

Comparison of the Post-Operative Pain of Lichtenstein's Inguinal Hernia Repair by Continuous Suture Versus Interrupted Sutures for Mesh Fixation

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Abstract

Background: Inguinal hernia is a frequent condition commonly treated by surgery with polypropylene meshes. However, mesh fixation hinders patients' quality of life which can be resolved by continuous or interrupted sutures.

Objective: To compare the post-operative pain of Lichtenstein's inguinal hernia by continuous suture approach vs interrupted sutures for mesh fixation.

Study type, settings & duration: This prospective cohort study was conducted in the Department of Surgery, Nishtar Hospital, Multan from March 2021 to March 2022.

Methodology: A total of 60 male patients with indirect inguinal hernia aged from 25 to 65 years old were included in the study. The patients were consecutively divided into two groups with 30 patients each. Group A was treated by continuous suturing and in Group B interrupted suturing was performed. Lichtenstein's inguinal hernia repair was performed in both groups. Outcome (satisfactory/unsatisfactory) was measured at 6-months by visual analogue scale with 0 representing no pain and 10 representing severe pain.

Results: The average age of patients was 41.50 ± 11.67 . The mean VAS score in Group A was 1.13 ± 0.89 and 4.5 ± 1.33 in Group B. The outcome (in terms of no post-operative pain) of continuous suture for mesh fixation versus interrupted suturing was satisfactory in 19 (63.33%) and 5 (16.67%) patients respectively with a p -value of 0.0001.

Conclusion: Minimal postoperative pain was noted in Lichtenstein's inguinal hernia repair patients treated with continuous suturing for mesh fixation as compared to interrupted suturing.

Key words: Hernia repair, inguinal hernia, lichtenstein hernioplasty, mesh fixation, pain.

Introduction

Abdominal wall hernias are a frequent condition with an incidence of 1.7% in children and adults, this prevalence increases to 4% in individuals older than 45 years.¹ Among the abdominal hernias, 75% of patients present with

inguinal hernias which are more common in men with a significantly high lifetime risk (27%) than in women (3%).² These hernias represent a bulge in the groin that can be resolved with minimal pressure or it goes away on its own when the patient lies down. The lump causes little to moderate discomfort which can increase due to movement. If the hernia is not resolved by the methods mentioned above, a hernia repair is recommended.

Inguinal hernia repair is a frequently performed procedure and its methods can vary depending upon the patient. Tension-free repair is a gold standard as it shows excellent results with a low recurrence rate of 1-3%.³ Prosthetic mesh contributes to low recurrence in the open anterior repair.⁴ Total extraperitoneal repair when using the laparoscopic approach is preferred over the trans-abdominal approach due to reduced complications and risks.⁵

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Authors Contribution

SUH conceptualized the project and did the literature search. did MA & SA did the data collection. MA performed the statistical analysis. Drafting, revision & writing of manuscript were done by SA.

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Surgery is performed if the condition does not resolve on its own or the hernia cannot be pushed into the abdomen. Polypropylene meshes are commonly used in the hernia repair. However, it can cause inflammation due to being a foreign body, the severity of response depending upon nature and amount of material used.⁶ Post-operatively patients experience pain at the surgery site due to use of non-absorbable prolene mesh which is resolved by interrupted prolene suturing which reduces movement in the abdominal wall leading to severe pain.⁷

Patients commonly complain of post-operative pain after inguinal hernia repair which hinders their normal physical activities and increases the risk of morbidity. Previous studies have shown continuous suturing as the better option for reducing post-operative pain⁸ but no stats were available locally. We conducted this study to compare the post-operative pain of Lichtenstein's inguinal hernia by continuous suture approach vs interrupted sutures for mesh fixation.

Methodology

This prospective cohort study was conducted in the Department of Surgery, Nishtar Hospital, Multan from March 2021 to March 2022. A total of 60 male patients with indirect inguinal hernia aged from 25 to 65 years old were included in the study by non-probability consecutive sampling. Patients reporting hernia recurrence or patients with complicated hernias including obstructed, irreducible, or strangulated hernias were excluded. All patients provided informed consent for their data being used for research.

Patients' demographic data including anthropometric measurements, duration of disease, and place of residence were noted. The patients were consecutively divided into two groups with 30 patients each. Group A was treated by continuous suturing and in Group B interrupted suturing was performed. Lichtenstein's inguinal hernia repair was performed in both groups by a consultant surgeon with at least 3-year post-fellowship experience. All patients in both groups were given tab diclofenac sodium twice daily for 3 weeks. All the patients were assessed for post-operative pain at 6 months by a consultant surgeon blinded to surgery outcome. Outcome (satisfactory/ unsatisfactory) was measured by visual analogue scale with 0 representing no pain and 10 representing severe pain. Satisfactory outcome was denoted by 0-5 VAS score and 5-10 score represented unsatisfactory.

SPSS 20 was used for data analysis. Age, duration of disease, height, weight, BMI, and VAS score were presented by mean $\pm$ SD. Place of residence (rural/urban) and outcome (satisfactory/unsatisfactory) were shown by percentage. The chi-square test was used to compare the outcome in both groups and a p-value ≤ 0.05 was considered significant. Stratification was done for age, duration of disease, BMI, and place of residence. The Chi-square test was performed post-stratification to record their association with the outcome.

The ethical approval was obtained from the Ethical Review Committee of Nishtar Medical University, Multan vide letter no. 14-114.

Results

The average age of patients was 41.50 ± 11.67 years with older patients in Group B (42.70 ± 12.15) than in Group A (40.0 ± 11.04). Thirty-nine patients (65%) were younger than 46 years. The disease lasted at an average of 11.87 ± 4.28 months. The mean BMI (kg/m^2) was 29.65 ± 4.32 and 29.22 ± 4.14 , respectively. 39 (65%) belonged to rural areas and 21 (35%) lived in urban settings (Table-1).

Table 1: Patients' demographics.

Demographic Characteristics		Group A (n=30)	Group B (n=30)
Age	Mean	40.0 ± 11.04	42.70 ± 12.15
	25-45 years	21 (70%)	18 (60%)
	46-65 years	9 (30%)	12 (40%)
Duration of disease (months)	Mean	11.77 ± 4.42	12.03 ± 4.19
	≤ 12 months	19 (63.3%)	17 (56.7%)
	> 12 months	11 (36.7%)	13 (43.3%)
BMI (kg/m^2)	Mean BMI	29.65 ± 4.32	29.22 ± 4.14
	≤ 30	16 (53.3%)	15 (50%)
	> 30	14 (46.7%)	15 (50%)
Ethnicity	Rural	19 (63.3%)	20 (66.7%)
	Urban	11 (36.7%)	10 (33.3%)

Table 2: Comparison of patients' Outcomes.

Outcome	Group A (n=30) N (%)	Group B (n=30) N (%)
Mean VAS score	1.13 ± 0.89	4.5 ± 1.33
Satisfactory	19 (63.3%)	5 (16.7%)
Unsatisfactory	11 (36.7%)	25 (83.3%)

The mean VAS score in Group A was 1.13 ± 0.89 and 4.5 ± 1.33 in Group B. The outcome (in terms of no post-operative pain) of continuous suture for mesh fixation versus interrupted suturing

Table 3: Stratification of patients according to age, duration of disease, BMI and place of residence.

Factors		Group A (n=30)		Group B (n=30)		p-value
		Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory	
Age	25-45	15	6	2	16	0.0001
	46-65	4	5	3	9	0.350
Duration of disease	≤12 months	11	8	4	13	0.037
	>12 months	8	3	1	12	0.001
BMI (kg/m2)	≤30	9	7	1	14	0.003
	>30	10	4	4	11	0.016
Ethnicity	Rural	13	6	2	18	0.001
	Urban	6	5	3	7	0.142

was satisfactory in 19 (63.33%) and 5 (16.67%) patients respectively with a *p*-value of 0.0001 as shown in Table-2. Stratification of outcome with respect to age groups, duration of disease, BMI, and place of residence is shown in Table-3.

Discussion

Lichtenstein hernia repair is frequently used for treating inguinal hernia, first described in 1989. Lichtenstein hernia repair has reported a reduced recurrence rate and is performed by administering local anesthesia.⁹ One of the most annoying complications of post hernia repair is the chronic groin pain that may compromise a patient's quality of life.¹⁰

Methods to avoid or decrease postoperative pain include the selection of patients, technique of repair, mesh material, and type of fixation, avoiding hip pathology or back disease with unusual preoperative inguinal pain in case of hidden hernia. Regarding the technique of repair, preperitoneal mesh placement has a low incidence of pain.¹¹ Moreover, identifying the pain nerves in the groin, ilioinguinal, iliohypogastric, and genitofemoral nerve, helps to decrease nerve injury. Lightweight mesh with wide pore and reduction in polypropylene volume reduces post-operative pain and inflammation response.¹² The method of fixation of mesh plays a significant role in postoperative neuralgia as previous randomized controlled trials reported that a reduced complaint of postoperative neuralgia was reported by the use of fibrin sealant than when suturing or staple fixation was employed with the same recurrence rates.¹³

We conducted this study to compare the postoperative pain of Lichtenstein's inguinal hernia repair by continuous sutures versus interrupted sutures for mesh fixation. Patients aged from 25 to 65 years with an average age of 41.50±11.67 years. The satisfactory outcome (in terms of no post-operative pain) of continuous suture for mesh fixation versus interrupted suturing was in 19 (63.33%) patients in Group A and 5 (16.67%)

patients in Group B (*p*=0.0001). A similar outcome was reported by a previous study in which a satisfactory outcome (no pain) was found in 72.3% of patients with Lichtenstein's inguinal hernia repair by continuous suture as compared to 26.3% in patients with interrupted suturing of mesh.¹⁴

Saini et al. also reported that the patients treated by continuous sutures vs interrupted sutures in Lichtenstein hernia repair did not differ in terms of postoperative pain.¹⁵ Zhi et al.¹⁶ and Yildirim et al.¹⁷ concluded the same results. The reason for reduced post-operative pain can be a reduction in knots as it decreases nerve irritation.¹⁸ A fewer number of knots are tied in continuous suturing and multiple knots are tied in interrupted sutures. Irritation of nerve fibers, specifically of the ileoinguinal nerve occurs by the cut ends of the prolene sutures in interrupted sutures, causing pain.

There are some limitations of our study. The study population was small and was followed up for a short period of 6 months. Longer, multicenter studies are needed to elucidate the exact incidence of post-operative pain after these suturing techniques.

Minimal postoperative pain was noted in Lichtenstein's inguinal hernia repair patients treated with continuous suturing for mesh fixation as compared to interrupted suturing.

Conflict of interest: None declared.

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