

Surgical Outcomes from Lichtenstein Inguinal Hernioplasty using Polypropylene Suture Vs Skin Staples for Mesh Fixation

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ABSTRACT

Objective: To compare surgical outcome of polypropylene suture and skin staples for securing mesh in Lichtenstein Inguinal Hernioplasty

Methodology: There were a total of two hundred people with an inguinal hernia who were involved in the study. They were randomly randomized to receive either polypropylene mesh or staples. Each patient voluntarily undergoes a Lichtenstein tension-free inguinal hernioplasty at the THQ Kherpur operating room. This procedure is performed under spinal anesthesia, and rigorous hygiene standards are adhered to throughout the procedure. In Group A, the anchorage of the mesh was conducted using 2/0 polypropylene suture, whereas in Group B, the anchorage of the mesh was accomplished using skin staples. Both methods were successful in achieving the desired results. The operating time, total surgical time, and wound infection rates were all compared between the groups.

Results: The common age in cases of Group-X 36.52+9.41 years, and 38.63+8.76 years in Group B cases. Mean postoperative pain was 2.16+1.98 in Group-X and 1.46+1.24 in Group-Y, both of which had p values of 0.0001. Mean postoperative duration in Group-X was 56.7+5.47 and 48.54+4.38 in Group-Y, both of which had p values of 0.0001. The percentage of patients who had a post-operative wound infection was reported as 22 (22%) in Group-X and 6 (6% in Group-Y), whereas 78 (78%) in Group-X and 94 (94%) in Group-Y did not develop an infection; the p value for this comparison was 0.0011.

Conclusion: When performing a Lichtenstein inguinal hernioplasty, anchoring the mesh with skin staples rather than polypropylene suture results in a reduction in both the average amount of time needed for the operation as well as the amount of postoperative pain experienced by the patient.

Keywords: Inguinal Hernioplasty, skin staples, polypropylene suture, outcome

INTRODUCTION

By definition, a hernia occurs when a gastrointestinal (GI) tract organ or portion of a GI tract organ protrudes through an irregular hole in the wall of its enclosing cavity. An inguinal hernia estimated 20 times more prevalent in male subjects than in females and accounts for 73% of all external hernias. When possible, a hernia should be surgically repaired to avoid further health issues.¹ According to estimates, 3 to 6 percent of women and 27 to 43 percent of men may develop groin hernias throughout their lifetimes, respectively.² With 1.6 million diagnoses per year and 500,000 operative repairs, groin hernias are the most prevalent surgical ailment seen by primary care practitioners in the United States.³ 20 million groin hernia repairs are carried out yearly across the world,² with inguinal hernia repairs being the most frequent of all abdominal wall hernia procedures.⁴

The notion of "Tension-Free hernioplasty," in which tension in inguinal canal structures dissolves, was championed by French surgeons J. Rives and R. Stoppa. This was the beginning of the hernia treatment revolution, which began with the deployment of this strategy.⁵ For the first time, a polymer mesh was employed during the hernia repair procedure. The peritoneum and the transversalis fascia were separated using this mesh, which was then inserted into the gap. Lichtenstein published the outcomes of a study in which he conducted 3,125 hernioplasties with a polypropylene mesh implanted above the transversalis fascia in 1993. Only four cases of hernia recurrence were observed in the research.⁶

In individuals who have been diagnosed with an inguinal hernia, the application of a mesh made of polypropylene is currently the most effective method for repairing the abdominal wall and restoring its normal function. In addition, as shown in the aforementioned research, the use of polypropylene allografts with broad holes has led to a notable decrease of the local inflammatory process. This was achieved by the usage of the allografts. Polypropylene is now the allograft that is used the most often in the treatment of inguinal hernias. This material has been shown to possess desirable physical, chemical, and biological qualities.⁷ In light of recent developments, a modified hernioplasty

that employs the use of skin staples for the anchoring of mesh is now being tested. If successful, this procedure has the potential to shorten the length of the operation, as well as reducing the risk of post-operative wound infection and post-operative discomfort.

This study's objective is to ascertain whether or not operating time, the occurrence of post-operative wound infections, and post-operative discomfort can be reduced in Lichtenstein inguinal hernioplasty with the use of skin staples to anchor mesh. It's possible that this will have a substantial positive impact for our patients while also reducing the workload for the hospital staff.

METHODOLOGY

Participation in this randomized controlled clinical research was restricted to male patients who were between the ages of 20 and 70, had been diagnosed with a simple direct or indirect inguinal hernia, and were within the age range of 20 to 70 years old. (Reducible, non-tender). Patients who suffered from conditions such as diabetes mellitus, high blood pressure, chronic renal failure, bleeding disorders, immunocompromised patients, recurrent inguinal hernia, or bilateral inguinal hernia were not permitted to participate in the research study. People were regarded to have the condition if they had inguino-scrotal edema and their ASA grade ranged from I to III. Additionally, the edema needed to be able to be lowered with a positive cough impulse. The manner in which the cases would be divided between the two categories of polypropylene and staples was determined with the help of a random number generator. Each individual patient made the decision on their own to have a stress-free Lichtenstein inguinal hernioplasty performed on them in the clean operating room of the THQ hospital in Kherpur. Each patient received spinal anesthesia, and the procedure was carried out in sterile surroundings. In group A, the mesh was stitched to the posterior inguinal wall using 2/0 polypropylene suture, and the skin was closed using subcuticular 2/0 polypropylene suture; both of these sutures were removed on day 7 post-op. In group B, the mesh was stitched to the anterior inguinal wall using 2/0 polypropylene suture, and both of these sutures were removed on day 7 post-op. Suture made of 2/0 polypropylene was used to attach the mesh to

the anterior inguinal wall in group B of the experiment. In group B, the mesh was connected by utilizing skin staples, and the skin was closed by using staples from the same stapler; both of these staples were removed on day 7 following the procedure. The amount of time spent operating, the length of time the operation lasted, the VAS ratings for pain after surgery, and the rates of wound infection were separately documented for each group. Also recorded were the rates of wound infection.

RESULTS

The common age in cases of Group-X 36.52+9.41 years, and 38.63+8.76 years in Group B cases. Mean postoperative pain was 2.16+1.98 in Group-X and 1.46+1.24 in Group-Y, both of which had p values of 0.0001. Mean postoperative duration in Group-X was 56.7+5.47 and 48.54+4.38 in Group-Y, both of which had p values of 0.0001. The percentage of patients who had a post-operative wound infection was reported as 22 (22%) in Group-X and 6 (6% in Group-Y), whereas 78 (78%) in Group-X and 94 (94%) in Group-Y did not develop an infection; the p value for this comparison was 0.0011.

Table 1: Comparison of Outcome

Variables	Group-X (n=100)		Group-Y (n=100)		P value
	Mean	SD	Mean	SD	
Mean operative time	48.54	4.38	39.44	5.68	0.0001
Mean pain	2.16	1.98	1.46	1.24	0.0001

Table 2: Comparison of Post-Operative Wound Infection in Both Groups

Wound infection	Group-X (n=100)		Group-Y (n=100)	
	No. of patients	%	No. of patients	%
Yes	22	22	6	6
No	78	78	94	94
Total	100	100	100	100

P value=0.0011

DISCUSSION

According to the findings of our research, the mean age of those in Group-X was 36.52+9.41 years, while those in Group-Y were 38.63+8.76 years old. Mean postoperative pain was 2.16+1.98 in Group-X and 1.46+1.24 in Group-Y, both of which had p values of 0.0001. Mean postoperative duration in Group-X was 48.54+4.38 and 39.44+5.68 minutes in Group-Y, both of which had p values of 0.0001. The percentage of patients who had a post-operative wound infection was reported as 22 (22%) in Group-X and 6 (6% in Group-Y), whereas 78 (78%) in Group-X and 94 (94%) in Group-Y did not develop an infection; the p value for this comparison was 0.0011.

In a Lichtenstein inguinal hernioplasty study, Awais Ali Khan and his colleagues⁸ examined the use of polypropylene suture and skin staples for fastening mesh. They looked at how long the procedures took on average and how much pain patients had after surgery. When the staples were utilized to secure the mesh, (p = 0.026) in the amount of total postoperative pain. In addition, the duration of the operation was shorter in the staple group (37.42+2.69 minutes) compared to the duration of the operation in the polypropylene group (42.44+2.55 minutes). These findings are in agreement with our results.

In the correction of Lichtenstein hernias, Anand Munghate and his colleagues⁹ examined the amount of time needed for surgery as well as the postoperative outcomes of two different methods for fastening mesh: skin staples and polypropylene sutures. In this particular study, a total of 96 patients with an inguinal hernia who were having Lichtenstein mesh treatment were randomly randomized into two groups. In order to anchor the mesh, either skin staples from group I or polypropylene sutures were used. (group II). Results. The operation time was considerably decreased from mesh insertion to completion of skin closure in group I (mean 20.7 min) as compared to group II (mean 32.7 min), with a significant P value (P 0.0001) and fewer complication rate in group I as compared to group II. This was shown by a significant difference in the mean operating times

between the two groups. We came to the conclusion that mesh fixation with skin staples is just as successful as traditional sutures, with the additional benefit of a large decrease in the amount of time needed for the operation as well as the risk of problems or recurrence. When it comes to repairing the mesh, staples can be inserted much more rapidly than sutures can, which helps to save time during the operation. The risk of infection is dramatically reduced because to the use of staples.

For the purpose of fastening mesh, El Atrebi MA et al. in 2015 revealed that using skin staples resulted in a considerably shorter amount of mean operating time when compared to the usage of polypropylene sutures.(50 min ± 14.4 versus 65 min ± 16.2 ; P value = 0.001).¹⁰ In another study that was conducted in 2014 by Munghate A et al., the researchers discovered that the use of staples resulted in significantly fewer instances of post-operative wound infection than the use of polypropylene sutures did. In the group that received polypropylene sutures, 8% of patients had a stitch abscess, and 12% of patients developed a seroma, while the staples group experienced neither complication. This research demonstrated that the method of fixing mesh with skin staples is just as successful as the traditional method of fixing mesh with polypropylene sutures, but it has one significant benefit over the traditional method: less problems.¹¹

The Lichtenstein tension-free way of mending is a straightforward technique that calls for minimal instruction and proficiency. According to the findings of our study, the use of staples for the purpose of mesh fixation greatly cut the amount of time required for surgical procedures. The use of polypropylene sutures, which is the more prevalent procedure, can achieve the same level of success as the mesh fixation technique. Because it only requires the placement of a skin stapler to accomplish deep tissue penetration and secure mesh fixation, this method is technically more straightforward. The risk of infection is significantly decreased whenever staples are utilized. There is no noticeable difference between the use of staples and sutures in terms of the discomfort or effects that may be experienced after surgery. When contrasted with suture, the utilization of staples results in greater economic viability.

CONCLUSION

When performing a Lichtenstein inguinal hernioplasty, anchoring the mesh with skin staples rather than polypropylene suture results in a reduction in both the average amount of time needed for the operation as well as the amount of postoperative pain experienced by the patient.

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