ORIGINAL ARTICLE

Eastern Journal of Medicine
East J Med 29(2): 175-180, 2024
DOI: 10.5505/ejm.2024.52128

Comparison of the Results of Lichtenstein Method and Laparoscopic Total Extraperitoneal Method in Inguinal Hernia Repair

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ABSTRACT

This study aimed to compare the results of open Lichtenstein repair (OLR) and laparoscopic total extraperitoneal (TEP) repair methods in inguinal hernia (IH).

Between January 2017 and December 2018, 201 patients who underwent TEP and OLR methods for IH in our hospital were retrospectively analyzed. TEP was performed in 98 of these patients and OLR was performed in 103 patients. The patients were evaluated in terms of age, gender, hernia type, operation time, early and late postoperative complications, length of hospital stay and accompanying diseases.

One hundred forty-five (72.5%) of 201 patients had right IH and 56 (27.5%) had left IH. TEP group and OLR group were similar in terms of age, gender, hernia type and comorbidity. Our mean follow-up period was 24(18-36) months. The average operation time was 61.2 (40-80) minutes in TEP and 55.4 (45-70) minutes in the OLR group; It was significantly longer in the TEP group ($P<0.05$). Postoperative early complications were 7 (7.1%) in TEP and 10 (9.8%) in OLR, the difference was not significant. Postoperative recurrence was detected in 2(2.04%) cases in TEP and in 2(1.94%) cases in OLR, and no significant difference was found. The length of hospitalstay is equal in both groups.

In our study, although the operative time was longer in the TEP group than in the OLR, no difference was observed between the length of hospital stay, postoperative complications and recurrence rates. We believe that TEP method will be applied in a shorter time as experience and experience increase.

Keywords: Inguinal hernia, laparoscopic Total Extra-Peritoneal herniorrhaphy, open Lichtenstein repair.

Introduction

Inguinal hernia (IH) repair is one of the most widely performed surgical procedures worldwide (1). Regardless of the hernia type, the definitive treatment of IH is surgery (2). The first hernia terminology was defined in Erb's papyrus in 1552 BC (3). Since then, many techniques for IH repair have been described and many modifications have been applied to these techniques. The results of IH repair have gotten progressively better since the tension-free herniorrhaphy was performed. (4). After the invention of biocompatible synthetic meshes, new techniques were developed, such as the Lichtenstein tension-free hernioplasty with low recurrence rates and high postoperative quality of life. The most common used technique is Open Lichtenstein repair (OLR). European Hernia Society guidelines reported that the recurrence rate of OLR in specialized centers is less than 1% (5). With the development of laparoscopy in the field of general surgery, it has also started to be used in hernia repair. Both Trans-Abdominal Pre-Peritoneal (TAPP) and Total Extra-Peritoneal (TEP) herniorrhaphy were started to be performed laparoscopically. There is a learning curve for TEP to gain experience. Therefore, early studies have caused controversy (6). Today, the development of laparoscopic technique, devices and prosthetic materials has enabled the TEP technique to have better results.

The main problems of IH repair are postoperative pain, time to return to work, recurrences and chronic pain (7). In the literature, it is stated that laparoscopic technique is promising in the terms of early postoperative results (8). However, randomized controlled studies with longer follow-up periods are needed to make a decision.

The aim of this study is that the OLR and TEP procedures we currently apply; To evaluate the results in terms of operative complications, return

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Received: 04.06.2023, **Accepted:** 21.11.2023

to work, recurrence and chronic pain in the light of the literature.

Materials and Method

Between January 2017 and December 2018, 201 patients who were operated for IH with TEP and OLR methods in our hospital were retrospectively analyzed. Our study was approved by the ethics committee of our hospital.(Decision:2020/514/182/19. Date:22/07/2020)

TEP repair was performed in 98 of these patients and OLR was performed in 103 patients. All surgeries were performed under the supervision of the general surgeons of our clinic. OLR patients were operated under spinal anesthesia and TEP surgery was performed under general anesthesia with the classical 3 trocar technique and under 12-14 mmHg pressure. Demographic characteristics of the patients, hernia type, duration of operation, painless mobilization, early and late postoperative complications (infection, edema, seroma, neuroma, testicular atrophy, recurrence), length of hospital stay, accompanying diseases (chronic obstructive pulmonary diseases, constipation, prostate hypertrophy, diabetes) were evaluated in terms of hypertension. Patients with bilateral inguinal herniorrhaphy, those under 18 years of age, recurrent hernias, scrotal hernias, patients who could not be reached during control and ASA (American Society of Anesthesiologists) 4 patients were not included in the study.

Statistical Analysis: Statistical Package for Social Sciences (SPSS) for Windows 17.0 program was used for all statistical analyzes in the study. While evaluating the study data, Student's t-test was used for the comparison of normally distributed parameters in comparison of quantitative data as well as descriptive statistical methods (mean, standard deviation, frequency). Chi-square test and Fisher's exact chi-square test were used to compare qualitative data. The results were evaluated at the 95% confidence interval, and the significance was at the $p<0.05$ level.

Results

One hundred eighty-six (92.5%) of the 201 patients who were operated on, were male and 15 (7.5%) were female. There was right IH in 145 (72.5%) cases and left IH in 56 (27.5%) cases. The youngest patient was 18, the oldest was 79, and the mean age was 47±4.0 years. When the TEP and OLR repair groups were compared in terms of age, gender, hernia type, and comorbidity, the data of both groups were similar. As the hernia type of the 201 patient; In 55 (27.3%) direct, 134 (66.7%) indirect, and 12 (6%) cases, both direct and indirect (combined) hernias were detected. (Table 1). The shortest 40 minutes, the longest 80 minutes mean 61.2±15 minutes in TEP, the shortest 45 minutes and the longest 70 minutes, mean 55.3±12 minutes in the OLR group; It was significantly longer in the TEP group ($P<0.05$). (Table 2).

Our mean follow-up period was 24(18-36) months. Postoperative early complications (seroma-edema, hematoma and infection) were in 7 (7.1%) cases in TEP and 10 (9.8%) in OLR, the difference was not significant. Postoperative recurrence was detected in 2 cases (2.04%) in TEP and in 2 (1.94%) cases in OLR and it was not found significant. All operated patients were discharged on the first postoperative day. The length of hospital stay was equal between the two groups. (Table 2). Postoperative pain and early mobilization in the study; Since they were under general anesthesia in the TEP group and spinal anesthesia in the OLR group, no comparison was made.

Discussion

The frequent recurrences and testicular complications in classical anterior IH repairs have led surgeons to find different methods. Suture-based repair methods such as Bassini, Shouldice, Halsted, McVay are now subordinated to methods using prosthetic mesh, such as Lichtenstein, Plug Mesh and Laparoscopic hernia repair. There is a recent consensus on a tension-free approach for inguinal hernioplasty due to lower recurrence rates and better postoperative quality of life (3).

Lichtenstein's tension-free hernioplasty (anterior prosthetic hernioplasty), Stoppa's wide prosthesis reinforcement and even today's laparoscopic hernia repairs; showed that the efforts for the surgical treatment of hernias are not over yet. For this, the idea of obtaining the best method in IH repair was formed, but there is still no standard method.

Under normal conditions, the testicles descend from the inguinal canal to the scrotum after birth and the canal is closed. In cases where it is not closed or weak, a hernia may occur. Therefore, IH is more common in men (9-10). Because the posterior wall is stronger in women (10). Of the total 201 patients, 186 (92.5%) were male and 15

Table 1. Demographic and Clinico-pathological Features of The Patients

FEATURES	RESULTS	%	TOTAL (n)
GENDER (n)			201
Male	186	92,5	
Female	15	7,5	
AGE (year)			
Median	46 +/- 2,5		
Interval	18-79		
SIDE OF HERNİA (n)			201
Rigth	145	72,5	
Left	56	27,5	
SURGERY (n)			201
TEP	98	48,7	
OLR	103	51,3	
FOLLOW OP TIME (month)			
Median	24,40+/-10		
Interval	18-36		
HERNİA TYPE (n)			201
Direct	55	27,3	
Indirect	134	66,7	
Combined (pantaloon)	12	6,0	

TEP: Laparoscopic totally extraperitoneal herniorrhaphy, OLR: open Lichtenstein repair, n:number

(7.5%) were female.In our study, male cases were also high.

The direct effect of cardiac, pulmonary and prostate problems on recurrence has not been determined (10). In our study, we did not observe the direct effect of patients with cardiac, pulmonary, prostate and diabetic problems on recurrence and postoperative complications, since they were operated on by stabilizing them preoperatively.

When the operation time was compared in TEP and OLR groups; different results come out. In our study, the operation time was shorter in the OLR group compared to the TEP group. Studies comparing operative time between TEP and OLR have generally shown that the operative time is shorter in OLR. Dhankhar et al. stated that the operation time was 11 minutes shorter in the OLR compared to the TEP group (11). Sun et al. stated in their meta-analysis that the operation time is shorter in OLR than in TEP (12). However, with experience in advanced laparoscopic surgery and inguinal anatomy, the operation time can be significantly reduced. Contrary to previous studies, there are also studies with shorter operative time in the TEP group than in the OLR group. Fernando et al. found that the mean TEP operation time was shorter than OLR operation time (13). In our study, all operations were performed by experienced laparoscopic surgeons and operation time in TEP group was no superior to open surgery group.

When comparing the two groups in terms of postoperative pain and early mobilization, generally less pain and early mobilization are noted in the TEP group compared to the OLR group. Both in the meta-analysis of Sun et al.and the study of Fernando et al. stated that postoperative pain was significant in the TEP group compared to the OLR group (12,13). Since TEP was performed under general anesthesia and OLR was performed under spinal anesthesia in our study, we believe that it would not be appropriate to compare them in terms of postoperative pain and mobilization.

In the meta-analysis of Schmedt et al., in patients who underwent TEP; they reported less wound infection, less hematoma, less nerve lesions and less chronic pain, and an earlier return to normal activity. In addition, patients who underwent OLR reported shorter operation time, fewer seromas, and fewer recurrences (14). In the comparative study of Ozgur et al. in IH repair; stated that both open and laparoscopic hernia repair can be performed safely with a low complication rate (15). In our study, the TEP and OLR groups were

Table 2. Distribution of Length of HospitalStay, Operation Time, Return toWork, Complication and Recuurrence

	TEP	OLR	P value*
PATIENT NUMBER	98	103	
OPERATİNG TİME (mn)	61.2 ± 15	55.3 ± 12	P<0.05
EARLY COMPLICATION	7(%7,1)	10(%9,7)	P=ns
Edema-seroma	5	6	
Infection	-	2	
Hematom	2	2	
Neuralgia, Testicularpain, Urinaryretention	-	-	
RECURRENS	2(%2.01)	2(%1,95)	P=ns
LENGT OF HOSPITAL (day)	1	1	P=ns
RETURN TO WORK (day)	8.67 ± 2.47	9.17 ± 2.4	P=ns

*Student's t-test. TEP: Laparoscopic totally extraperitoneal herniorrhaphy. OLR: open Lichtenstein repair, ns: not significant, mn: minute

compared in terms of early postoperative complications such as hematoma, seroma and surgical site infections, and there was no statistically significant difference between the two groups.

Bobo et al., in their meta-analysis study, reported a shorter operation time in patients who underwent OLR, like our study; however, they stated that it provides a shorter time to return to work and less chronic pain in patients who underwent TEP (16). In our study, all patients were discharged on the 1st postoperative day, and there was no significant difference between the two groups in terms of time to return to work.

When the literature is examined in terms of follow-up periods; It is possible to find different follow-up times and different recurrence data. When the recurrences were compared in the follow-ups within the first 3 years after the surgery; there is no significant difference like our study. In contrast, when follow-up was longer than 3 years, the TEP group had a higher recurrence rate compared to Lichtenstein repairs (16). Since the mean follow-up period was 24 months in our study, it is not possible to compare long-term results.

Postoperative hospital stay was equal in both groups and all patients were discharged on the 1st postoperative day. Although we did not conduct a study in terms of cost, Mangalli et al. reported that the cost of TEP was significantly higher when they compared the TEP with the Lichtestein method (17). However, in the study of Westin et al. reported that they did not find any difference between TEP and OLR in terms of cost (18).

Perhaps the most important clinical study on hernia is to evaluate it in terms of recurrence. It is affected by technical errors such as improper fixation, lack of dissection or inadequate repair of hernia defect (19). Therefore, avoiding recurrences becomes the primary concern of hernia repair. On the other hand, Bobo et al. stated that if the follow-up period is less than 3 years, there was no difference between the recurrence rates (16). They suggest that the recurrence rate of the TEP group was higher with a longer follow-up period. Similarly, Koning et al. reported that recurrence was higher in the TEP group (7). Even though the mean follow-up period of our study was short in terms of relapse, Sevinç et al. reported that the mean relapse time to be 17 months and there was no recurrence after 28 months in their study (20). Fernando et al. reported the recurrence rate as 2.8% in TEP (13),]and Sun et al. reported that the Lichtestein method had a lower recurrence rate than the TEP method, although it was not significant (12). Memon et al. pointed out the increasing tendency of recurrence after TEP (21). Moreover, a meta-analysis showed that the recurrence rate of laparoscopic IH repair (both TEP and TAPP) is higher than open repair (14). In our study, we observed a recurrence rate of 2.01% in the TEP group and 1.95% in the OLR group, with an average follow-up period of 24 months. There was no significant difference between the two groups in terms of recurrence. As we gain more experience in laparoscopic surgery, the recurrence rates of the TEP method can be further reduced.

Although there is conclusive evidence of longer operative time and learning curve, Sahh et al.

reported that TEP has advantages such as less postoperative pain, early initiation of normal activities, less chronic inguinal pain, and a comparable recurrence rate compared to OLR (22). TEP can be performed by experienced hands with acceptable recurrences and fewer postoperative complications. The comparative study of TEP and OLR by Haque et al. was associated with less postoperative pain, fewer postoperative complications, shorter hospital stay, and earlier return to normal activities and faster recovery in the TEP group (23). However, in our study, the duration of surgery was found to be long only in the TEP group.

As a conclusion, there is no significant difference between the postoperative results of inguial hernia repair methods applied today. In our study, only the operation time was found to be significantly longer in the TEP method. We believe that TEP method will be applied in a shorter time as experience and experience increase. In line with these results of our study, the most appropriate method in the selection of the operation technique in hernia repair can be decided according to the current conditions. In fact, there is a need for prospective and more comprehensive studies in which the repair method is standardized according to the hernia type.

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