SPER Publications and Solutions Pvt. Ltd.

Original Article

Comparison of peritoneum closure with suturing or tacker or using dual mesh without peritoneal closure in laparoscopic inguinal hernia repair

Mostafa Hoseini, Seyed Hamzeh Mousavie, Behnood Farazmand, Ebadollah Jodai, Alireza Negahi*

Department of Surgery, Rasool-e Akram Hospital, Iran University of Medical Sciences, Iran.

Correspondence: Alireza Negahi, Iran University of Medical Sciences, Iran, Email: Alirezanegahi2018@gmail.com.

ABSTRACT

Background and Objectives: In laparoscopic inguinal hernia repair, a laparo-scope connected to a special camera enters the body and enables the surgeon to see the herniation and surrounding tissues in a monitor. The purpose of this study was to compare the various methods of parietal peritoneum closure in repairing inguinal hernia with laparoscopic surgery. Materials and Methods: Sixty-six patients who were candidates for laparo-scopic inguinal hernia repair were participated in this study. They were divided into the three groups of peritoneum suturing (22 patients), tacker technique (22 patients), and dual mesh plus non-closure of the peritoneum (22 patients). Pain score at 7 and 30 days after surgery, recurrence after surgery, time to return to daily activities, hospitalization stay, and postoperative complications were evaluated in all the three groups. Data were analyzed using SPSS, version 22. Results: We did not find any significant differences in age, gender, and surgical technique among the three groups (P>0.05). There were no significant differ-ence in pain score and hernia recurrence at 7 and 30 days after hernia surgery among the three groups (P>0.05). Hospital stay after repairing inguinal hernia repair in the tacker method group was significantly longer than that in the su-turing method group (P<0.05), and in suture group, it was significantly more than that in the dual mesh group (P<0.05). There was no significant difference in time to return to daily activity among the three groups (P>0.05). There was no difference in postoperative inguinal hernia complications like seroma, bleed-ing, wound infection, urinary retention, ileus, anatomic damage, chronic ingui-nal pain, and testicular cord damage among the three groups (P>0.05). Conclusion: There was no difference in pain score, hernia recurrence, time of returning to daily activities, and complication rate among the three techniques of peritoneal closure using tacker, peritoneal closure using suture, and non-closure of the peritoneum plus using dual mesh. Therefore, peritoneal closure using suture or tacker could be a good substitute for non-closure of the perito-neum in inguinal hernia repair surgery.

Keywords: Inguinal hernia repair, Laparoscopic, Suture, Tacker, dual mesh

Introduction

Inguinal hernia is a common disease, which constitutes 75% of all kinds of hernias. The prevalence of hernia among the male population is 25 times greater than the female population. Inguinal hernia accounts for about 10% of outpatient workload for general surgeons [1]. Hernia occasionally has complications like strangulation, bowel obstruction, incarceration, and life-threatening problems. The most important and common complication of hernia is incarceration that causes mortality and increases the rate of emergency surgeries. Thus, all kinds of hernias should be repair. Various kinds of open surgical procedures have been introduced to repair the inguinal hernia such as Bassini, Shouldice, Stoppa, McVay, Halsted's, and Lichtenstein procedures [2]. But one of the most novel surgical methods in inguinal hernia repair is laparoscopic hernioplasty that was introduced in 1990 for the first time [3]. The advantages of this method compared to open hernioplasty include better\cosmetic effect, postoperative pain reduction, shorter hospitalization duration, faster returning to daily activities, fewer complications, and lower risk of recurrence after surgery. The most important complications of this surgery are bowel injuries, urinary system damages, and vascular damages that reduce with higher expertise of the surgeon [4].

Access this article online	
Website: www.japer.in	**E-ISSN:** 2249-3379

How to cite this article: Mostafa Hoseini, Seyed Hamzeh Mousavie, Behnood Farazmand, Ebadollah Jodai, Alireza Negahi. Comparison of peritoneum closure with suturing or tacker or us-ing dual mesh without peritoneal closure in laparoscopic inguinal hernia repair. J Adv Pharm Edu Res 2019;9(S2):150-153.
Source of Support: Nil, Conflict of Interest: None declared.

Laparoscopic hernioplasty can be performed in all patients with inguinal hernia who are good candidates for general anesthesia, but the best indications for laparoscopic surgery are hernia recurrence after open approach repair, bilateral inguinal hernia, and other simultaneous laparoscopic procedures like cholecystectomy. Further, absolute contraindications for laparoscopic hernioplasty are any signs of intraabdominal infection, coagulopathy disorders, bowel obstruction, and comorbidity and unable to general of anesthesia. Partial contraindications for laparoscopy include obesity, arrhythmia, aneurysm, pregnancy, peritonitis, intra-abdominal adhesion, incarcerated hernia, and other medical conditions [5].

In laparoscopic inguinal hernia repair, a laparoscope connected to a special camera is inserted into the body through a port site, which enables the surgeon to see the hernia and its surrounding tissues in a monitor. Other ports are inserted to the body to enable the surgeon to operate. Usually, three or four 1-cm port side are needed for this procedure, and the hernia is repaired from the posterior wall of the abdomen [6-10]. In fact, in this procedure, prosthetic materials are inserted from the abdominal wall and through the peritoneal incisions and are fixed at the preperitoneal space. Thus, at the end of the operation, it is needed to close the peritoneal cavity. Sometimes, the operation ends with putting a mesh and leaving the peritoneum open [11, 12]. However, the advantages and limitations of the two mentioned methods remain nebulous, and even the advantages of peritoneal closure techniques are questioned. Herein, we aimed to compare various parietal peritoneal closure techniques in laparoscopic inguinal hernia surgery.

Materials and Methods

This randomized clinical trial was performed on candidates for laparoscopic hernia repair who presented to Rasool Akram Hospital, Tehran, Iran, during 2017-2018. Written informed consent was obtained from all the participants. The patients were divided into three groups of tacker mesh fixation, mesh sutured into the abdominal wall, and dual mesh and non-closure of the peritoneum. Sample size was calculated at 22 per group. Pain was evaluated using the visual analogue scale (VAS) score system on days 0, 7 and 30 post-operation. In addition, 30-day recurrence rate was documented. To analyze the data, Chi square test and *t*-test were run in SPSS, version 22.

Results

We did not find any significant differences in age, gender, and surgical technique among the three groups ($P>0.05$). There were no significant difference in pain score and hernia recurrence at 7 and 30 days after hernia surgery among the three groups ($P>0.05$). Hospital stay after repairing inguinal hernia repair in the tacker method group was significantly longer than that in the suturing method group ($P<0.05$), and in suture group, it was significantly more than that in the dual mesh group ($P<0.05$). There was no significant difference in time to return to daily activity among the three groups ($P>0.05$). There was no difference in postoperative inguinal hernia complications like seroma, bleeding, wound infection, urinary retention, ileus, anatomic damage, chronic inguinal pain, and testicular cord damage among the three groups ($P>0.05$).

Discussion

There were no differences in age, gender, and surgical procedure among patients undergone laparoscopic inguinal hernia surgery. Thus, it can be stated that the three groups were homogeneous in terms of age, gender, and surgical technique, and these factors could not have affected our outcomes.

On the 7th and 30th postoperative days, we did not find any differences in pain score and hernia recurrence among the three groups.

There is a scarcity of studies comparing peritoneal closure with tacker, peritoneal closure with suturing, and fixing a dual mesh alone. In some previous studies, peritoneal closure with tacker and peritoneal closure with suturing were compared [13-15]. In some studies, peritoneal closure with suturing was compared with other techniques of laparoscopic inguinal hernia repair [16-19]. In some other studies, peritoneal closure with tacker was compared with other techniques of laparoscopic hernia repair surgery [20]. It seems that peritoneal closure with suturing and tacker could be a proper substitute for non-closure of the peritoneum in inguinal hernia repair surgery.

The findings of Ross et al. in 2015 were in line with our results. In their study, post-operative pain score in suture closure group was lower than that in tacker closure group [15].

Oguz et al. in 2015 found that pain score was lower at 7 and 30 days after surgery in suture closure group than tacker closure group. In 21-month follow up, there was no recurrence in the two groups [14]. Lee et al. In 2018 revealed same results as this study. They found no difference in hernia recurrence rate between patients undergone inguinal hernia surgery with suturing versus non-suturing of peritoneum. However, their findings were not congruent with our results in that pain score during the first postoperative week in sutured group was lower than unsutured group. Different methods used in these two studies could account for this discrepancy [17].

In the study by Ross et al. in 2017, they concluded that there is no difference in inguinal hernia repair between laparoscopic inguinal hernia repair using tacker, suture, and staples [18].

In Sandres et al. study in 2014, no difference in recurrence rate or surgical site infection was noted between various methods of mesh fixation (suturing and non-suturing) in patients with open inguinal hernia repair surgery. The degree of chronic pain in suturing technique was more than that in non-suturing technique [19].

Kitamura et al. in 2013 obtained the same results as ours, that is, they did not find a significant difference in hernia recurrence in laparoscopic hernia repair using tacker and suture. Moreover, there was no difference in the degree of pain

between the groups of peritoneal closure with tacker and suture [16].

Sajad et al. performed a meta-analysis in 2012. Congruent with our findings, they did not find any difference in postoperative pain and hernia recurrence between patients undergone peritoneal closure with tacker and those without mesh fixation [20].

According to our results, hospital stay after inguinal hernia repair surgery in the tacker group was more than that in the suture group, and in the suture group it was more than the dual mesh group. On the contrary, Ross et al. in 2015 showed that there is no difference in hospital stay after TAPP inguinal hernia surgery among the three groups of peritoneal closure with tacker, suture, and staples [15].

In contrast with our findings, Lee et al. in 2018 concluded that there is no difference in hospital stay between inguinal hernia repair surgery regarding peritoneal closure with suturing versus non-suturing [17].

In contrast with our results, Sanders et al. in 2014 concluded that there is no difference in hospital stay or patients' quality of life between various techniques of mesh fixation (suturing and non-suturing). In the current study, we noted no difference in returning to normal daily activity after inguinal hernia repair surgery among the three groups. Lee et al. in 2018 found that the time to return to normal daily activity in patients with peritoneal closure with suture was less than the group with non-suturing of the peritoneum. This disagreement could be due to the different methods adopted in the two studies [17].

Finally, our results showed no difference among the three groups in terms of post-inguinal hernia repair surgery complications like seroma, bleeding, wound infection, urinary retention, ileus, anatomical damage, inguinal area chronic pain, and spermatic cord damage, mainly due to their low incidence and sample size.

In line with our results, Ross et al. in 2015 concluded that there is no difference in post-inguinal hernia surgery complications among the groups of peritoneal closure with tacker, suture and staples [15]. Kitamura et al. in 2013 concluded that there is no difference in wound infection and bowel obstruction between peritoneal closure with tacker and suture [16]. Lee et al. in 2018 ascribed that there is no difference in TAPP inguinal hernia repairing surgery complications between peritoneal closure with tacker and suture [17].

In a meta-analysis performed by Sajad et al., there were no difference in complications after inguinal hernia repair surgery between the group with tacker peritoneal closure and the group without mesh fixation [20]. The discrepancy in the results of that study and the current one could be due to difference in sample size and research methods.

One of the advantages of this study is its clinical trial design. However, our study had some limitations. First, there are few similar studies, which makes it difficult to compare this study to other ones. Second, our sample size was limited. Thus, further studies with larger sample sizes are required. Apart from this, other studies should be commenced to evaluate other symptom of Hernia and GI tract [21].

Conclusion

According to our findings, there was no difference among the three techniques of peritoneal closure with tacker, peritoneal closure with suture, and leaving the peritoneum open plus dual mesh in pain degree, hernia recurrence rate, time to return to normal daily activity, and complication rate. Thus, peritoneal closure with suture and tacker can be a suitable alternatives for non-closure of the peritoneum in inguinal hernia repair surgery.

References

1. Townsend CM, Beauchamp RD, Evers BM, Mattox KL. Sabiston textbook of surgery E-book: Elsevier Health Sciences; 2016.
2. Billiar T, Andersen D, Hunter J, Brunicardi F, Dunn D, Pollock RE, et al. Schwartz's principles of surgery: McGraw-Hill Professional; 2009.
3. Burkitt H, Quick C, Gatt D, P. D. Principles of operative surgery: essential surgery. 2nd ed ed. New York: Churchill Livingstone; 1996. p. 80-3.
4. Deveney KE. Hernias and other lesions of the abdominal wall. Current surgical diagnosis and treatment, 11th edn Lange Medical Books/McGraw-Hill, New York. 2003;786.
5. Nathaniel J, Leel S, Swanstron W, Eubanks S. aparoscopic transabdominalpreperitoneal repair of inguinofemoral hernias. In: Robert J, Fitzgibbons J, Lee R, editors. Mastery of endo-scopic and laparoscopic surgery. 2nd ed ed. Philadelphia: Lippincott Williams Wilkins; 2005. p. 490.
6. Felix E, Michas C, Gonzalez M. Laparoscopic hernioplasty. Surgical endoscopy. 1997;11(1):36-41.
7. Franck C, Poulsen MH, Karampas G, Giraldi A, Rudnicki M. Questionnaire based evalu-ation of sexual life after laparoscopic surgery for endometriosis: A systematic review of prospec-tive studies. Acta obstetricia et gynecologica Scandinavica. 2018.
8. Genc V, Ensari C, Kulacoglu H, Ersoy E, Ergul Z. A questionnaire study on the surgeons' preferences for inguinal hernia repair after a decade. J Coll Physicians Surg Pak. 2009;19(11):744-6.
9. Ielpo B, Duran H, Diaz E, Fabra I, Caruso R, Malavé L, et al. A prospective randomized study comparing laparoscopic transabdominal preperitoneal (TAPP) versus Lichtenstein repair for bilateral inguinal hernias. The American Journal of Surgery. 2017.
10. Kulaçoglu H, Ozmen M, Oruç M, Koç M, Kama NA. Laparoscopic herniorrhaphy: preference rate among surgeons in Ankara, Turkey. East African medical journal. 2001;78(4):216-9.
11. Hewitt DB, Chojnacki K. Groin Hernia Repair by Open Surgery. Jama. 2017;318(8):764-.
12. Takata MC, Duh Q-Y. Laparoscopic inguinal hernia repair. Surgical Clinics. 2008;88(1):157-78.

13. Köckerling F, Schug-Pass C. Diagnostic laparoscopy as Decision Tool for Re-recurrent Inguinal hernia Treatment Following open Anterior and laparo-endoscopic posterior Repair. Fron-tiers in surgery. 2017; 4:22.
14. Oguz H, Karagulle E, Turk E, Moray G. Comparison of peritoneal closure techniques in laparoscopic transabdominal preperitoneal inguinal hernia repair: a prospective randomized study. Hernia. 2015;19(6):879-85.
15. Ross SW, Oommen B, Kim M, Walters AL, Augenstein VA, Heniford BT. Tacks, sta-ples, or suture: method of peritoneal closure in laparoscopic transabdominal preperitoneal inguinal hernia repair effects early quality of life. Surgical endoscopy. 2015;29(7):1686-93.
16. Kitamura RK, Choi J, Lynn E, Divino CM. Suture versus tack fixation of mesh in laparo-scopic umbilical hernia repair. JSLS: Journal of the Society of Laparoendoscopic Surgeons. 2013;17(4):560.
17. Lee SR, Park S-S. The novel technique of transabdominal preperitoneal hernioplasty her-niorrhaphy for direct inguinal hernia: suture repair of hernia defect wall. Journal of Laparoendo-scopic & Advanced Surgical Techniques. 2018;28(1):83-8.
18. Ross SW, Groene SA, Prasad T, Lincourt AE, Kercher KW, Augenstein VA, et al. Does peritoneal flap closure technique following transabdominal preperitoneal (TAPP) inguinal hernia repair make a difference in postoperative pain? A long-term quality of life comparison. Surgical endoscopy. 2017;31(6):2548-59.
19. Sanders D, Waydia S. A systematic review of randomised control trials assessing mesh fixation in open inguinal hernia repair. Hernia. 2014;18(2):165-76.
20. Sajid M, Ladwa N, Kalra L, Hutson K, Sains P, Baig M. A meta-analysis examining the use of tacker fixation versus no-fixation of mesh in laparoscopic inguinal hernia repair. Interna-tional Journal of Surgery. 2012;10(5):224-31.
21. Mirzaei R, Mahjoubi B, Negahi AR. Acute Lower Gastrointestinal Bleeding Caused by Congenital Portosystemic Shunt: A Case Report and Review of the Literature. Govaresh/ Vol. 22, No.1, Spring 2017; 68-72.