Original Research Article

A Hospital Based Randomized Prospective Control Study to Compare the Prolene v/s Polyglactin Sutures (Vicryl) for Mesh Fixation in Assessing Postoperative Chronic Pain Using VAS in Inguinal Hernia Repair

Shiv Shankar Mangal[1], Ashish Sharma[2*]

[1]Senior Specialist, Department of General Surgery, District Hospital, Dholpur, Rajasthan, India
[2]Junior Specialist, Department of General Surgery, District Hospital, Dholpur, Rajasthan, India

Received: 03-11-2021 / Revised: 24-12-2021 / Accepted: 10-01-2022

Abstract

Background: Inguinal Hernia is one of the most common general surgical problems. Pain could be related to nerve mangling while operating. The aim of this study to compare the prolene v/s polyglactin sutures (Vicryl) for mesh fixation in assessing postoperative chronic pain using VAS in inguinal hernia repair. **Materials & Methods:** A hospital based prospective study done on 50 patients undergoing Lichtenstein's repair in department of surgery at District hospital, Dholpur, Rajasthan, India during one year period. The patients were divided into two groups of 25 each as follows: patients undergoing mesh fixation with polyglactin as suture material in Lichtenstein mesh repair formed group A (study group). Patients undergoing mesh fixation with polypropylene suture material in Lichtenstein mesh repair formed group B (control group). All the patients were assessed for post-operative on the post-operative day 1, 3, 7 and also after 3 months. To grade the pain we used visual analogue score ranging from 0 to 10 considering 0 as no pain and 10 as severe pain. The categorical data were expressed as rates, ratios and percentages and comparison was carried out with chi–square tests, Continuous data were expressed as mean±standard deviation. A p-value of less than or equal to 0.05 was considered as statistically significant. **Results:** Our analysis showed that the incidence of postoperative groin pain at postoperative day 1, 3 in both groups were similar and statistically not significant whereas the 1 week and 3 months follow up in group A and B respectively, were significant ($p<0.05$). **Conclusion:** We concluded that; using polyglactin suture material to fix mesh is a safe, simple as well as and effective alternative to the conventional usage of polypropylene sutures for fixing the mesh in Lichtenstein hernia repair.

Keywords: Inguinal Hernia, Sutures, Prolene Suture, Polyglactin Suture, Pain.

Introduction

Inguinal Hernia is one of the most common general surgical problems. It constitutes 75% all abdominal wall hernias.[1] The male: female ratio is 7:1. Right side representation is more common than left side. Indirect type of hernia is more common than the direct in the ratio of 2:1.Congenital inguinal hernia is common in low birth weight individual with preponderance to right side. For an adult male the incidence increases steadily with age and has been reported to approach 50% over the age of 75[1].The treatment for Inguinal Hernia has been constantly evolving starting from the earliest surgery through scrotal incision to the present day laparoscopic preperitoneal mesh repair. Inguinal hernia repair accounts for 10 to 15% of all surgeries, the 2nd most frequently done surgical procedure[2].

Pain could be related to nerve mangling while operating. Mesh repair can lead to an inflammatory reaction over a period of time, though it still needs groundwork to find out exact cause of pain[3].The mesh is usually secured to the surrounding tissue by non-absorbable or absorbable sutures. The possible influence of different suture materials on chronic groin pain after inguinal hernia repair has not been studied in depth[4].

Hernias can be defined as a "protrusion of a viscus or part of the viscus through an abnormal opening in the walls of its containing cavity"[5]. Inguinal hernias can be congenital or acquired, and the latter is common. The aim of this study to compared the prolene v/s polyglactin sutures (Vicryl) for mesh fixation in assessing postoperative chronic pain using VAS in inguinal hernia repair.

*Correspondence
Ashish Sharma
Junior Specialist, Department of General Surgery, District Hospital, Dholpur, Rajasthan, India.
E-mail: blessings1504@gmail.com

Materials & Methods

A hospital-based prospective study done on 50 patients undergoing Lichtenstein's repair in department of surgery at District hospital, Dholpur, Rajasthan, India during one year period.

Inclusion Criteria

- Age group between 18-70 years
- Unilateral/bilateral inguinal hernia
- Primary inguinal hernia
- Uncomplicated hernia.

Exclusion Criteria

- Irreducible hernias
- Patients with bleeding disorders
- Patients on anticoagulant treatment
- Pregnancy
- Patients needing emergency repair
- HIV and HbsAg positive patients.

Methods

The patients were divided into two groups of 25 each as follows: patients undergoing mesh fixation with polyglactin as suture material in Lichtenstein mesh repair formed group A (study group). Patients undergoing mesh fixation with polypropylene suture material in Lichtenstein mesh repair formed group B (control group).

Surgical Technique

The surgery was performed under spinal anesthesia. The skin and subcutaneous tissue (Camper's and Scarpa's fascia) was incised. The external oblique aponeurosis was opened. The cord was identified. The ilioinguinal nerve was identified. The direct inguinal hernial sac was reduced back without opening it. The indirect ones were divided, transfixed and excised. Then behind the cord, a polypropylene mesh was placed over the posterior wall. The mesh was fixed in an interrupted fashion to the conjoint tendon and inguinal ligament with

the first stitch being taken 1 cm lateral to the pubic tubercle in order to prevent periostitis. Mesh was fixed using vicryl 2-0 for one set of patients (group A) and prolene 2- 0 for another set of patients (group B). The external oblique aponeurosis and subcutaneous tissues were approximated by continuous absorbable sutures. Skin closure was done by non-absorbable sutures.

Post operatively patients of both the groups were given the same analgesics that is, Injection paracetamol 1 gm i.v. 12th hourly. Later oral paracetamol 650 mg was given as per requirement.

Outcomes

All the patients were assessed for post-operative on the post-operative day 1, 3, 7 and also after 3 months. To grade the pain we used visual analogue score ranging from 0 to 10 considering 0 as no pain and 10 as severe pain. Chronic pain was defined as a pain persisting beyond the normal tissue-healing time (assumed to be 3 months) according to the International Association for the Study of Pain[6].

Statistical Analysis

The categorical data was expressed as rates, ratios and percentages and comparison was carried out with chi–square tests, Continuous data was expressed as mean±standard deviation. A 'p' value of less than or equal to 0.05 was considered as statistically significant.

Results

Our study showed that the mean age in group A was 52.57±19.17 years compared to 49.12±19.36 years in group B, the youngest patient being 20 years of age. Majority of the patients were of male gender.

In the present study, out of total of 25 patients in each group, in which, 56% have mild pain and 44% have moderate pain in post op pain at day 1 in prolene group as compared to 64% have mild pain and 36% have moderate pain in post op pain at day 1 in vicryl group (Table 1). The difference or association is found as statistically not significant at 5% level of significance.

In the present study, out of total of 25 patients in each group, in which, 48% have mild pain and 40.00% have moderate pain in post op pain at day 3 in prolene group as compared to 60.00% have mild pain and 40.00% have moderate pain in post op pain at day 3 in vicryl group (Table 2). The difference or association was found as statistically not significant at 5% level of significance.

In the present study, out of total of 25 patients in each group, in which, 44% have mild pain, 52% have moderate pain, but 4% have no pain after 1 week in prolene group as compared to 66% have mild pain, 20.00% have moderate pain, but 16% have no pain after 1 week in vicryl group (Table 3). The difference or association is found as statistically significant at 5% level of significance.

In the present study, out of total of 25 patients in each group, in which, 32% have mild pain, 48% have moderate pain, but 20% have no pain after 3 months in prolene group as compared to 56% have mild pain, 12% have moderate pain, but 32% have no pain after 3 month in vicryl group (Table 4). The difference or association is found as statistically significant at 5% level of significance.

Table 1: Post-op pain at day 1

Post op pain at day 1	Group A (vicryl group)	Group B (prolene group)	Total	P-value
Mild pain	16 (64%)	14 (56%)	30 (60%)	>0.05
Moderate pain	9 (36%)	11 (44%)	20 (40%)	
Sever pain	0 (0%)	0 (0%)	0 (0%)	
Total	25 (100%)	25 (100%)	50 (100%)	

Chi-square test

Table 2: Post op pain at day 3

Post op pain at day 3	Group A (vicryl group)	Group B (prolene group)	Total	P-value
No	0 (0%)	1 (4%)	1 (2%)	>0.05
Mild pain	15 (60%)	12 (48%)	27 (54%)	
Moderate pain	10 (40%)	10 (40%)	20 (40%)	
Sever pain	0 (0%)	2 (8%)	2 (4%)	
Total	25 (100%)	25 (100%)	50 (100%)	

Chi-square test

Table 3: Post op pain at day 7

Post op pain at day 7	Group A (vicryl group)	Group B (prolene group)	Total	P-value
No	4 (16%)	1 (4%)	5 (10%)	<0.05*
Mild pain	16 (64%)	11 (44%)	27 (54%)	
Moderate pain	5 (20%)	13 (52%)	18 (36%)	
Sever pain	0 (0%)	0 (0%)	0 (0%)	
Total	25 (100%)	25 (100%)	50 (100%)	

Chi-square test

Table 4: Post op pain after 3 months

Post op pain after 3 month	Group A (vicryl group)	Group B (prolene group)	Total	P-value
No	8 (32%)	5 (20%)	13 (26%)	<0.05*
Mild pain	14 (56%)	8 (32%)	22 (44%)	
Moderate pain	3 (12%)	12 (48%)	15 (30%)	
Sever pain	0 (0%)	0 (0%)	0 (0%)	
Total	25 (100%)	25 (100%)	50 (100%)	

Chi-square test

Discussion

Groin hernias may present as a heaviness or discomfort in the groin region, or a visible or palpable bulge. Discomfort is usually most pronounced when intra-abdominal pressure is increased, for example with heavy lifting, straining or prolonged standing. Risk factors for groin hernias include history of hernia or prior hernia repair, older age, male sex, chronic cough, chronic constipation, abdominal wall injury, smoking and family history of hernia[7].

Chronic pain in the groin is a notable problem post lichtenstien's repair, even though the pain is usually mild, studies have revealed that irrespective of the severity, chronic pain may considerably hamper day to day activity.10 Chronic pain is the principle issue linked with the Lichtenstein technique with a conclusive rate between 15% and 40%[7]

There have been many theories regarding the causes for the groin pain and one plausible theory is pain after surgery persists for a long

period due to is inflammatory changes, fibrosis, subsequently entrapment of nerve, induced either by mesh or suture material, that's in proximity of ilioinguinal nerve[8].

Apart from this untimely mangling to nerve at the time of dissection may contribute as well to this. Vicryl (polyglactin) is a synthetic, absorbable, braided suture which can sustain its tensile strength for nearly 3 to 4 weeks in tissues. It's entirely absorbed by hydrolysis within 60 days[9,10].

In a single-blind randomized clinical trial comparing absorbable (ABS) with non-absorbable (NAMS) suture material in 200 patients undergoing tension-free inguinal hernia repair study by Igor Jeroukhimov et al in 2008, it was found that the incidence of severe pain after 1 week of surgery was more in the NAMS group as compared with ABS group (14 versus 5 patients, p=0.026)[4].

Paajanen study demonstrated that in 168 patients who underwent Lichtenstein hernia repair with a two-year follow-up, absorbable sutures (Dexon 2.0) were used to fix the mesh in 84 of them[11]. They deduced that there wasn't any difference in incidence of chronic groin pain when using these sutures. Thus, our study has shown the presence of chronic pain in the groin is quite less in group A (fixing the mesh with polyglactin sutures) compared to group B (fixing the mesh with polypropylene sutures) and statistically significant ($p<0.05$).

Conclusion

We concluded that, using polyglactin suture material to fix mesh is a safe, simple as well as an effective alternative to the conventional usage of polypropylene sutures for fixing the mesh in Lichtenstein hernia repair.

References

1. Collins D. Bailey. Love's Short Practice of Surgery. 25th edn. N. S. Williams, C. J. K. Bulstrode and P. R. O'Connell (eds) 283 × 225 mm. Pp. 1514. Illustrated, 2008.
2. Rutkow I. Demographic and socioeconomic aspects of hernia repair in the United States in 2003. Surg Clin North Am. 2003; 83(5):1045-51.
3. Jeroukhimov I, Wiser I, Karasic E, Nesterenko V, Poluksht N, Lavy R et al. Reduced postoperative chronic pain after tension-free inguinal hernia repair using absorbable sutures: a single-blind randomized clinical trial. J Am Coll Surg. 2014; 218(1):102-7.
4. Perkins F, Kehlet H. Chronic pain as an outcome of surgery. Anesthesiology. 2000; 93(4):1123-33.
5. Bay-Nielsen M, Perkins F, Kehlet H. Pain and Functional impairment 1 year after inguinal herniorrhaphy: a nationwide questionnaire study. Ann Surg. 2001; 233(1):1-7.
6. Kumar DPM, Sukriya DM. Role of ilioinguinal neurectomy in entrapment syndrome in inguinal hernia repair in tertiary care hospital. Indian J Appl Res, 2019;9(3):1.
7. Aasvang E, Kehlet H. Surgical management of chronic pain after inguinal hernia repair. Br J Surg. 2005; 92(7):795-801.
8. Lau WY. History of treatment of groin hernia. World J Surg. 2002; 26(6):748-59.
9. Negro P, Gossetti F, Ceci F, D'Amore L. Made in Italy for hernia: the Italian history of groin hernia repair. Ann Ital Chir. 2016; 87:118-28.
10. 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(3):1180-3.
11. Paajanen H, Kössi J, Silvasti S, Hulmi T, Hakala T. Randomized clinical trial of tissue glue versus absorbable sutures for mesh fixation in local anaesthetic Lichtenstein hernia repair. Br J Surg. 2011; 98(9):1245-51.

Conflict of Interest: Nil
Source of support: Nil