP laparoscopic hernia repair technique, with patients who underwent inguinal hernia repair with the Lichtenstein tension free mesh hernioplasty, found that the patients in the TEP group reported significantly less post-operative pain and consumed fewer analgesics in the early post operative period, as compared to the patients who underwent Lichtenstein mesh hernioplasty. The comparison of laparoscopic and open techniques for the repair of inguinal hernias has been a recent focus of attention in international publications[6]. A number of studies have noted that pain scores are lower in patients who undergo laparoscopic hernia repair as compared to those who are treated with open repair[2,7-15]. The sole study from Pakistan on the comparison of TEP laparoscopic and Lichtenstein hernia repair, carried out by Moeen et al at Lahore[16] also found that post operative morbidity was much less in patients who underwent laparoscopic repair. In conformation with the published literature, the present study found that the mean post operative groin pain scores on visual analogue scale were significantly lower in patients who underwent TEP hernia

repair, as compared with those patients who underwent Lichtenstein tension-free mesh hernioplasty. We found that at 12 hours after surgery, the mean pain scores in the TEP and Lichtenstein group were 3.1 ± 1.8 and 4.2 ± 2.1, respectively. These findings are also comparable to the findings of Lal et al[17] who noted that the mean scores in patients who underwent TEP were 2.64 ± 1.4 while scores for patients who underwent Lichtenstein repair were 3.52 ± 1.7.

At 24 hours, patients in the present study reported mean pain scores as 2.3 ± 1.5 for the group which underwent TEP hernia repair and 3.1 ± 1.9 for patients who underwent Lichtenstein repair. In the study by Lal et al[17] the mean pain scores were 1.76 ± 1.4 and 2.74 ± 1.5 for the TEP and the Lichtenstein groups respectively. At 2 days post-surgery, patients in the present study reported mean pain scores of 1.5 ± 1.1 in the TEP group while in the Lichtenstein group the mean scores were 2.0 ± 1.6. In the study by Lal et al[17] at 48 hours following surgery, the mean pain scores were 1.4 ± 1.5 and 1.8 ± 1.0 for the TEP and the Lichtenstein groups. On the 7th day, the patients in the following study reported mean pain scores of 0.3 ± 0.5 in the TEP group and 0.4 ± 0.8 in the Lichtenstein group while in the study by Lal et al[17] mean scores of 0.4 ± 0.8 and 0.6 ± 1 in the TEP and Lichtenstein groups, respectively.

There are two notable points in the comparison of the pain scores between the present study and that of Lal et al[17] that probably require elaboration. Firstly, the comparison of scores between the two groups is similar, that is, at[12, 24,48] hours and at 7 days of follow up, the patients in the TEP group reported significantly less post-operative pain as compared to the patients who underwent Lichtenstein tension free mesh hernioplasty. The distribution of the difference is quite similar, with statistically significant differences seen at 12,24 and 48 hours but at 7 days there was a small difference, which was not statistically significant. The larger size of the incision and the greater local disruption of the tissues in Lichtenstein hernia repair probably accounts for the higher mean pain scores seen in patients who underwent Lichtenstein repair. 'Minimal access surgery', such as laparoscopy, is

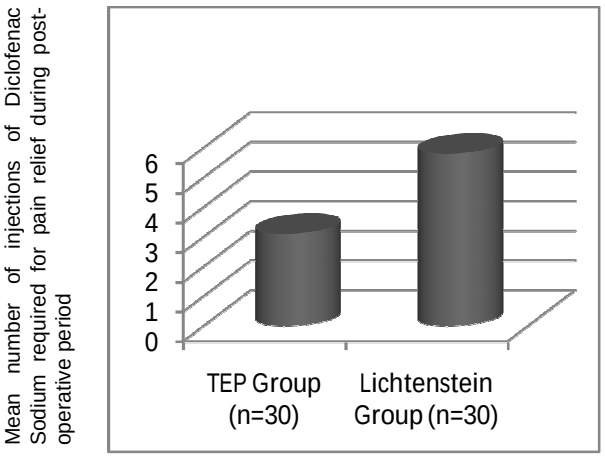

Figure-1: Bar chart showing comparison of the number of injections of diclofenac sodium by each group of patients.

given this nomenclature because it requires limited access to the surgical site and hence, lesser disruption of local tissues and thus causes lesser post-operative pain, seroma and hematoma formation and scarring. The second notable difference between the findings of the present study and that of Lal et al[17] is that the mean pain scores in the present study at 12, 24 and 48 hours are higher than those observed by Lal et al. A possible explanation of this may lie in the fact that pain is a highly subjective sensation. Pain thresholds differ among individuals and it maybe that some of the individuals in the present study had low pain thresholds and reported higher pain scores on the visual analogue scale. The visual analogue scale itself has recently been the subject of considerable discussion because there are known difficulties in its administration and interpretation of the scores. Even though it is apparently simple, the administration usually requires considerable explanation to the patient on how it is used[18]. This may be a possible cause for the difference in the pain scores seen between the present study and the study by Lal and coworkers[17]. The pattern of difference between the utilization of pain killers was similar between Lal et al and the present study. However a direct comparison is not possible because the protocol

of the present study entailed the use of intramuscular injections of 75 mg Diclofenac Sodium while that of Lal et al mentioned the use of oral tablets of Diclofenac Sodium, of 50 mg quantity. The difference in route of administration of the drug in the two studies precludes a comparison of the number of doses required but in both of the studies; the TEP group required significantly less number of doses of analgesic. Although the protocol of the present study mentioned that in case the patient's pain was not relieved with Diclofenac Sodium, a non-steroidal anti-inflammatory drug and a potent pain killer, injectable Tramadol, an atypical opioid which is a centrally acting analgesic, would be given as an intravenous injection[19]. None of the patients in either of the two groups required a switch from Diclofenac to Tramadol, indicating that the severity of pain after neither TEP nor Lichtenstein hernia repair was enough to require an opioid analgesic.

The present study had one conversion of laparoscopic to an open repair. This was necessitated by an iatrogenic injury to the femoral artery near its origin, in one patient in the course of laparoscopic repair. It was a non-trocar injury to the artery and the troublesome bleeding was not controlled by laparoscopic measures for hemostasis so an open repair of both the injury to the femoral artery and the hernia was done through a conventional groin incision and a mesh repair of the hernia. Vascular injury, although rare, is a well known complication of laparoscopic hernia repair[6]. As our surgeons gain further experience in laparoscopic hernia repair, it is hoped that such injuries and the subsequent conversions will be seen very infrequently in the local settings as well, similar to Western surgical centers where such injuries are rarely seen[7-9]. There was just one other complication, that of a scrotal hematoma formation in a patient who underwent open repair. The frequency of such an injury in the present study is much less as compared to that reported in published literature which ranges from 10-55% in patients undergoing Lichtenstein repair of inguinal hernia[8,9]. The duration of hospital stay in the present study was not much different between the two protocols. Although patients undergoing Lichtenstein hernia repair ambulated earlier, all patients who were subjected to laparoscopy underwent the procedure in general anesthesia, so the recovery period after anesthesia also added to the duration of stay even though the patients had lower pain scores. The findings of this study have several important implications for clinical practice. We compared a relatively new technique for doing inguinal hernia repair with a technique which for years, has been used as a benchmark for open hernia repairs, the Lichtenstein tension-free mesh hernioplasty[20]. All laparoscopic techniques have a definite learning curve for each procedure which is usually longer than its open counterpart. This fact, allied with the well known safety, low morbidity and minimal recurrence in Lichtenstein hernia repair require that significant advantages of laparoscopy should be shown through research before this alternative can replace open repair of inguinal hernia in Pakistani settings. The findings of the present study can play a major role in tilting the balance in favor of laparoscopic hernia repair, as they show that post-operative pain is much less in patients who undergo TEP hernia repair with laparoscopy as compared to Lichtenstein repair. However, to strengthen the case of laparoscopic hernia repair replacing open repair, further research in the form of large, multicentre studies comparing laparoscopic and open repair on variables such as operative duration, intra-operative complications, early and late post operative complications and recurrence of inguinal hernia, needs to be carried out.

The shortcomings of this work are also related to the other potentially important variables such as operative duration, return to work and recurrence, which the present study did not evaluate, but must be noted in future efforts on this topic.

It is hoped that this study will be the forbearer of further studies comparing laparoscopic and open inguinal hernia repair,

ultimately deciding conclusively which ever intervention is the most useful for the patients who will be the ultimate beneficiaries of the research.

CONCLUSION

Less postoperative pain and requirement for analgesics was reported by patients who underwent totally extraperitoneal laparoscopic repair of inguinal hernia as compared to those who underwent inguinal hernia repair by Lichtenstein tension free mesh hernioplasty. There is a need for further research for drawing comparisons between laparoscopic and open techniques of inguinal hernia repair so that definite conclusions can be drawn as to which technique is superior for the management of inguinal hernias.

Conflict of Interest

This study has no conflict of interest to declare by any author.

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