

ORIGINAL ARTICLE

Comparison between Mesh Hernioplasty and Nylon Darn Repair in Inguinal Hernia Surgery; A Randomized Controlled Trial

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ABSTRACT

Background: One of the procedures that is conducted the most frequently worldwide is inguinal hernia surgery. Several methods have been developed over time, but Lichtenstein has long dominated all others. This is said to lead to a less painful procedure and less suture tearing out, which lowers the likelihood of recurrence. Because to the paucity and high cost of commercial prosthetic mesh, conventional Bassini operations are still carried out at hospitals with minimal resources in developing nations. Because sutured material for darn repair is readily available, has a little amount of reactivity, and has acceptable recurrence rates, we compared it to Lichtenstein in this study. Inguinal hernia recurrence rates following non-mesh surgery range from 0.1 to 1%.

Aim: This study is set out to compare darning with Lichtenstein technique of inguinal hernia repair in terms of frequency of post-operative complications, recovery and cost.

Study Design: Prospective Randomized Control Trial

Place and Duration of Study: This study was done in department of General surgery at Central Park Teaching Hospital, Lahore during a period of 4 months that span from October 2021 till January 2022.

Methodology: Using a continuous simple random selection, 100 male patients between the ages of 20 and 80 who had been clinically diagnosed with an uncomplicated direct or indirect inguinal hernia were divided into two groups using a lottery system. This prospective randomised control trial included Group A, who underwent Darn Repair, and Group B, which underwent Open Mesh/Lichtenstein repair on the elective list (RCT). With follow-up at one week, six weeks, and one year, the primary end point compared the operating time, post-operative pain, analgesic requirement in the first 24 hours, length of hospital stay, time until return to work, surgical site infection, and hernia recurrence between patients who had Darning Repair (group A) and patients who had LMH (group B).

Results: In group A, the average operation time and hospital stay following surgery were less. Early postoperative complication rates and the period before returning to work were comparable in both groups. The required length of analgesia was identical as were the pain scores at 24, 48, and 72 hours. Return to regular activity took an average of 5 weeks for each group, which was also comparable. During the 1-year assessment, the recurrence rates in the two groups were similar, at 4% after mesh repair and 4% following darn repair.

Practical Implication: This will help in early and prompt management and repair of hernia even at smaller setups as nylon repair is as good as polypropylene mesh repair.

Conclusion: Open inguinal hernia repair with a nylon darn was equal to polypropylene mesh with respect to early assessments of postoperative outcome and recurrence at 1 year. When compared to the Lichtenstein approach in individuals with inguinal hernias, the darn repair technique is straightforward, secure, affordable, and has a similar risk of recurrence.

Keywords: Inguinal hernia, Lichtenstein Mesh Repair, Open Darn repair, recurrence rate.

INTRODUCTION

Congenital or acquired, inguinal hernias continue to be the most frequent kind, with prevalence rates in males and females of 25% and 2%, respectively.¹ According to the literature, 80% of hernias are inguinal and 92% of them affect men. Of these, 18% occur in children under the age of 15, and inguinal hernias are more common in older men, accounting for 50% of all elderly guys each year. With 600,000 operations carried out each year, inguinal hernia repair is the most frequent surgery in the US.³ With approximately 80 operating techniques published since 1887, this intervention places the greatest strain on the healthcare system, accounting for 10 to 15% of all surgical procedures.^{3,4}

Despite technological breakthroughs over the past few decades, recurrence rates are still above 15%.⁵ Polypropylene meshes are still the gold standard for hernia repair across the world.^{1,4,8} The preferred technique in the majority of affluent nations is presently Lichtenstein repair. Because to the paucity and high cost of commercial prosthetic mesh, conventional Bassini operations are still carried out at hospitals with minimal resources in developing nations.⁹ Lightweight PP meshes minimises the occurrence of persistent groin discomfort as well as the likelihood of acquiring other groin complaints.¹ To avoid issues, it has been recommended to employ absorbable meshes, such as those made

of copolymers of lactic and glycolic acids or lactic acid polymers. This puts the patient at risk for an inevitable hernia recurrence since the implanted prosthetic material is entirely digested by the inflammatory response due to a hydrolytic reaction.^{1,2}

Recurrence rates are said to be fewer than 5/1000 with the invention of surgical repair using prosthetic mesh; repairs reported in 1995 showed recurrence rates as low as 8%.⁵ We compared the Lichtenstein repair to darning repair in this study because sutured material is readily available, there is little reactivity, and the recurrence rates are acceptable. According to Molina et al., who first characterised darning as a low-cost and successful hernia repair method with a recurrence rate of 0.^{4,5} Polypropylene mesh has a recurrence rate of zero in Lichtenstein's perspective.⁶ A lot of research has been done to evaluate the results of inguinal hernia repair. Recurrence rates for inguinal hernias treated without mesh range from 0.2% to 33%, depending on the surgical technique used, the experience of the surgeon, the type of hospital, and the length of the follow-up period. According to several research, mesh repair produces better short-term results than non-mesh repair.¹ Because there is a lack of data, it is impossible to evaluate the long-term effects of mesh repair.¹ Our study compared polypropylene mesh and polypropylene darn, which are frequently used to repair inguinal hernias in men, with an assessment of recurrence at one year.

MATERIALS AND METHODS

100 male patients were chosen in total after ethical committee permission. Their ages ranged from 20 to 80. Hernia is a clinical diagnosis; hence the diagnosis was made using clinical means. Individuals who had ascites, recurrent inguinal hernias, cancer, or gangrenous bowels as the contents of the sac were eliminated. Patients were divided into two groups by lottery after being chosen using a continuous simple random sampling procedure. Between the conjoint tendon and inguinal ligament, Group A underwent Darn Repair using tension-free continuous Prolene (2/0) suture, with apposition between these structures and Group B Open Mesh/Lichtenstein tension-free mesh repair. Synthetic mesh was placed in the posterior wall of the inguinal canal, secured to the boundaries of the defect using proline sutures, and irrigated with saline before closure in layers to provide some tension-free laxity. In this prospective randomised control experiment, every procedure was carried out on the elective list (RCT). Both treatments had problems in the immediate postoperative period (14 days), early postoperative period (6 weeks), and late postoperative period (one year).

Participation was agreed upon by both the surgeon and all males with primary inguinal hernias. Age range of 20 to 60, availability of postoperative care support at home, American Society of Anaesthesiologists grade of 1 or 2, and access to a phone at home to contact medical help if required were the inclusion criteria. The primary objective was to compare the operating times, post-operative pain, the need for analgesics within the first 24 hours, hospital stays, time until return to work, surgical site infections, and hernia recurrence between patients who underwent Darning Repair (group A) and patients who underwent LMH (group B). Patients in this randomised prospective experiment underwent follow-up exams after one week, six weeks, and a year.

RESULTS

Age, BMI, ASA score, comorbidities, forms of inguinal hernias, and other demographic factors (Table 1) Regarding age, BMI, and ASA score, there were no notable variations between the two groups. A almost equal number of patients from each cohort underwent surgery. 50 patients in each group. However, only unilateral repair was performed for the study without lengthening the hospital stay because 95% of the population had a unilateral hernia and 5% had a bilateral one. P=0.35 indicated there is no significant age difference between the two groups. The mean population age in group B was 53+19 range 19+89 years, while it was 56+18 range 18+87 years in group A. Twenty-three direct hernias and twenty-eight indirect hernias, respectively, were corrected using mesh and nylon. Indirect hernias were fixed in twenty-seven cases with mesh and twenty-two cases with darn repair. In the mesh group, there were 36 cases of right-sided hernias, compared to 29 cases in the nylon group. (Table 2)

Table 1: Distribution of inguinal hernia according to age groups

Age Group	Observed Frequency	Expected Frequency
25-34	40	25
35-44	30	25
45-54	20	25
>55	10	25
Total = 100		

Table 2: Distribution of inguinal hernia cases in contingency for type and side

Type	Right Side	Left Side	Total
Direct Hernia	35	16	51
Indirect Hernia	32	17	49
Total	67	33	100

The t test result for equality of means was 0.72. During 24 hours following surgery, the mean pain score for group B was 3.22+0.3 and that for group A was 3.09+0.9. With a p value of less

than 0.5 (P = 0.47), these statistics are relevant. 95% c.i. of the mean is between +0.3-0.9

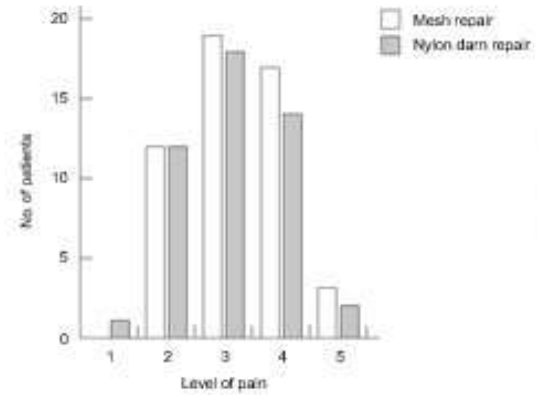


Figure 1: Comparative Assessment of Pain Levels in Mesh v/s Nylon Repair.

81% of patients needed some type of analgesia following mesh repair and 88% after darn repair, with a P value of 0.49 indicating that neither procedure was statistically significant. T test for equality of means 0.13, P = 0.19. 95% c. of the mean 0.83 to 4.18. Patients in group B required oral analgesia for a mean of 5.63+4.11 days compared with 3.96+4.99) days in the group A. Both groups of patients took the same amount of time to resume their regular activities. The median time of return to daily activity for group B was 5.13 weeks, while the median time for group A was 5.13 weeks, according to a test for equality of means with a P value of 0.99 and a 95% confidence interval of +1.63 to +1.61. The frequency of early problems did not statistically differ between the two groups. Compared to 33% for Group A, 28% for group B. P = 0.49. Among group A, two hernias—one at 11 months and one at 8 months—recurred. As far group B, there were two recurrences. (Table 3)

Table 3: Post-op Complications

Complications	Number		%age	
	Group A	Group B	Group A	Group B
Recurrence	2	2	4	4
SSI	1	3	8	6
Hematocoele	3	5	2	10
Total	6	10	14	20

Except for the difficulties mentioned above, all patients were released from the hospital on the fourth post-operative day, with a median hospital stay of three days. Out of 100 individuals who underwent surgery, 16% experienced postoperative problems. Of these, 56.25 percent suffered from an indirect inguinal hernia, 31.25 percent from a direct inguinal hernia, and 12.5% from a Pantaloon hernia. After a year of follow-up, the recurrence rate was equal at 4% for each group.

DISCUSSION

Despite these constantly evolving trends in procedures, surgical skill views tension-free repair as the best course of action.¹ In this regard, thorough study in inguinal surgery has shown that the anterior abdominal wall is weak and deficient, but the fascia transversalis pays the price for dealing with the intra-abdominal pressure that ultimately results in hernia.² This logically requires restoration and posterior wall strengthening.^{1,2} In order to compare the two widely used approaches (Lichtenstein V/S Nylon Darn repair) and share our expertise, this study was designed. In this study, which is comparable to that described in studies from Yemen, We did not find any hematoma or seroma in either group,

but wound infections with prevalence rates of 4.0 and 8.6% for superficial and deep infections in Groups A and B, respectively, were treated with conservative measures and resolved. This may be due to the fact that patients who underwent mesh repair feel more discomfort and pain that lasts longer.^{2,5} We found that there were two recurrences in two separate procedures: two percent in Lichtenstein and two percent in a straightforward Darn repair. These findings line up with other research as well.^{1,4,6,8} Our results are comparable to those of other recent research since this clinical trial's design was logical and well-executed to extract the logical end points between two procedures. According to the trial's preliminary findings, there are no differences between polypropylene mesh repair and nylon darn in terms of early postoperative discomfort, complications, or resumption of normal activities. These results are at odds with earlier randomised studies' conclusions that open mesh repair leads to a quicker return to normal activities and reduced postoperative pain.^{4,8} According to this research's results so far, there is no evidence that mesh repairs are connected to fewer postoperative issues and a lower recurrence rate. In this study, the recovery time for hernias treated with mesh or nylon was the same, taking an average of 5 weeks. Recurrence rates for the Shouldice technique and nylon darn in a randomised experiment were both equal at 4.0% and 1.8%, respectively.^{1,2} Also, the Shouldice treatment recurrence rate in this general surgical practise was higher than the 1.1% reported from the Shouldice Clinic.^{1,3} With two recurrences after each procedure, the present study's 2% recurrence rate is much greater than previous research, but it is still very comparable to findings from research looking at the same thing after 12 months following surgery. At a rate of 10 per 10,000 in the UK each year, inguinal hernia repair is one of the most frequent general surgical procedures.⁹⁻¹⁵ The early measure of postoperative success and recurrence at one year compared polypropylene mesh to open inguinal hernia repair using a nylon darn method.⁸⁻¹¹ The recurrence rate in our study was 2%, and it occurred in an elderly patient with a bilaterally recurrent right inguinal hernia that was repaired with mesh. Thus, it is advised to use proline mesh to treat recurring hernias in older people rather than darning to treat original hernias. Yet, the darning treatment costs about half as much as mesh repair while producing results that are equivalent. Following a year of follow-up for this study.

CONCLUSION

For early assessments of postoperative outcome and recurrence at one year, a nylon darn was comparable to polypropylene mesh. In terms of postoperative recovery, Lichtenstein is preferable to darning, although the occurrence of early postoperative problems is comparable for both methods. The darn repair works just as well, is inexpensive, and is safe. The length of the hospital stay, though. Those who underwent mesh repair had a slightly increased incidence of superficial surgical infections. For primary inguinal hernias, darning treatment is an excellent substitute for the (gold standard) Lichtenstein mesh surgery, particularly in

developing nations. It has few postoperative problems, low recurrence rates, and is inexpensive.

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