

“COMPARATIVE STUDY OF USE OF TACKER VS GLUE FOR FIXATION OF MESH IN LAPAROSCOPIC MESH REPAIR OF VENTRAL HERNIAS”

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Abstract:

Background

An abdominal wall hernia, or a ventral hernia which is a age old disease, often occurs at the weakest point of the abdominal wall or it may occur through potentially weaker section of the abdominal wall. It includes umbilical, incisional, epigastric, supraumbilical, infraumbilical etc. There are many technique available to repair the abdominal wall hernia. It has evolved from simple repair of the hernia to strengthening of the abdominal wall with prosthetic materials.

Methodology

A total of 52 cases ; 26 cases randomly to two groups, either tacker or glue fixation. These patients were followed up in the surgical outpatient clinic once in week for 1st month, then once in a fortnight for 2nd month ,a minimum period of up to 6 months.

Conclusion

Time taken for completion of surgery was less in glue fixation, Post operative hospital stay was less in glue fixation group, Cost of surgery was more in tacker fixation

INTRODUCTION

An abdominal wall hernia, or a ventral hernia which is a age old disease, often occurs at the weakest point of the abdominal wall or it may occur through potentially weaker section of the abdominal wall. (1) It includes umbilical, incisional, epigastric, supraumbilical, infraumbilical, etc. The intra-abdominal pressure forces the contents to move out from the defect. The protruded contents dilate the opening further, leading to increased diameter of the defect, and hence, more contents protrude. This positive feedback loop results in increase in size of hernia, and continues till either the hernia is operated, or it develops complications like obstruction, strangulation, or incarceration. The mechanism behind the continued progression of hernia can be explained by Pascal's law, which states that "A change in pressure at any point in an enclosed fluid at rest is transmitted undiminished to all points in the fluid." In this condition, the "fluid" can be taken as the abdominal cavity contents. So, a rise in pressure in the abdominal cavity is transmitted to all points along the abdomen equally.

There are many technique available to repair the abdominal wall hernia. It has evolved from simple repair of the hernia to strengthening of the abdominal wall with prosthetic materials. (2) But during tissue repair surgeons always faced with a problem of too much of tissue damage and high recurrence rate. (3)Also, open technique of ventral hernia repair involved extensive dissection of surrounding tissues, which led to complications, such as wound infections, seroma formation, etc. To overcome these, laparoscopic techniques were devised. In 1991, LeBlanc and Booth described their experience with repair of incisional hernia using expanded polytetrafluoroethylene prosthetic graft using laparoscopic technique. Ever since its introduction,

the trend is toward attempting a laparoscopic repair of ventral hernias. In this technique, the contents of the hernia sac are reduced and a prosthetic mesh is placed intraperitoneally/preperitoneally extending beyond the borders of the fascial defect and held in place by either staples sutures or glue. The dilemma always persists regarding which technique is better, from a patient benefit point of view.

There are multiple variety of mesh fixation technique as well which are divided into either mechanical or non-mechanical. Mechanical method includes tissue repair technique such as tacker and suturing whereas non-mechanical methods include tissue gripping meshes and adhesive glues. Mechanical methods are hypothesized to cause more postoperative pain and increased risk of seroma formation, hematoma formation, and osteitis pubis due to tissue trauma and also have increased risk of chronic pain due to nerve entrapment. (4,5,6)

Nonmechanical methods do not have these disadvantages.

The study aims to compare the cost effectiveness, duration of surgery, duration of hospital stay and post-operative complications in patients undergoing laparoscopic hernia repair by using tacker and glue fixation of mesh.

MATERIAL AND METHODS

STUDY DESIGN:

COMPARATIVE PROSPECTIVE STUDY

SOURCE OF DATA:

Patients admitted to surgery department in Krishna Hospital and attending surgery OPD with ventral hernias during the period of DECEMBER 2020 To JUNE 2022 will be taken for study, considering the inclusion and exclusion criteria.

METHOD OF COLLECTION OF DATA:

A total of 52 cases ; 26 cases randomly to two groups, either tacker or glue fixation.

FOLLOW UP: These patients will be followed up in the surgical outpatient clinic once in week for 1st month, then once in a fortnight for 2nd month ,a minimum period of up to 6 months.

INCLUSION CRITERIA

1. Patients diagnosed with ventral hernias clinically in age 18 to 60
2. Patients with ventral hernias and defect size <6 cm without any complications were included.

EXCLUSION CRITERIA

1. Patients with body mass index >35
2. Patients with recurrence after previous repair
3. Patients afflicted with chronic obstructive pulmonary disease
4. Lower urinary tract syndrome
5. Prostatomegaly with complaints of nocturia
6. Patients unfit for general anesthesia
7. Patients with acute abdominal emergency

SAMPLE SIZE:52 patients with inclusion criteria will be studied from DECEMER 2020 to JUNE 2022 (18Months) $[(SD_1)^2+SD_2^2)(Z_{1-\alpha/2}+Z_{1-\beta})]/(M1-M2)^2$

CONDUCTION OF STUDY

Patients will be select for the study after taking careful detailed history, clinical examination, laboratory investigations, and ultrasound examination as described above. The patients eligible for the study will be select, inform, and explain regarding the above study and a proper inform, valid, written consent will be taken for participation in the study. Patients will be kept nil by mouth after 10 pm the previous day of surgery. Patients will be shave and prepare, and inform, valid, written consent for surgery will be taken. All patients receive preoperative dose of antibiotic. Patients will be operate by experienced laparoscopic surgeons of the hospital with experience of >50 laparoscopic ventral hernia repair (LVHR) procedures done previously. All incisions were infiltrated with local anesthetic at the end of the procedure. Duration of surgery will be measure from the time of incision to the time of closure. Patients will be start on liquid diet on the evening of surgery and full diet on the next morning of surgery. All patients will be encourage to mobilize as early as possible. Inj. Diclofenac sodium 50 mg intramuscular will be given as analgesic postoperatively on demand by the patient as guided by the VAS in which the pain experience by the patient was graded by the patient on a scale of 1 to 10 and recorded every 6 hourly for the first 24 hours postoperatively. Analgesics were given if VAS score was >5 (Fig. 1). Postoperative hospital stay will be measure from the date of surgery to the date of discharge. Patients will be ask to follow-up on day 7, at 1 month, and 3 months postoperatively. Suture removal will be done on postoperative day 7 in all cases. Time to return to normal activity will be note in all patients. Patients will reassess on all occasions and wound infection, port site herniation will be check, and all patients will follow up for minimum 6 months after surgery and will be assess for recurrence.

RESULTS:

Ventral hernia is an age disease which occurs in the population. Many techniques have been developed to close abdominal wall after surgery with minimal side effects and post operative complications. Such as suturing, mesh fixation with use of either tacker or glue.

Present study includes comparison of mesh fixation either using tacker or glue for the same. Total 52 cases were included in the study which were randomly distributed in the two groups of tacker and glue each group containing 26 patients.

The mean age in the tacker group was found to be 42.3 years and 40.2 years in the glue fixation group. The difference in the age groups was not statistically significant with p value was >0.05.

A study done by Vinaya Ambore et al (9) had similar finding in the study done to compare the tacker versus glue fixation study. The mean age of the study population in the study was found to be 38 years for glue fixation group and 38.77 years for tacker fixation group. This was not statistically significant difference in the age groups in terms of mean age. The total study population was distributed between the two groups as 26 each. And then gender analysis was done to see the frequency distribution for the same.

Out of 26 in tacker fixation group, 17 (65.38%) were males and 9 (34.6%) were females whereas in the glue fixation group total number of males were 15 (57.69%) and females were 11 (42.3%) in number. The total number of males in the study population were 32 (61.53%) and females were 20 (38.4%).

These findings were similar to the study done by Vinaya Ambore et al (9) that out of 60 cases total 28 cases were females (46.66%) whereas males were 32 (53.33%). There was slight male preponderance in the study group.

All the cases included in the study were of ventral hernia 100% (n=52) which were all distributed in the two groups equally, 26 patients in (50%) each group.

Comorbidities were found in the study population such as diabetes mellitus, hypertension, and some patients were found to have both the comorbidities together. Total 8 cases (15.38%) were having Diabetes Mellitus, 5 (9.6%) cases were having Hypertension whereas 4 cases (7.6%) were found to have both the conditions. 35 patients who participated in the study (67.3%) did not have any associated comorbidities.

In the tacker group 4 cases out of 26 were diagnosed with diabetes mellitus, 1 cases of hypertension and 2 cases were diagnosed with both, diabetes mellitus and hypertension. While 19 cases (65.38%) cases did not have any associated comorbidities. Similarly ,in patients undergoing fixation by glue, 4 cases were having diabetes mellitus, 4 were having hypertension and 2 cases had both the comorbidities together. Also it was found that 16 cases did not have any associated comorbidities.

All the patients in the study underwent the surgery for hernia repair. The duration of surgery was calculated for comparison in both the groups. It was found that the mean time taken for surgery for all the cases was 49.5 minutes with standard deviation of 9.3 minutes. Time taken for surgery in each group was also compared and p value was calculated after applying t test to see the statistical significance of the findings.

The mean time taken by the glue fixation group was 45.4 minutes whereas tacker fixation group surgeries took mean time of 53.2 minutes. The difference between two groups for the mean duration of surgery was statistically significant with the p value <0.05.

In the study by Vinaya ambore et al (9) found that the mean time taken for surgery was 83.67 minutes in the glue fixation group whereas it mean time for surgery was 64.50 minutes in the tacker group which was statistically significant.

In present study, pain and discomfort was calculated using visual analogue scale at 24 hours after surgery, on 2nd day and after month. The mean score was found to less in the glue fixation group compared to tacker. Mean score of VAS was 1.2 in the glue fixation compared to 2.9 in the tacker group at 24 hours whereas on 2nd days there was significant improvement in the pain score. It was found to be 0.15 in glue fixation group and 0.9 in the tacker fixation group. After one month during follow up, there was 0 pain in glue fixation and 0 in tacker fixation group. There was significant improvement in the glue fixation group in the visual analogue score compared to tacker fixation group.

Similar findings were there in the Vinaya ambore et al (9) group that the mean pain score of glue fixation group and tacker fixation group were at 24 hours 1 and 2.23 respectively.

Another study by J R Eriksen et al (7) found in their study of fibrin sealant versus titanium tacker in the mesh fixation in laparoscopic umbilical hernia repair. Found that in the fibrin sealant group reported less pain compared to tacker group on 0-2, both at rest (median value 19 versus 47 mm; p value=0.0025) and during activity (38 versus 60 mm; p value=0.014). The absolute difference in the pain score between groups was 19 and 20 at rest and during activity respectively.

A randomized control trial done by Hung Lau (8) where fibrin sealant was compared with mechanical stapling for mesh fixation found in the study that there was less usage of analgesics in the fibrin sealant group compared to the staples group. Although it was found that There was no significant difference in the postoperative pain score at rest and on coughing from the day of operation to postoperative day 6 between the groups.

The duration of hospital was also significantly less in the glue fixation group compared to tacker fixation group. Mean hospital stay was only 2.5 days (SD- 0.4) in the glue fixation group compared to 3.1 days (SD 0.5) in the tacker fixation group with p value less 0.05.

Similar to our study, J R Erickson et al (7) stated that the Patients in the FS group resumed normal daily activity earlier (after median 7 versus 18 days; P = 0.027) and reported significantly less discomfort.

In the study done by Vinaya Ambore et al (9) it was observed that mean duration of hospital stay was 3 days in the tacker fixation group whereas it was 2 days in glue fixation group.

Post operative pain and discomfort was comparable in both the groups. It was observed that out of 26 patients in tacker fixation group 10 patients felt and discomfort whereas 3 out of 26 patients in the glue fixation had experienced pain and discomfort. This finding was statistically significant with p value less than 0.05.

In the present study post operatively complications were found in both the groups which were comparable. In tacker fixation group, majority of patients had seroma 5 cases (19.23%) as the post operative complication followed by hematoma in 2 patients (7.6%), and bowel ileus in 2 patients (7.6%) in the tacker fixation group. There was no post operative complications such as bowel obstruction, or enterocutaneous fistula was seen.

In glue fixation group, there was significant improvement in the patient condition. Only one case of seroma (3.5%) was found in the glue fixation group and there were no other complications found in that group.

In the study by Vinaya Ambore et al (9) also had similar findings in the study that seroma was seen in 4 cases (13.33%), hematoma in 1 (3%), bowel ileus in 1 (3%) whereas intra abdominal complications such as bowel obstruction, bleeding from trocar site and enterocutaneous fistula were 0 in the tacker fixation group. And in glue fixation group had lesser complication rate 0/30 as compared to 6/30 (20%) in tacker fixation group.

It was also observed that cost of surgery was more in tacker fixation than glue fixation due to high cost of tacker.

CONCLUSIONS

52 participants were included in the study which were divided into two groups- tacker fixation and glue fixation group.

It was seen that time taken for completion of surgery was less compared in glue fixation group compared to tacker fixation.

Post operative hospital stay was less in glue fixation group compared to tacker fixation group.

It was also observed that the post operative complications were higher in tacker fixation group compared to glue fixation group.

It was also observed that cost of surgery was more in tacker fixation.

Therefore from the study it can be concluded that glue fixation is a better option for ventral hernia repair compared to tacker fixation.

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