

Original Research Article

Use of mesh fixation device in inguinal hernia

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ABSTRACT

Background: With attention to patient outcome after open inguinal hernia chronic inguinal region pain and discomfort are major complains due to nerve compression by sutures used for mesh fixation. Objectives to compare outcomes of mesh fixation with metallic versus delayed absorbable suture material in inguinal hernia through laparoscopic surgery.

Methods: This was prospective study conducted at department of general surgery in a Prime hospital, Dubai during the period of January 2022 to December 2022. Prior approval of local ethical committee was obtained. Total 100 male patients who underwent laparoscopic surgery were included in the study. Patients were split into two groups of 50 each. Metallic suture material (Tantallum 1-0) was used to fix the mesh in group 1 while mesh fixation was used in group 2 was completed with Vicryl 2-0, a delayed absorbable suture material. SPSS was used for analysis.

Results: There was appearance of post-operative pain in 20 patients, 10 patients, and 7 patients after 10 days, after 1 month and after 3 months, respectively in group 1 while for group 2, post-operative pain appeared in 12 patients, 4 patients, and 2 patients after 10 days, after 1 month and after 3 months, respectively. As such there was no statistically significant difference was found between two groups except for the appearance of the post-operative pain after 1 month ($p < 0.05$).

Conclusions: The recurrence rates for the two approaches are statistically equivalent. As a result, delayed absorbable material may be an effective mesh fixation substitute.

Keywords: Open inguinal hernia, Mesh fixation, Air knot, Non-absorbable suture, Delayed absorbable suture

INTRODUCTION

An abnormal protrusion of all or a portion of a tendon in an abnormal orifice in its enclosing cavity is known as an inguinal hernia. It is a frequent complaint among people who visit OPD for surgery.¹ A male older patient is more likely to have an inguinal hernia. 10% of patients have bilateral inguinal hernias, with 2/3 of patients having indirect and 1/3 having direct hernias.² One of the most popular surgical operations worldwide is the correction of this hernia. Nowadays, the majority of surgeons favor tension-free mesh repairs.³ The Lichtenstein tension-free hernioplasty is currently the surgery of choice for most people everywhere.⁴ The development of surgical

techniques, such as laparoscopic hernia repair, has led to the introduction of new mesh fixation techniques. There are various suture types. Simple metallic sutures to screw-type fasteners that are absorbable are some of the materials utilized to repair hernias.⁵ many surgeons still utilize them now for both open and laparoscopic repairs. The most crucial aspect of surgery is mesh fixation, which is traditionally done with metallic sutures but has recently been tried with delayed absorbable materials, such as staples and glue, with positive postoperative results in terms of minimal postoperative pain and paraesthesia and low risk of reoperation. Chronic inguinal pain and discomfort are common complaints following an open inguinal hernia because of nerve compression

caused by sutures utilized to repair mesh. Since metallic suture material is typically used to fix mesh, the goal of this study was to examine the post-operative results of mesh fixation with metallic vs. delayed absorbable suture material.

METHODS

This was prospective study conducted at department of general surgery in Prime hospital Dubai during the period of January 2022 to December 2022. Prior approval of local ethical committee was obtained. Total 100 male patients who underwent laparoscopic surgery were included in the study.

Inclusion criteria

Patients with unilateral or bilateral hernia, elective surgery performed and primary hernia repair were included in the study.

Exclusion criteria

Patients with age <18 years, obstructed/ strangulated inguinal hernias, emergency repair and recurrent hernia were excluded.

Methodology

Patients were split into two groups of 50 each. Metallic suture material (tantallum 1-0) was used to fix the mesh in group 1 while mesh fixation was used in group 2 was completed with Vicryl 2-0, a delayed absorbable suture material. Age, hernia type, location, and site, postoperative problems, hospital stay, and recurrence rates were all examined for each patient. Follow-up information was gathered for groin discomfort, paresthesia, seroma, hematoma, infections, recurrence rate, etc. after 10 days, 1 month, 3 months, and 1 year.

Statistical analysis

The statistical analysis was performed using SPSS for windows version 22.0 software (Mac, and Linux). The findings were present in number and percentage analyzed by frequency, percent, and Chi-squared test. Chi-squared test was used to find the association among variables. The critical value of p indicating the probability of significant difference was taken as <0.05 for comparison.

RESULTS

As per table 1 study includes total 100 number of male patients, in group 1 mesh fixation was done with metallic sutures and in group 2 mesh fixation was done with delayed absorbable material (vicryl 2-0). In group 1, the patients' mean age of 54 years and in group 2 mean age of 52 years in group 2. In group 1, 12 patients having right and 13 patients have left, and 12 patients have bilateral hernias while in group 2 there were 18 patients

having right, 11 patients have left, and 09 patients have bilateral inguinal hernias.

Table 1: Distribution based on age and side of hernia.

Variables	Group 1	Group 2
Age (Mean $\pm$ SD)	54 $\pm$ 18	52 $\pm$ 20
Hernia side		
Right	12	18
Left	13	11
Unilateral	13	12
Bilateral	12	09

Table 2: Post-operative pain in both groups.

Time period	Post-operative pain, n (%)		
	Group 1	Group 2	P value
After 10 days	20 (36)	12 (24)	0.14
After 1 month	10 (24)	4 (8)	0.01
After 3 months	7 (10)	2 (4)	0.21

As per table 2 there was appearance of post-operative pain in 20 patients, 10 patients, and 7 patients after 10 days, after 1 month and after 3 months, respectively in group 1 while for group 2, post-operative pain appeared in 12 patients, 4 patients, and 2 patients after 10 days, after 1 month and after 3 months, respectively. As such there was no statistical significant difference was found between two groups except for the appearance of the post-operative pain after 1 month ($p < 0.05$).

Table 3: Post-operative paraesthesia in both groups.

Time period	Post-operative paraesthesia, n (%)		
	Group 1	Group 2	P value
After 10 days	12 (24)	6 (12)	0.10
After 1 month	7 (14)	4 (8)	0.31
After 3 months	4 (8)	2 (4)	0.45

As per Table 3 the appearance of post-operative paresthesia in both surgical groups, there was more number of patients had developed paresthesia group 1 as compared to group 2 but it was not statistical significant.

Table 4: Post-operative complications.

Complications	Group 1, n (%)	Group 2, n (%)	P value
Scrotal hematoma	8 (14)	5 (12)	0.74
Seroma	4 (8)	5 (10)	0.64
Ecchymosis	3 (4)	4 (8)	0.32
Wound infection	0	0	-
Recurrence	2 (8)	1(4)	0.11
Average hospital stay	4 days	3 days	-

As per Table 4 there was more number of patients had developed complications group 1 as compared to group 2 barring ecchymosis which was more common in group 2. But again there was no statistical significant difference was found between two groups. Recurrence was low but more in group 1 and was not significant. Average hospital stay was 3.5 days in both groups.

DISCUSSION

In the current investigation, we discovered that group 1 experienced more post-operative pain development over time than group 2 did. In hernia surgery, postoperative persistent pain has emerged as one of the most crucial primary goals. According to several researches, the prevalence of pain might range from 0% to over 30%.⁶ The entrapment of a nerve by mesh or sutures may be the source of the discomfort. This can be prevented by locating the groin nerves or by securing the mesh with fibrin or biologic glues rather of sutures.⁷

The entrapment of a nerve by mesh or sutures may be the source of the discomfort. The groin can be located to prevent this. Instead of utilizing sutures to hold the mesh in place, biologic glues, fibrin, or nerves may be employed.^{8,9} Regarding the progression of post-operative paresthesia, the current study found that group 1 experienced more progression of paresthesia than group 2 at various time points. Entrapment of a nerve by mesh or suture is once again the main cause of the onset of paresthesia. Post-operative groin pain and discomfort are uncommon with delayed absorbable sutures made with the air knot technique.

At specialized clinics in the United States, the recurrence rate for Lichtenstein hernioplasty is generally less than 1%.^{10,11} Fixation using delayed absorbable sutures is not recommended. Inferior to suture material that cannot be absorbed. Recurrence rates and surgical complications don't differ significantly. Mesh fixation is an essential stage in hernia surgery for successful results, but other factors may also contribute to recurrence, making it challenging to choose the optimum suture material from that perspective other solutions, such as glues, staples, and tackers, now successfully available for fixations.¹²

Our study has few limitations firstly small sample size in a prospective study can change the associations and impact. Secondly, our findings cannot be useful in development of clinical practice guidelines for hernia repairs and further economic evaluations. Thirdly, no information was reported on the expertise of the surgeons performing mesh procedures. Fourthly, no information was provided on hernia size and impact and limitations of using some fixation techniques for larger hernias.

CONCLUSION

In Laparoscopic surgery, a straightforward, safe, and efficient alternative to tension-free open mesh fixation

with delayed absorbable suture material. With There are fewer odds of chronic groin discomfort and paresthesia following air knot fixation compared to the conventional way of fixation. This is because fewer nerves are compressed. The recurrence rates for the two approaches are statistically equivalent. As a result, delayed absorbable material may be an effective mesh fixation substitute.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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