Original Article

Comparison of Postoperative Short-term Complications and Recurrence after One Year between Laparoscopic Transabdominal Pre-peritoneal (TAPP) and Lichtenstein Tension Free Repair on the Treatment of Primary Unilateral Inguinal Hernia

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Received: 19/06/2024
Accepted: 7/11/2024

ABSTRACT

Background: Inguinal hernia is one of the most common cases of elective surgery. Several methods are used to repair inguinal hernia, however, none of these methods have been introduced as the preferred method. Based on this, the current study was designed with the aim of comparing the postoperative short-term complications and recurrence after one year between laparoscopic transabdominal pre-peritoneal (TAPP) and Lichtenstein tension free repair in the treatment of primary unilateral inguinal hernia.

Methods: In this clinical trial study, 122 patients who were candidates for inguinal hernia surgery in Ahvaz Golestan Hospital, Ahvaz, Southern Iran in 2022 were randomly assigned to two laparoscopic (TAPP) and open (Lichtenstein) surgery groups. Patients were compared in terms of short-term complications (hematoma, infection, seroma), post-surgery pain and number of hospitalization days, surgery duration, scar length and one-year recurrence rate.

Results: Wound infection, seroma, and hematoma after surgery in the TAPP group were significantly less than the patients in the Lichtenstein group (P=0.002). Pain intensity, recurrence rate and mean length of surgical scar in laparoscopic group patients were lower than open method group (P=0.001). The mean duration of surgery in the laparoscopic group was higher than the Lichtenstein group, but there was no remarkable difference (P=0.396). The mean duration of surgery in the TAPP group was higher than the Lichtenstein group, but there was no notable difference (P=0.396).

Conclusions: The TAPP method has an obvious advantage over the conventional open surgery of Lichtenstein, especially in terms of reducing the initial postoperative pain and the occurrence of complications and recurrence after surgery.

KEYWORDS
Inguinal hernia; Transabdominal pre-peritoneal (TAPP); Lichtenstein Tension-free; Complications

Please cite this paper as:
Ashrafi A. Kabiri A, Shayesteh Zadeh B, Sadri P. Comparison of Postoperative Short-term Complications and Recurrence after One Year between Laparoscopic Transabdominal Pre-peritoneal (TAPP) and Lichtenstein Tension Free Repair on the Treatment of Primary Unilateral Inguinal Hernia. World J Plast Surg. 2024;13(3):87-91.
doi: 10.61186/wjps.13.3.87

[Downloaded from wjps.ir on 2026-10-31]

[DOI: 10.61186/wjps.13.3.87]

INTRODUCTION

Hernia is one of the oldest complaints leading to surgery[1]. A hernia is defined as a protrusion, protrusion or protrusion of an organ or part of an organ through the wall that normally encloses it. Inguinal and femoral hernias are collectively known as inguinal hernias[2].

Hernias are more common in men than in women[3]. Inguinal hernia in male has 2 age peaks: before one-year-old and after 40 years old. History of hernia or previous repair of hernia, old age, male gender, Caucasian race, chronic cough, chronic obstructive pulmonary disease, chronic constipation, abdominal wall damage, smoking and family history of hernia are the most important risk factors for hernia[4, 5].

Definitive treatment of hernias, regardless of its origin and type, is surgical repair[6]. Inguinal hernia repair is one of the most common procedures performed. More than 20 million inguinal or femoral hernias are repaired worldwide each year[7].

There are different techniques for repairing inguinal or femoral hernias. These techniques are divided into open and laparoscopic techniques[8]. Open techniques approach the hernia from an anterior side and include mesh-assisted tension-free repair techniques as well as non-mesh-assisted primary tissue approximation repairs[9-11].

Laparoscopic repairs approach the hernia from a posterior side. The two main techniques in this category are totally extraperitoneal repair (TEP) and transabdominal pre-peritoneal repair (TAPP), both of which require the use of mesh and are tension-free repairs[12-15].

Despite the studies in this field, none of these methods have been introduced as the preferred method. Based on this, the present clinical trial study was designed with the aim of comparing the rate of early complications and recurrence in two methods of TAPP and open tension-free repair (Lichtenstein) in the treatment of inguinal hernia.

MATERIALS AND METHODS

In this clinical trial study, 122 patients who were candidates for inguinal hernia surgery in Ahvaz Golestan Hospital, Ahvaz, Southern Iran in 2022 were randomly assigned to two laparoscopic (TAPP) and open (Lichtenstein) surgery groups. Inclusion criteria were adults over 18 years of age with primary unilateral inguinal hernia. Patients with bilateral, complex hernias, hernias with hydrocele or varicocele, and patients with recurrent hernias were excluded.

Demographic information, medical history, medications, and physical examination of 122 patients were recorded by the surgeon in the questionnaire. Eligible patients were divided into two groups. Group A patients who underwent laparoscopic repair, group B patients who underwent open hernia repair. For open repair, Lichtenstein tension-free repair was performed under spinal anesthesia. Laparoscopic repair was performed with the TAPP mesh repair method under general anesthesia. Postoperative complications, postoperative pain, recurrence, and length of hospital stay were collected for each patient. A visual analog scale (VAS), which is a subjective measure to evaluate pain in patients, was used. This criterion is classified from 0-10 and 0 indicates no pain and 10 indicates the most pain.

The protocol of the study was approved by the ethics committee of Ahvaz Jundishapur University of Medical Sciences with the ethics code of IR.AJUMS.HGOLESTAN.REC.1401.019.

Statistical analysis

Statistical analysis was performed by SPSS software version 22 (IBM Corp., Armonk, NY, USA). The quantitative and qualitative variables were indicated as mean±SD and number (percentage), respectively. Kolmogorov–Smirnov and Shapiro–Wilk tests were used to test for the distribution. Chi-square tests, *t*-test, ANOVA and Pearson's correlation coefficient tests were used to analyze the data. P-value less than 0.05 was considered statistically significant.

RESULTS

The mean age of patients in the laparoscopic and open method groups was 43.79±14.04 and 47.07±15.79, respectively, and no significant difference was observed (P=0.137). There was no significant difference in gender between the two groups (P=0.201). Right side involvement in the laparoscopy and open method groups were 28.7% and 27%, respectively, and no remarkable difference was observed between the two groups(P=0.866). Moreover, occupation and history of smoking were not statistically different between the two groups.

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[DOI: 10.61186/wjps.13.3.87]

Table 1 shows the demographic characteristics of the studied patients.

The operation site hematoma was 0.8% and 3.3 % in the laparoscopic and open method groups, respectively. Seroma in the open method was significantly more than laparoscopy group (*P*=0.04). Moreover, wound infection in the open method was significantly more than laparoscopy group (*P*=0.04). Total complications in the laparoscopy group and open method group were 9% and 0.8%, respectively (*P*=0.002) (Table 2).

The level of pain in patients at both times in patients undergoing TAPP laparoscopic surgery was significantly lower than in the open Lichtenstein group (*P*=0.201). The recurrence rate in the patients of the laparoscopic group was lower than the open method group (*P*=0.001). Hospitalization days in the laparoscopic and open groups were 1.95 ± 0.93 and 2.33 ± 1.06 days, respectively (*P*=0.168). There was no considerable difference in the duration of surgery between the two groups (*P*=0.396). Surgical scar rate in the laparoscopy group and open method group were 3.51 ± 0.29 and 8.40±1.78, respectively (*P*=0.001). More details are provided in Table 3.

DISCUSSION

The purpose of this clinical trial study was to compare the rate of early complications and recurrence in inguinal hernia surgery by laparoscopic (TAPP) and open (Lichtenstein) methods.

Several methods have been devised for the repair

Table 1: Demographic characteristics of the studied patients

Variable		Type of group		*P*-value
		laparoscopy	open method	
Age (year)		43.79±14.04	47.07±15.79	0.137
Sex, n (%)	**Female**	12 (9.8)	6 (4.9)	0.201
	Male	49 (40.2)	55 (45.1)	
Smoking, n (%)		17 (13.9)	24 (19.7)	0.250
Involved side, n (%)	**Right**	35 (28.7)	33 (27)	0.855
	Left	26 (21.3)	28 (23)	
Job, n (%)	**Freelance**	27 (22.1)	32 (26.2)	0.186
	Governmental	22 (18)	19 (15.6)	
	Retired	6 (4.9)	9 (7.4)	
	Housewife	6 (4.9)	1 (0.8)	

Table 2: Rate of complications after surgery in the both groups

Variable	Type of group		*P*-value
	Laparoscopy	open method	
Operation site hematoma (n, %)	1 (0.8)	4 (3.3)	0.171
Seroma (n,%)	0 (0)	4 (3.30	0.04
Wound infection (n, %)	0 (0)	3 (2.5)	0.04
Total complications (n, %)	1 (0.8)	11 (9)	0.002

Table 3: Clinical features after the surgery in the both groups

Variable		Type of group		*P*-value
		laparoscopy	open method	
VAS	**One month later**	4.80 ± 1.33	7.52 ± 1.71	0.201
	Six month later	1.64 ± 0.68	2.59 ± 1.07	
Recurrence of hernia, n(%)		0 (0)	11 (9)	0.001
Duration of hospitalization, days		1.95 ± 0.93	2.33 ± 1.06	0.168
Duration of surgery, minute		97.05 ± 23.56	68.85 ± 21.02	0.396
Surgical scar rate		3.51 ± 0.29	8.40±1.78	0.001

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[DOI: 10.61186/wjps.13.3.87]

of inguinal hernias, however, the selection of the appropriate method should be based on the level of complications of each method and recurrence after surgery, as well as the experience and familiarity of the surgeon with different methods of hernia repair. A total of 122 patients, of which 61 patients underwent TAPP laparoscopic hernia repair and the rest underwent Lichtenstein open hernia repair. Statistically, there was no significant difference in age or gender in the studied population.

In our study, the operation time of open Lichtenstein method was significantly shorter compared to TAPP laparoscopic repair. This may be because it takes longer to set up laparoscopic equipment compared to open surgery. In a similar study, Scheuerman et al. stated in their meta-analysis results that the operation time in laparoscopic TAPP is longer compared to open surgery[16]. Also, the results of Simons et al.'s study showed that the average operation time in TAPP is relatively higher than the open method[17].

In the present study, the rate of complications, postoperative pain intensity, recurrence after surgery, length of hospital stay, and return to work time were significantly lower in TAPP laparoscopy. Patients who underwent laparoscopic surgery in our study returned to normal activity earlier and worked faster compared to the open group, which was similar to the findings of Neumayer et al[18].

Patients undergoing laparoscopic surgery experienced less postoperative pain compared to patients with open surgery[19], which was consistent with our findings. Because laparoscopic surgery patients had less postoperative pain, this allowed them to ambulate earlier and lead to earlier hospital discharge compared to the open group.

The scar length among patients undergoing laparoscopic surgery in the present study was significantly less than the open surgery group. In most of the studies[19,20], the level of pain after inguinal hernia surgery in laparoscopic patients is reported to be lower than that of open surgery. The cause of less pain can be attributed to the less invasive method in laparoscopic surgery and the fewer and shorter incisions for patients compared to open surgery.

In our study, short-term complications such as infection, hematoma and seroma were more in the open surgery group. In the study by Kargar et al, the patients had no significant differences in terms of early complications such as hematoma, seroma, and infection[21]. The findings of this study were contradictory to our results. The difference in sample size may be the cause of this discrepancy.

In the present study, the recurrence rate was 0% in laparoscopic patients and 9% in open surgery patients, and a significant difference was observed. In line with our results, Wijerathne et al. observed no long-term complications or recurrence in their 11-month follow-up after laparoscopic inguinal hernia repair[22].

CONCLUSION

TAPP laparoscopic surgery has a longer operating time compared to open Lichtenstein surgery, but in terms of other parameters such as postoperative pain, length of hospital stay, scar length after surgery, return to normal activity and work, and complications after surgery (seroma, hematoma, surgical wound infection) laparoscopic group was superior. Further multicenter studies with higher sample size are suggested to confirm these results.

CONFLICT OF INTERESTS

There are no conflicts of interests.

FUNDING

No funding.

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[DOI: 10.61186/wjps.13.3.87]

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