Research Article

INTERNATIONAL RESEARCH JOURNAL OF PHARMACY

www.irjponline.com

ISSN 2230-8407 [LINKING]

COMPLICATIONS OF MESH FIXATION WITH NON-ABSORBABLE AND ABSORBABLE TACKERS FOR LAPAROSCOPIC VENTRAL HERNIA REPAIR A COMPARATIVE STUDY

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How to cite: Badar A, Bhide AR. Complications of mesh fixation with non-absorbable and absorbable tackers for laparoscopic ventral hernia repair a comparative study. International Research Journal of Pharmacy.2021;12:2:42:-45.

Doi:10.7897/2230-8407.1202126

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ABSTRACT

Background: Due to the use of non-absorbable tackers, LIVHR (laparoscopic incisional ventral hernia repair) has been associated with a high incidence of both acute and chronic pain. Several absorbable tackers have been introduced and used to alleviate this discomfort. Nevertheless, there are few research in the literature that compare two.

Aim: The purpose of this study was to compare the effectiveness, comfort, and complications of mesh fixation for laparoscopic ventral hernia repair using absorbable and non-absorbable tackers.

Methods: The 120 participants in this study were split into two groups of 60 each, with Group I participants receiving mesh fixation using absorbable tackers and Group II participants receiving mesh fixation using non-absorbable tackers. Postoperative VAS scores, length of hospital stay, and time to resume regular activities were used to evaluate all subjects from both groups.

Results: When it came to demographic information and hernia features, subjects from both groups exhibited statistically insignificant differences. Additionally, there were no noteworthy findings for VAS scores at 0 days, 1 week, 3 months, and 6 months. Postoperative problems, length of hospital stay, and time to resume regular activities did not differ statistically significantly.

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 they are less expensive, absorbable tackers may be the better option for laparoscopic incisional ventral hernia repair.

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

INTRODUCTION

Although open ventral hernia repair surgeries were historically often performed, laparoscopic ventral hernia repair surgeries have become increasingly popular due to prior research showing improved outcomes and lower recurrence rates. Compared to open hernia repair procedures, laparoscopic ventral hernia repair offers a number of benefits, such as reduced rates of wound complications, recurrence, and recovery time.[1]

Sutures were traditionally utilized in open ventral hernia repair procedures. But in order to achieve a tension-free repair, mesh fixation, mesh fixation with sutures, non-absorbable tackers fixation, absorbable tackers fixation, and fibrin glue are now frequently used in place of sutures. Both absorbable and non-absorbable tackers have been used to secure the

mesh in the laparoscopic procedure for ventral hernia repair. Non-absorbable tackers, or NATs, have been connected to a number of issues, including adhesion formation, intestinal perforation, and postoperative discomfort.[2]

Recently, absorbable tackers have been used in conjunction with lightweight meshes under the theory that once mesh integration with the host's tissues has been accomplished, permanent attachment is not required. However, in terms of recurrence rates and fixation strength, absorbable tacks yield results that are identical to those of non-absorbable tacks.[3] It has been observed that the best method for evaluating the short-term and long-term effectiveness of these two tacks is to directly compare absorbable tacks to non-absorbable tacks. In order to compare the effectiveness, comfort, recurrence, and complications of mesh fixation using absorbable and non-absorbable tackers for laparoscopic ventral hernia repair, this study was conducted.

MATERIALS AND METHODS

The Institute's Department of General Surgery provided the current prospective study participants. Before participating in the study, all subjects and school administrators gave their verbal and written informed consent. Participants with ventral hernias who attended the Institute during the specified study period were included in this study.

The study evaluated individuals with uncomplicated ventral hernias, including incisional hernias, who were between the ages of 18 and 65. The study excluded participants who needed component separation, were converted to open surgery for any reason, were unfit for general anesthesia, had defects larger than 5 cm, required any additional intra-abdominal procedures, had any comorbidities, such as diabetes mellitus or coronary artery disease, or had recurrent hernias.

In the current study, 120 participants were randomly assigned to two groups of 60 each. Group I participants received mesh fixation using absorbable tackers, while Group II participants received mesh fixation using non-absorbable tackers. Three ports—one for a 12mm camera and the other two for 5mm working ports—were utilized to manage all individuals under general anesthesia and endotracheal intubation. As needed, more ports were utilized. After removing adhesions, the size of the defect was measured. Tackers were employed for mesh fixation in a double crown manner, with tackers spaced 1.5–2 cm apart at least four corners utilizing transfacial sutures. A suitably sized mesh was created to cover 5 cm on all sides of the defect, which was accessed via a 12 mm port.

Based on the use of absorbable and non-absorbable tacks, these 120 participants were subsequently split into Groups I and II at random. For non-absorbable tack, titanium helical tacks were positioned at a distance of around 5 mm inside the mesh edge along the entire parameter, about 1-2 cm apart, while absorbable tackers used absorbable tack to secure the mesh. Trocars were extracted and 10mm fascial flaws were sealed following mesh fixation. Conventional postoperative care and mobilization instructions were given to all individuals. For the first twenty-four hours after surgery, patient-controlled analgesia was administered.

After surgery, each participant was monitored for six months. On days 1, 7, 1 month, 3 months, and 6 months after the procedure, follow-up was conducted in the surgery department. Chronic pain, early postoperative pain, and VAS scores—0 denoting no pain and 10 denoting the greatest possible pain—were the factors evaluated. Additionally, all participants from both groups were evaluated for hernia recurrence, any wound hematomas or seromas, time to resume regular activities, and length of hospital stay.

The chi-square test, Fisher's exact test, Mann Whitney U test, and SPSS software with ANOVA, chi-square test, and student's t-test were used to statistically analyse the data. A p-value of less than 0.05 was used as the significance criterion.

RESULTS

In order to compare the effectiveness, comfort, recurrence, and complications of mesh fixation with absorbable and non-absorbable tackers for laparoscopic ventral hernia repair, this prospective study was conducted. The present study assessed 120 subjects that were divided into two groups of 60 subjects each where Group I subjects underwent mesh fixation with absorbable tackers and Group II subjects were placed mesh fixation with non-absorbable tackers. Postoperative VAS (visual analogue scale) scores, length of hospital stay, complications, recurrence, and time to resume regular activities were all used to evaluate all participants in both groups.

According to demographic statistics, Group I had 26.7% (n=16) males and 73.3% (n=44) females, whereas Group II had 23.3% (n=14) males and 76.7% (n=46) females. In Group I, there were no subjects aged 21–30, 20% (n=12), 36.7% (n=22), 40% (n=24), and 3.3% (n=2) from 31–40, 41–50, 51–60, and >60 years; 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). The average age of research participants in Groups I and II was 48.21±7.80 and 48.2±7.55 years, respectively, with p=0.931 indicating a statistically non-significant difference (Table 1).

At 0 days, 1, 2, 7 days, 1, 3, and 6 months, groups I and II's postoperative mean VAS scores showed a non-significant difference with p=0.11, 0.52, 0.57, 0.84, 0.31, 0.86, and 0.49, respectively (Table 2).

The mean time to resume regular activities was found to be 11.0±2.51 days in Group I, when mesh fixation with absorbable tackers was performed, and 11.55±2.39 days in Group II. However, at p=0.54, the difference was not statistically significant (Table 3).

DISCUSSION

The 120 participants in the current study were split into two groups of 60 each, with Group I participants receiving mesh fixation using absorbable tackers and Group II participants receiving mesh fixation using non-absorbable tackers. Postoperative VAS (visual analogue scale) scores, length of hospital stay, complications, recurrence, and time to resume regular activities were all used to evaluate all participants in both groups. The current study's design was comparable to that of earlier research by Kitamura RK et al. (2013) and Eriksen JR et al. (2009), both of which used similar study designs in participants undergoing ventral hernia repair.

According to the study's demographic data, Group I had 26.7% (n=16) males and 73.3% (n=44) females, whereas Group II had 23.3% (n=14) males and 76.7% (n=46) females. In Group I, there were no subjects aged 21–30, 20% (n=12), 36.7% (n=22), 40% (n=24), and 3.3% (n=2) from 31–40, 41–50, 51–60, and >60 years; 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). The average age of research participants in Groups I and II was 48.21±7.80 and 48.2±7.55 years, respectively. This difference was statistically not significant (p=0.931). These findings were in line with those of Wright BE et al.7 and Wassenaar E et al.8, who evaluated patients receiving ventral hernia repair whose demographics were similar to those of the current study.

A non-significant difference was seen for the postoperative mean VAS scores in groups I and II at 0-day, 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). These results were consistent with research by Nguyen SQ et al. (9) and Eriksen JR et al. (10), whose postoperative VAS scores following hernia repair were similar to the current study's findings.

Regarding the evaluation of the average time to resume regular activities in two groups of research participants, it was found that Group I, where mesh fixation with absorbable tackers was performed, had a mean time of 11.0±2.51 days, which was less than Group II's mean time of 11.55±2.39 days. However, with p=0.54, the difference was not statistically significant. These results were in line with the findings of Bansal VK et al. (2016) and Colak E et al. (2015), who found that there was no significant difference between the mean time to return to regular activity with absorbable and non-absorbable tackers.

CONCLUSION

Within its limits, the current study shows that concerns about pain or recurrence should not influence the choice of mesh fixation during surgery using absorbable or non-absorbable tackers. However, because of their low cost, absorbable tackers may be the best option for laparoscopic incisional ventral hernia repair. To obtain confirmatory results, more longitudinal studies with a bigger sample size and longer monitoring are required.

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S. No	Age (years)	Group I		Group II	
		n=60	%	n=60	%
1.	**Gender**				
a)	Males	16	26.7	14	23.3
b)	Females	44	73.3	46	76.7
2.	**Years**				
3.	**21-30**	0	0	2	3.3
4.	**31-40**	12	20	8	13.3
5.	**41-50**	22	36.7	26	43.3
6.	**51-60**	24	40	22	36.7
7.	**>60**	2	3.3	2	3.3
8.	**Mean**	48.21±7.80		48.2±7.55	
9.	**p-value**	0.931			

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

S. No	Postoperative VAS scores	Group I	Group I	p-value
1.	**0 day**	6.45±1.55	6.4±1.17	0.11
2.	**1 day**	3.45±0.92	3.31±0.74	0.52
3.	**2 days**	1.6±0.64	1.5±0.77	0.57
4.	**1 week**	1.44±0.79	1.41±0.70	0.84
5.	**1 month**	1.11±1.14	0.84±0.91	0.31
6.	**3 months**	0.3±0.81	0.44±0.66	0.86
7.	**6 months**	0.2±0.19	0.4±0.25	0.49

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

S. No	Time to normal activity return (mean)	Group I	Group II	p-value
1.	**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