

Research Article

DOI: <http://dx.doi.org/10.18203/2349-2902.ijssurgery20162703>

Comparative study of mesh fixation with non-absorbable v/s delayed absorbable suture in open inguinal hernia

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Received: 08 April 2016

Accepted: 10 May 2016

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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. Traditionally mesh is fixed with non-absorbable suture material. Objective of the study was this study planned with the objective to compare post-operative outcomes of mesh fixation with non-absorbable v/s delayed absorbable suture material.

Methods: This was prospective study conducted at Department of general surgery GMERS medical collage sola, Ahmadabad, Gujarat during the period of January 2013 to May 2014. Total 100 male patients who underwent Lichtenstein tension free inguinal hernioplasty were included in the study. Patients were divided in 2 groups each of 50 patients. In group 1 mesh fixation was done with non-absorbable suture material (proline 1-0) and in group 2 mesh fixation was done with delayed absorbable suture material (vicryl 2-0)..

Results: The development of post-operative pain was more common in in group 1 as compared to group 2. If we compare 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 there was no statistical significant difference was found between two groups. 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. Recurrence of hernia was observed in 2 patients in group 1 while in 1 patient in group 2 without statistical significant difference (p-value: 0.56).

Conclusions: By using delayed absorbable material with Air knot in mesh fixation for Lichtenstein open inguinal hernioplasty we found there is less postoperative groin pain and paraesthesia, with regards to recurrence there is no significant statistical difference in both groups therefore delayed absorbable suture material can be used safely for mesh fixation.

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

INTRODUCTION

Inguinal hernia is an abnormal protrusion of whole or the part of a viscous in abnormal opening in its containing cavity. It is common complaint in patients attending surgical OPD.¹ Inguinal hernia is more commonly found in elderly male. 2/3 of patients having indirect and 1/3 of patients having direct hernia while 10% of patients are having bilateral inguinal hernia.² The repair of this hernia is one of the most commonly performed surgical procedures in the world. Most surgeons now prefer to

perform a tension-free mesh repair.³ The Lichtenstein tension-free hernioplasty has now become dominant method of surgical choice worldwide.⁴

With the advancement in operative technologies like laparoscopic hernia repair, new methods of mesh fixation have been introduced. There are different types of suture materials used for hernia repair like from simple non-absorbable sutures to absorbable screw-type fasteners.⁵ They are still currently used by many surgeons for open and laparoscopic repairs. Most important aspect of

surgery is mesh fixation, according to beginners it should be done with non-absorbable suture material but in recent trends mesh fixation is tried with delayed absorbable materials, staples, glues etc. with good postoperative outcomes in terms of low post-operative pain, paraesthesia without significant risk of reoperations.⁶ 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. Since traditionally mesh is fixed with non-absorbable suture material, so this study planned with the objective to compare post-operative outcomes of mesh fixation with non-absorbable v/s delayed absorbable suture material.

METHODS

This was prospective study conducted at Department of general surgery GMERS medical collage sola, Ahmadabad, Gujarat during the period of January 2013 to May 2014. Prior approval of local ethical committee was obtained. Total 100 male patients who underwent Lichtenstein tension free inguinal hernioplasty were included in the study. The patients, who have filled the following criteria were recruited in the present study.

Inclusion criteria: (i) Unilateral or bilateral hernia; (ii) Elective surgery performed; and (iii) Primary hernia repair

Exclusion criteria: (i) Age < 18 years; (ii) Obstructed/strangulated inguinal hernias; (iii) Emergency repair; and (iv) Recurrent hernia;

Patients were divided in 2 groups each of 50 patients. In group 1 mesh fixation was done with non-absorbable suture material (proline 1-0) and in group 2 mesh fixation was done with delayed absorbable suture material (vicryl 2-0). All patients were analyzed according to age, type, location and site of hernia, Post-operative complications, hospital stay, and recurrence rates. Mesh used for surgery was polypropylene. Follow up data were obtained after 10 days, 1 month, 3 months and one year for pain in groin, paresthesia, seroma, hematoma, infections, recurrence rate etc.

Statistical analysis

Data were presented as frequencies and percentages. Chi square test was used to analyze the association between the variables. p value less than 0.05 was considered significant.

RESULTS

Present study includes total 100 number of male patients, in group 1 mesh fixation was done with non-absorbable suture material (proline 1-0) and in group 2 mesh fixation was done with delayed absorbable material (vicryl 2-0). In group 1, the patients' age was ranges between 18- 74 years with mean age of 54 years while the range of age was 20-71 years mean age of 52 years in group 2. In group 1, 21 patients having right and 15 patients have left, and 14 patients have bilateral hernias while in group 2 there were 25 patients having right, 13 patients have left, and 13 patients have bilateral inguinal hernias.

Table 1: Post-operative pain in both groups (n = 50 in each group).

Time period	Post-operative pain			
	Group 1 N (%)	Group 2 N (%)	Chi-square	p-value
After 10 days	18 (36)	12 (24)	1.71	0.19
After 1 month	12 (24)	4 (8)	4.76	0.02*
After 3 months	5 (10)	2 (4)	1.38	0.23

*p-value <0.05: significant

Table 2: Post-operative paraesthesia in both groups (n = 50 in each group).

Time period	Post-operative paraesthesia			
	Group 1 N (%)	Group 2 N (%)	Chi-square	p-value
After 10 days	12 (24)	6 (12)	2.44	0.11
After 1 month	7 (14)	4 (8)	0.92	0.33
After 3 months	4 (8)	2 (4)	0.71	0.40

There was appearance of post-operative pain in 18 patients, 12 patients, and 5 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 (Table 1).

If we compare 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 there was no statistical

significant difference was found between two groups (Table 2). Similar type of pattern has been observed in development of post-operative complications in both groups. 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 (Table 3).

Table 3: Post-operative complications in both groups (N = 50 in each group).

Complications	Group 1 N (%)	Group 2 N (%)	Chi-square	p-value
Scrotal hematoma	7 (14)	6 (12)	0.09	0.77
Seroma	4 (8)	5 (10)	0.12	0.73
Ecchymosis	2 (4)	4 (8)	0.71	0.40
Wound infection	0	0	-	-

Recurrence of hernia was observed in 2 patients in group 1 while in 1 patient in group 2 without statistical significant difference (p-value: 0.56). Average hospital stay was observed 4 days in both groups.

DISCUSSION

In present study we have tried to compare the outcome of mesh fixation with non-absorbable v/s delayed absorbable suture material in open Lichtenstein tension free inguinal hernioplasty.

In present study, we have found more development of post-operative pain in group 1 as compared to group 2 at different time interval. Similar findings has been observed in a study done by Bharatam KK.⁷ Postoperative chronic pain has become one of the most important primary endpoints in hernia surgery. There are different studies which suggest the incidence of pain ranged from 0% to more than 30%.⁵ The causation behind the pain may be entrapment of a nerve by suture or mesh. This can be avoided by identifying the groin nerves or by using fibrin or biologic glues may be used instead of sutures to secure the mesh.⁵ Regarding the development of post-operative paresthesia, there was more development of paresthesia in group 1 as compared to group 2 at different time interval in the present study. The important reason behind the development of paresthesia is again entrapment of a nerve by suture or mesh. There is low rate of post-operative groin pain, and groin discomfort in delayed absorbable suture material using air knot technique.⁶

In the present study, recurrence of hernia was observed in 2 patients in group 1 while in 1 patient in group 2. There is no significant difference in recurrence rates and other post-operative complications between both groups. The recurrence rate for Lichtenstein hernioplasty at specialist clinics in the United States is consistently less than 1%.⁸

Recurrences may be due to improper execution of the operative technique.

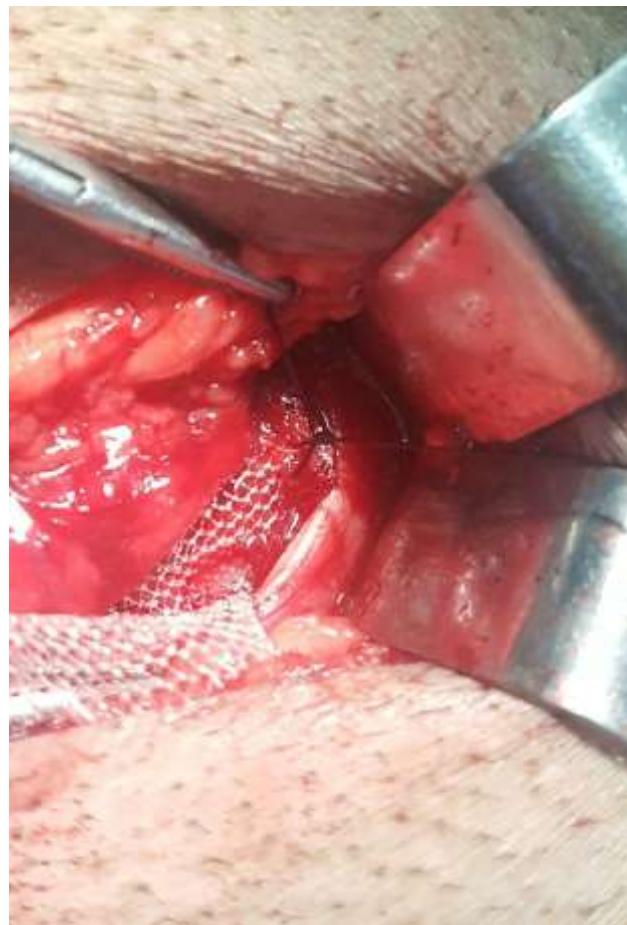


Figure 1: Mesh fixation by using delayed absorbable suture material using air knot.

Fixation with delayed absorbable suture material is not inferior to non-absorbable suture material. There is no

significant difference in recurrence rates and post-operative complications. 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 results.⁶

CONCLUSION

In Lichtenstein tension free open inguinal hernioplasty mesh fixation with delayed absorbable suture material (vicryl 2-0) is simple safe and effective alternative. With compared to traditional method of fixation with non-absorbable suture fixation with air knot there is less chances of chronic groin pain and paresthesia due to less nerve compression. There is no statistical difference in recurrence rates in both techniques. Therefore, delayed absorbable material can be a good alternative for mesh fixation.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Kharadi A, Shah V. Comparative study of mesh fixation with non-absorbable v/s delayed absorbable suture in open inguinal hernia. *Int Surg J* 2016;3:1180-3.