

Original Research Article

The difference in outcome of patients with open inguinal hernia repair by using delayed absorbable sutures instead of non-absorbable sutures for mesh fixation

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ABSTRACT

Background: Different methods are found for mesh fixation in inguinal hernioplasty both open and laparoscopic. In open technique, sutures have been the method of choice for their reduced costs and surgeons' habits. Whether absorbable instead of non-absorbable sutures can be used still a matter of debate in view of hernia recurrence and post-operative complications.

Methods: This is a prospective done on 158 male patients with uncomplicated unilateral inguinal hernias. Two groups of 69 patients were evaluated after periods up to 1 year after open hernioplasty by using delayed absorbable sutures in one group (group 1) and non-absorbable sutures in the other group (group 2) for fixation of mesh.

Results: In spite of a noticeable reduction in complication in the group 1 in term of number and percentage when compared with group 2 mainly chronic pain, there is no significant difference (p value > 0.05). However, these results are associated with zero recurrence in both groups during a period of one year follow up.

Conclusions: Delayed absorbable sutures are good alternative of non-absorbable sutures in open mesh hernia repair associated with less complications and almost no increase in chance of recurrence.

Keywords: Inguinal hernia, Mesh repair, Suture fixation, Complications, Lichtenstein hernioplasty

INTRODUCTION

Inguinal hernia is a common disease affecting a large number of people with about 20 million surgical operations for hernia repair are performed yearly around the world.^{1,2}

Two different approaches for inguinal hernia surgery are found including open and laparoscopic repair. The most commonly used open procedure is the Lechtenstein tension free repair since 1989 and it became the standard open technique at present time by the guidelines.^{3,4,5}

Open mesh repair of inguinal hernia is relatively easier to do, less expensive and can be done under local anesthesia.⁶ On the other hand, laparoscopic repair needs

higher technical requirements, longer learning curve and high economic cost. Some studies mention that laparoscopic repair might be associated with more inguinal hematoma and in the TAPP repair more infection and vesical organs injury and adhesions.⁷⁻¹⁰

In both open and laparoscopic approach, the type of mesh used for repair of hernia and the method of its fixation still a matter of debate.^{11,12}

In hernia surgery, the main challenge regarding fixation of mesh is to find a balance between a secure fixation to avoid recurrence and tissue trauma and nerve entrapment as the main cause of chronic pain and discomfort. Both sutures and tissue adhesives were found to be safe equally in terms of recurrence and wound infection, but

glues are associated with less chronic pain in open technique, however the sutures still having the advantage of less medical cost.¹³

In the view of this economic benefit and availability of sutures, many studies were conducted by using modified mesh fixation which included changing the type or the number of sutures or the technique of knotting.^{14,15} The main goal of these studies is to improve the quality of life of patients and reduce the complications of inguinal hernia repair especially the chronic groin pain without affecting the rate of recurrence.^{16,17}

The aim of this study is to explore the advantage of using delayed absorbable sutures in mesh fixation hernioplasty over non-absorbable type in term of less complications with the same acceptable risk of hernia recurrence.

METHODS

This prospective study was achieved in a public hospital (Al Fayhaa Teaching Hospital) in Basra/Iraq between March 2017 and March 2020. The number of patients involved in the study was 158. All of them were males aging 18-70-year-old with unilateral uncomplicated inguinal hernias for elective open mesh repair.

Patients with bilateral hernias, bladder outlet obstruction, chronic cough, obstructed or strangulated hernias and those with recurrent hernias were excluded from the study. In addition, patients who did not complete the whole period of follow up for one year were also excluded.

Informed consents have been taken from all patients and agreement of the local ethical committee was taken. Surgery was done under general or spinal anesthesia according to the patient condition and anesthetic opinion with a prophylactic dose of cephalosporin 1 g infusion prior to skin incision. The patients were divided randomly into 2 groups according to the method used for mesh fixation in the surgical repair. Group 1 are patients with mesh fixation by delayed absorbable sutures (vicryl 2- 0) and group 2 were those in whom non-absorbable sutures (prolen 2-0) were used. After dealing with the sac whether direct or indirect and its contents if present, hernioplasty was achieved by polypropylene mesh patch fixed to the posterior inguinal wall by 5 stitches, one to the pubic tubercle, 2 stitches to the inguinal ligament with 1.5 cm distance and another 2 stitches to the conjoined tendon with the same distance apart. In both groups, the suturing technique involved air knotting of the stitch over the mesh surface and not to the mesh edges. After surgery, all patients in the 2 groups were observed in the ward until their discharge home and then followed after 10-day, 3 moths, 6 months and 1 year after surgery. The follow up was achieved by outpatient visit or by telephone survey.

The results of study were the analysis of patients age, hernia side and type, number and percentage of complications especially chronic pain, seroma, hematoma, infection, parasthesia and recurrence. Chi square test was used to assess for significance with the p value<0.05 considered to be of significant finding.

RESULTS

The mean age of patients was 37.2 years (range 18-67 years) in group 1 and 40.6 years (range 21-70) years in group 2 as shown in (Table 1).

Table 1: The range of age and the mean for patients in both groups.

Group	Age range (in years)	Mean
1	18-67	37.2
2	21-70	40.6

In group 1, 64.5% of hernias were right sided and 35.5% were left sided, while in group 2 the right sided hernia was found in 57% of patients and in 43% it was left side hernia as in (Table 2).

Table 2: The number of patients and percentage in each group according to hernia side.

Groups	Right (%)	Left (%)	Total (%)
1	51 (64.5)	28 (35.5)	79 (100)
2	45 (57)	34 (43)	79 (100)

The type of hernia was direct in 40.5% and indirect in 59.5% of patients in group 1. Direct hernias comprise 36.7% and indirect hernias 63.3% of patients in group 2 as shown in (Table 3).

Table 3: Number and percentage of patients in each group according to hernia type.

Group	Direct (%)	Indirect (%)	Total (%)
1	32 (40.5)	47 (59.5)	100 (100)
2	29 (36.7)	50 (63.3)	Total (100)

Table 4 describes the frequency and percentage of each complication in both groups and degree of significance. Seroma developed in 10 patients (12.7%) in group 1 and in 6 patients (7.6%) in group 2.

Heamatoma occurs in 2 patients (2.5%) in group 2 and no patient in group 1 complains of this complication. Infection was recorded in 5 patients (6.3%) in group 1 and in 7 patients (8.9%) in group 2. Sinus at scar site was developed in one patient (1.3%) in group 1 and in 3 patients (3.8%) in group 2. Parasthesia was complained of by 2 patients (2.5%) in group 1 and by patients (5.1%) in group 2.

Five patients (6.3%) suffered from chronic pain lasting beyond 3 months after surgery in group 1 and 12 patients (15.2%) in group 2 had such pain.

No recurrence of hernia was recorded in both groups of patients after 1 year of follow up.

No significant difference was observed the incidence of complications between the two groups by using chi square where p value considered significant when it is <0.05.

Table 4: The number and percentage of complications in both groups with p value (chi square test).

Complication	Group 1 (%)	Group 2 (%)	P value
Seroma	10 (12.7)	6 (7.6)	0.2930
Heamatoma	0 (0.0)	2 (2.5)	0.1560
Infection	5 (6.3)	7 (8.9)	0.5494
Sinus	1 (1.3)	3 (3.8)	0.3126
Parasthesia	2 (2.5)	4 (5.1)	0.4066
Chronic pain	5 (6.3)	12 (15.2)	0.0723
Recurrence	0 (0.0)	0 (0.0)	

DISCUSSION

In open inguinal hernioplasty, no consensus about mesh fixation technique has ever been reached. Several types of fixation methods exist such as tacks, staples, self-fixing, fibrin sealants, glues, and sutures. The choice of which method to use strongly depends on the type of surgery and the type of defect but also (and often decisively) on surgeons' personal beliefs and local habits. In open technique both sutures and tissue adhesives have been proven equally safe in terms of recurrence and wound infection.

Chronic post herniorrhaphy groin pain is defined as a persistent postoperative pain that fails to resolve 3 months after surgery.¹⁸ Chronic pain and discomfort in the groin can occurs after Lichtenstien inguinal hernia repair in up to 25% of patients. The cause of this pain, in addition to other causes, is compression and entrapment of inguinal nerves by sutures used for mesh fixation.¹³

In our study, there were more chronic pain and discomfort when non-absorbable sutures were used in comparison with the use of delayed absorbable sutures. However, it is not significant, but it means that the choice of suture type and knotting (air knot) could improve the patient outcome and quality of life. These findings are similar to other studies done by Kharadi et al and Bharatam et al.^{15,19}

Mesh fixation is a crucial step in hernia repair for good outcomes but as far as recurrence factors there can be other factors play a role so in that view it is difficult to decide which suture material is best. In recent decades,

other alternatives like glues, staples, and tackers are also available for fixations with good outcome.²⁰

In this study we found no recurrence in both groups and this mean that the use of delayed non-absorbable sutures is a good alternative for the non-absorbable sutures traditionally used for mesh fixation in Lichtenstien repair and their use do not increase chance of recurrence as the short absorbable sutures.²¹

Regarding other postoperative complications, there were no significant differences in seroma, infection, heamatoma, sinus and parasthesia (p value>0.05). However, we noticed a reduction in patients number who complain of infection and then chronic discharging sinus when DN sutures were used. Non absorbable suture material (prolen and nylon) have have indefinite lifetime and hence they harbor infecting microorganisms in the surgical site causing chronic sepsis. For this reason, we use prophylactic antibiotics as routine in aall patients to reduce infection in a site with foreign body implantation (mesh and sutures) inspite of that some studies concluded that no need to use antibiotic as routine and advice it only in high risk patients.²²

Another aspect in this study is the technique used to minimize the chance of nerve entrapment and tissue damage to which the chronic pain and parasthesia were attributed. This includes identification of nerves (ilioinguinal, iliohypogastric andgenetofemoral), air knotting and putting the stitches over the mesh surface and not to the mesh edges. In addition to these measures followed in both groups, we think that the use of absorbable sutures has added to the reduced percentage of complication and then improved quality of life.²³

CONCLUSION

Delayed absorbable sutures are good alternative to non-absorbable sutures for mesh fixation with less complications especially the chronic groin pain and discomfort. They still a good choice in the presence of other materials like glues and tissue sealants when the cost is a concern with a very low rate of recurrence.

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

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