Research Article

INTERNATIONAL RESEARCH JOURNAL OF PHARMACY

www.irjponline.com

ISSN 2230-8407 [LINKING]

COMPARATIVE EVALUATION OF MESH FIXATION USING ABSORBABLE AND NON-ABSORBABLE TACKERS FOR LAPAROSCOPIC VENTRAL HERNIA REPAIR IN TERMS OF EFFECTIVENESS, COMFORT AND PROBLEMS

Dr. Amit Kumar Saxena,[1*] Dr. Chandan Kumar[2]

[1*,2]Assistant professor Department of General Surgery, Lord Buddha Koshi Medical College & Hospital, Saharsa, Bihar

Corresponding author

Dr. Amit Kumar Saxena

Email id: Saxenaamit233@gmail.com

How to cite: Saxena AK, Kumar C. Comparative evaluation of mesh fixation using absorbable and non-absorbable tackers for laparoscopic ventral hernia repair in terms of effectiveness, comfort, and problems. International Research Journal of Pharmacy, 2021,12:11:27-30.

DOI: 10.7897/2230-8407.1211174

==========

ABSTRACT

Background: The use of non-absorbable tackers during laparoscopic incisional ventral hernia repair (LIVHR) has been associated with a significant incidence of both acute and chronic discomfort. Several absorbable tackers have been developed and used to alleviate this pain. Nevertheless, there aren't many research in the literature that compare two.

Aim: The purpose of this study is to compare the comfort, effectiveness, and side effects of mesh fixation with absorbable and non-absorbable tackers for laparoscopic ventral hernia repair.

Methods: The study evaluated 120 participants, who were split into two groups of 60 each. Group I participants received mesh fixation using absorbable tackers, whereas Group II participants received mesh fixation using non-absorbable tackers. Postoperative visual analogue scale (VAS) ratings, length of hospital stay, and time to resume regular activities were used to evaluate all individuals in both groups.

Results: When it came to demographic information and hernia features, participants from both groups had statistically insignificant differences. VAS scores at 0 days, 1 week, 3 months, and 6 months showed nonsignificant outcomes. The length of their hospital stay, the time it took them to resume their regular activities, and postoperative problems did not show any statistically significant differences.

Conclusion: concerns about discomfort or recurrence should not influence the decision to use absorbable or non-absorbable tackers for mesh fixation during surgery. However, because of their low cost, absorbable tackers may be the best option for laparoscopic incisional ventral hernia repair.

Keywords: Absorbable tackers, laparoscopic incisional ventral hernia repair, mesh fixation, non-absorbable tackers, VAS

INTRODUCTION

Over the past several decades, surgery to treat a ventral hernia has changed significantly from direct suture repair to the use of synthetic mesh to provide tension-free repair. Laparoscopic ventral hernia repair procedures have become increasingly popular because to the excellent outcomes and lower recurrence rates documented in earlier publications, while open procedures were historically often used. There are a number of benefits of laparoscopic ventral hernia repair over open hernia repair procedures, such as a decreased risk of wound complications, a decreased chance of recurrence, and a faster recovery period.[1]

Sutures have historically been utilized in open ventral hernia repair procedures. Nevertheless, mesh fixation, mesh fixation with sutures, absorbable tacker fixation, non-absorbable tacker fixation, and the use of fibrin glue to achieve tension-free healing have all largely supplanted sutures in recent years.

Both absorbable and non-absorbable tackers have been used to secure the mesh in the laparoscopic procedure for ventral hernia repair. Non-absorbable tackers (NAT) have been connected to a number of side effects, including adhesion development, intestinal perforation, and postoperative discomfort. In the belief that mesh integration with the host's tissues eliminates the need for permanent attachment, absorbable tackers have recently been produced for use in conjunction with lightweight meshes. However, there is no published proof that absorbable tacks produce results that are the same as those of non-absorbable tacks in terms of fixation strength and recurrence rates.

It has been stated that the most effective method for evaluating the short- and long-term effectiveness of absorbable and non-absorbable tacks is to directly compare them. Thus, the purpose of this study was to compare the effectiveness, comfort, recurrence, and complications of mesh fixation using absorbable and non-absorbable tackers for laparoscopic repair of ventral hernias.

MATERIALS AND METHODS

In order to compare the effectiveness, comfort, recurrence, and complications of mesh fixation with absorbable and non-absorbable tackers for laparoscopic ventral hernia repair, the current prospective research was conducted. The Institute's Department of General Surgery provided the research participants. Prior to research participation, informed permission was obtained verbally and in writing from all subjects and school officials.

Participants in the current study who attended the Institute during the designated study period and had a ventral hernia diagnosis were included. Both male and female participants with simple ventral hernias, including incisional hernias, between the ages of 18 and 65 were evaluated for the research.

Subjects who needed component separation, were converted to open surgery for any reason, were deemed unfit for general anesthesia, had a defect larger than 5 cm, required any additional intra-abdominal procedures, had any comorbid conditions, such as diabetes mellitus or coronary artery disease, or had a history of hernias were not allowed to participate in the study.

At random, 120 participants were split into two groups of 60 each for the assessment of this study. Group I participants received mesh fixation with absorbable tackers, whereas Group II participants received mesh fixation with non-absorbable tackers. Under general anesthesia and endotracheal intubation, all participants were treated with three ports: two were 5mm working ports, and one was utilized for a 12mm camera. Other ports were utilized if required. After removing adhesions, the size of the defect was assessed.

In order to secure the mesh in a double crown fashion, a suitable mesh size was created to cover 5 cm on all sides of the defect, which was entered via a 12mm port. Using transfacial sutures, tackers were positioned at a minimum of 4 corners and 1.5–2 cm apart.

The usage of absorbable and non-absorbable tacks was then used to randomly assign these 120 participants to Group I and Group II. Mesh fixation in absorbable tackers was accomplished using absorbable tack, whereas titanium helical tacks were positioned throughout the whole parameter, approximately 1-2 cm apart, at a distance of approximately 5 mm inside the mesh edge for non-absorbable tack. Trocars were taken out and 10mm fascial flaws were sealed after mesh fixation. Instructions for mobility and standard postoperative care were given to each participant. For the first twenty-four hours after surgery, patient-controlled analgesia was administered.

After surgery, each patient was monitored for six months. On the first, seventh, one, three, and six months after the day of the operation, follow-up was conducted in the surgical department. A VAS score of 0 indicated no pain and a score of 10 indicated the greatest possible agony. The characteristics evaluated were chronic pain, early postoperative pain, and VAS ratings. Additionally, the length of hospital stay, time to return to regular activities, any wound hematomas or seromas, and hernia recurrence were evaluated in each of the participants from both groups.

SPSS (Statistical Package for the Social Sciences), Fisher's exact test, Mann Whitney U test, and chi-square test were used to statistically evaluate the data, software version 24.0 (IBM Corp., Armonk. NY, USA) using ANOVA, chi-square test, and student's t-test. The significance level was considered at a p-value of <0.05.

RESULTS

For laparoscopic ventral hernia repair, the current prospective study sought to compare the effectiveness, comfort, recurrence, and complications of mesh fixation using absorbable and non-absorbable tackers. 120 participants were evaluated for this study and split into two groups of 60 each. Group I participants received mesh fixation using absorbable tackers, whereas Group II participants received mesh fixation using non-absorbable tackers... Postoperative visual analogue scale (VAS) ratings, hospital stay duration, complications, recurrence, and time to return to regular activities were used to evaluate all participants in both groups.

When looking at demographic data, it was seen that Group I had 26.7% (n=16) men and 73.3% (n=44) females, whereas Group II had 23.3% (n=14) males and 76.7% (n=46) females. 20% (n=12), 36.7% (n=22), 40% (n=24), and 3.3% (n=2) of the participants in Group I were between the ages of 21 and 30; in Group II, there were 3.3% (n=2), 13.3% (n=8), 43.3% (n=26), 36.7% (n=22), and 3.3% (n=2) of the individuals from the ages of 21 to 30, 31 to 40, 41 to 50, 51 to 60, and >60. The research participants in Groups I and II had mean ages of 48.21±7.80 and 48.2±7.55 years, respectively, indicating a statistically insignificant difference (p=0.931) (Table 1).

According to the study findings, there was no significant difference in the postoperative mean VAS scores between groups I and II of study participants at 0 days, 1 day, day 2, 1 week, 1 month, 3 months, and 6 months (p=0.11, 0.52, 0.57, 0.84, 0.31, 0.86, and 0.49, respectively) (Table 2). When comparing the mean time to return to normal activity between the two study groups, it was found that Group I, which had mesh fixation with absorbable tackers, had a mean time of 11.0±2.51 days, which was shorter than Group II, which had a mean time of 11.55±2.39 days. However, Table 3 shows that the difference was statistically non-significant at p=0.54.

Discussion The 120 participants in the current study were split into two groups of 60 each, and Group I had mesh fixation using absorbable tackers, whereas Group II received mesh fixation using non-absorbable tackers. Postoperative VAS (visual analogue scale) ratings, hospital stay duration, complications, recurrence, and time to return to regular activities were used to evaluate all participants in both groups.

Research findings indicated that there were 26.7% (n=16) males and 73.3% (n=44) females in Group I and 23.3% (n=14) males and 76.7% (n=46) females in Group II. The present study's design was similar to that of earlier studies by Kitamura RK et al. (2013) and Eriksen JR et al. (2006), where authors used study design similar to the present study in their respective studies in ventral hernia repair subjects. Group I included no subjects in the age range of 21-30 years, 20% (n=12), 36.7% (n=22), 40% (9n=24), and 3.3% (n=2) of subjects from 31-40, 41-50, 51-60, and >60 years, while Group II included 3.3% (n=2), 13.3% (n=8), 43.3% (n=26), 36.7% (n=22), and 3.3% (n=2) of subjects from 21-30, 31-40, 41-50, 51-60, and >60 years, respectively.

The research participants in Groups I and II had mean ages of 48.21±7.80 and 48.2±7.55 years, respectively, indicating a statistically insignificant difference (p=0.931). The findings of Wright BE et al7 (2002) and Wassenaar E et al. (2010), who evaluated patients having ventral hernia surgery with similar demographics to the current investigation, were in line with these results. The study found that there was no significant difference between groups I and II in terms of postoperative mean VAS scores at 0 days, 1 day, day 2, 1 week, 1 month, 3 months, and 6 months (p=0.11, 0.52, 0.57, 0.84, 0.31, 0.86, and 0.49, respectively). Such results were consistent with those of Nguyen SQ et al. (2008) and Eriksen JR et al. (2011), whose postoperative VAS scores following hernia repair were similar to those of the current research.

Regarding the evaluation of the average time to resume regular activities for the two study groups, it was found that the average time for Group I, which underwent mesh fixation with absorbable tackers, was 11.0±2.51 days, which was less than the average for Group II, which was 11.55±2.39 days. Nevertheless, at p=0.54, the change was statistically insignificant. The findings of Bansal VK et al. (2016) and Colak E et al. (2015) were in agreement with these findings where. In previous trials, the authors found no significant difference in the meantime to return to normal activity between absorbable and non-absorbable tackers, which is comparable to the current study.

CONCLUSION

Notwithstanding its limitations, the current study comes to the conclusion that worries about pain or recurrence should not influence the decision to use absorbable or non-absorbable tackers for mesh fixation during surgery. However, because of their low cost, absorbable tackers may be the best option for laparoscopic incisional ventral hernia repair. To get confirmatory results, further longitudinal studies with a bigger sample size and longer monitoring are required.

REFERENCES

1. Bansal VK, Misra MC, Babu D, Singhal P, Rao K, Sagar R, Kumar S, Rajeshwari S, Rewari V. Comparison of long-term outcome and quality of life after laparoscopic repair of incisional and ventral hernias with suture fixation with and without tacks: a prospective, randomized, controlled study. Surg Endosc. 2012;26:3476–3485.
2. Melman L, Jenkins ED, Deeken CR, Brodt MD, Brown SR, Brunt LM, Eagon JC, Frisella M, Matthews BD. Evaluation of acute fixation strength for mechanical tacking devices and fibrin sealant versus polypropylene suture for laparoscopic ventral hernia repair. Surg Innov. 2010;17:285–290.
3. Hollinsky C, Kolbe T, Walter I, Joachim A, Sandberg S, Koch T, Rülicke T, Tuchmann A. Tensile strength and adhesion formation of mesh fixation systems used in laparoscopic incisional hernia repair. Surg Endosc. 2010;24:1318–1324

4. Wassenaar E, Schoenmaeckers E, Raymakers J, van der Palen J, Rakic S. Mesh-fixation method and pain and quality of life after laparoscopic ventral or incisional hernia repair: a randomized trial of three fixation techniques. Surg Endosc. 2010;24:1296–1302.
5. Kitamura RK, Choi J, Lynn E, Divino CM. Suture versus tack fixation of mesh in laparoscopic umbilical hernia repair. JSLS. 2013;17:560–564.
6. Eriksen JR, Poornoroozy P, Jørgensen LN, Jacobsen B, Friis-Andersen HU, Rosenberg J. Pain, quality of life and recovery after laparoscopic ventral hernia repair. Hernia. 2009;13:13–21.
7. Wright BE, Niskanen BD, Peterson DJ, Ney AL. Laparoscopic ventral hernia repair: are there comparative advantages over traditional methods of repair? The American Surgeon. 2002;68:291-96.
8. Wassenaar E, Schoenmaeckers E, Raymakers J, Van Der Palen J, Rakic S. Mesh fixation method and pain and quality of life after laparoscopic ventral or incisional hernia repair: A randomised trial of three fixation techniques. Surg Endosc. 2010;24:1296-302.
9. Nguyen SQ, Divino CM, Buch KE, Schnur J, Weber KJ, Katz LB, Reiner MA, Aldoroty RA, Herron DM. Postoperative pain after laparoscopic ventral hernia repair: a prospective comparison of sutures versus tacks. JSLS. 2008;12:113–116.
10. Eriksen JR. Pain and convalescence following laparoscopic ventral hernia repair. Dan Med Bull. 2011;58:B4369.
11. Bansal VK, Asuri K, Panaiyadiyan S, Kumar S, Subramaniam R, Ramachandran R, et al. Comparison of absorbable versus nonabsorbable tackers in terms of long-term outcomes, chronic pain, and quality of life after laparoscopic incisional hernia repair: A randomised study. Surg Laparosc Endosc Percutan Tech. 2016;26:476-83.
12. Colak E, Ozlem N, Kucuk GO, Aktimur R, Kesmer S, Yildirim K. Prospective randomised trial of mesh fixation with absorbable versus non absorbable tackerer in laparoscopic ventral incisional hernia repair. Int J Clin Exp Med. 2015;102:541-47.

Age (years)	**Group I**		**Group II**	
	n=60	**%**	**n=60**	**%**
Gender				
Males	16	26.7	14	23.3
Females	44	73.3	46	76.7
Years				
21-30	0	0	2	3.3
31-40	12	20	8	13.3
41-50	22	36.7	26	43.3
51-60	24	40	22	36.7
>60	2	3.3	2	3.3
Mean	48.21±7.80		48.2±7.55	
p-value	0.931			

Table 1: Age range (years) and gender distribution in study subjects

Postoperative VAS scores	**Group I**	**Group I**	**p-value**
0 day	6.45±1.55	6.4±1.17	0.11
1 day	3.45±0.92	3.31±0.74	0.52
2 days	1.6±0.64	1.5±0.77	0.57
1 week	1.44±0.79	1.41±0.70	0.84
1 month	1.11±1.14	0.84±0.91	0.31
3 months	0.3±0.81	0.44±0.66	0.86
6 months	0.2±0.19	0.4±0.25	0.49

Table 2: Postoperative mean VAS scores in two groups of study subjects

Time to normal activity return (mean)	**Group I**	**Group II**	**p-value**
Mean ± S. D	11.0±2.51	11.55±2.39	0.54

Table 3: Mean time to return to the normal activity in study subjects