

Outcome of non-fixation versus fixation of the mesh in Lichtenstein repair of inguinal hernia

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Abstract

Aim. Although inguinal hernia repair is one of the most frequently performed surgical procedure worldwide, the ideal repair still not accepted yet. Aimed that Lichtenstein hernia repair method, non-fixation technique can be used safely with better results in term of reducing operative time and pain.

Materials and Methods. The study included 85 patients who referred to the surgical outpatient clinic of Tikrit teaching hospital and all of them underwent Lichtenstein hernia repair.

The standard procedure done in 42 patients (group A); while the non-fixation technique used in 43 patients (group B). All patients were followed and examined for pain, scrotal edema, and the presence of seroma in the 7th postoperative day and for paresthesia, neuropraxia, and recurrence in the 6th postoperative month.

Results. Operative time and pain scores in the non-fixation group were significantly lower, the operative time was significantly shorter in group B ($P = 0.001$), and the VAS scale was higher in group A ($P = 0.001$), without any increase in rates of recurrence.

Conclusion. Based on these findings, in Lichtenstein hernia repair method, non-fixation technique can be used safely with better results.

Key words: Lichtenstein repair, inguinal hernia, mesh

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Introduction

Inguinal hernia repair is one of the cornerstones of a general surgery practice and is one of the most commonly performed procedures worldwide, owing to a significant lifetime incidence and variety of successful treatment modalities and vast majority of these procedures were performed on an outpatient basis¹ Advancements in perioperative anesthesia and the increase in proportion of laparoscopic treatment of inguinal hernias have combined to increase the percentage of ambulatory inguinal hernias. A study revealed 89% of the total number of inguinal hernia repairs were performed on an outpatient basis² However, the preponderance of laparoscopic inguinal hernia repair is relatively low (14%) when compared to percentage of open inguinal hernia repair (86%)³ The majority of abdominal wall hernias occur in the groin, totaling approximately 75% of the total incidence. It is difficult to estimate the exact prevalence of inguinal hernias in the population, but an overwhelming majority of inguinal hernias occur in males vs. females.⁴

By demonstrating a comprehensive understanding of inguinal anatomy, Bassini (1844-1924) transformed inguinal hernia repair into a successful venture with minimal morbidity to the patient. His operation involved dissection of the layers of the inguinal canal to the transversalis fascia and

then a reconstruction of the floor of the inguinal canal in several layers. The success of the Bassini repair over any of its predecessors ushered in an era of tissue-based repairs. Modifications of the Bassini repair were manifest in the McVay repair, as well as the Shouldice repair. All three of these techniques are currently practiced: the Shouldice repair, namely at the institution that bears its name (Shouldice Hernia Centre) and the McVay and Bassini in situations when prosthetic materials are contraindicated.⁵

The era of tissue-based repairs was supplanted by tension-free repairs with the widespread acceptance of prosthetic materials for inguinal floor reconstruction. Initially described by Lichtenstein, the repair involved placement of a Marlex mesh over the entire floor of the inguinal canal. The repair capitalized on the concept of the myopectineal orifice of Fruchaud, which was based on the notion that whatever the type of inguinal hernia, the defect lay in the integrity of the transversalis fascia. This was superior to previous tissue-based repairs in that the weakness of the transversalis fascia could be restored by bridging the defect with mesh, rather than placing tension between tissues to close the defect.⁶

Lichtenstein introduced his technique and reported its results including 1000 patients in 1989⁷ Hereafter, Lichtenstein procedure with synthetic mesh became accepted as an ideal

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method for primary inguinal hernias. The aim of our study is to compare the results of the technique with and without mesh-fixation, in terms of operative time, postoperative pain, complications, and recurrence rates.

Materials and Methods

The study included 85 patients who referred to the surgical outpatient clinic of Tikrit teaching hospital diagnosed with inguinal hernia; were evaluated prospectively in our randomized study.

Patients with recurrence, femoral and bilateral hernias, and patients used immunosuppressive medications were excluded from the study. All the patients were informed about the study and informed consent was obtained.

Lichtenstein inguinal hernia repair done for all patients. The standard procedure done for 42 patients (Group A), while the non-fixation technique in which the mesh was fixed only around the inguinal cord at the border of the internal ring with one 2-0 prolene suture; used in 43 patients (Group B),

the rest of the mesh was laid under fascia without any fixations on neither inguinal ligament nor any part of conjoint tendon.

The severity of pain in the 1st postoperative day was evaluated by visual analog scale (VAS); asking the patients to scale the pain between 0 to 10. In 7th postoperative day; the patients examined for scrotal edema and wound seroma and in the 6th month for neuropraxia, paresthesia and recurrence.

The statistical software NCSS used for statistical analysis, comparing the groups with independent t-test; and for qualitative data the chi-square test and odds ratio with the confidence interval of 95% were used. A P value under 0.05 considered to be statistically significant.

Results

Hernia type and region were compared and the P values were 0.751 and 0.443, respectively, without statistical significance (Table 1).

Table (1) Region and type of hernia

		Group A		Group B		
Region	Right	24	57.10%	21	48.80%	$\chi^2 : 0.58$ P = 0.443
	Left	18	42.90%	22	51.20%	
Type	Indirect	23	54.80%	27	62.80%	$\chi^2 : 0.57$ P = 0.751
	Direct	14	33.30%	12	27.90%	
	Indirect+direct	5	11.90%	4	9.30%	

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The BMI and mean age showed no statistical significance between the groups; the P values were 0.236 and 0.063, respectively (Table 2).

Table (2) BMI and age of the patients

	Group A n: 42	Group B n: 43	t	p
Age	54.5 ± 12	50.33 ± 12.13	1.88	0.063
BMI	26.14 ± 3.29	25.3 ± 3.21	1.19	0.236

Regarding hospital stay duration; no significant difference found between the groups (P = 0.101); while the operative time was significantly

shorter in group B (P = 0.001), and the VAS scale was higher in group A (P = 0.001) (Table 3).

Table (3) Hospital stay, operative time and VAS score of the patients

	Group A n: 42	Group B n: 43	T	p
Operative time (minutes)	49.4 ± 13.17	32.37 ± 7.96	7.24	0.001
Hospital stay (days)	1.29 ± 0.46	1.14 ± 0.35	1.66	0.101
VAS	5.88 ± 2.06	3.88 ± 1.78	4.79	0.001

Regarding scrotal edema, seroma formation and recurrence; no significant difference found between the groups, P values were 0.976, 0.972

and 0.997, respectively. No statistical difference was found for neuropraxia and paresthesia, P values were 0.543 and 0.625, respectively (Table 4).

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Table (4) Seroma, scrotal edema, recurrence, paresthesia, and neuropraxia between the groups

		Group A		Group B		OR 95%	
Seroma	+	4	9.5%	4	9.3%	1.02	$\chi^2 : 0.001$
	-	38	90.5%	39	90.7%	0.23-4.4	P = 0.972
Scrotal edema	+	3	7.1%	3	7%	1.02	$\chi^2 : 0.002$
	-	39	92.9%	40	93%	0.19-5.39	P = 0.976
Recurrence	+	1	2.4%	1	2.3%	1.02	$\chi^2 : 0.0001$
	-	41	97.6%	42	97.7	0.06-6.94	P = 0.997
Paresthesia	+	3	7.1%	2	4.7%	1.6	$\chi^2 : 0.024$
	-	39	92.9%	41	95.3%	0.25-9.95	P = 0.625
Neuropraxia	+	2	4.8%	1	2.3%	2.1	$\chi^2 : 0.370$
	-	40	95.2%	42	97.7%	0.18-24	P = 0.543

Discussion

The main problem of the conventional hernia repair techniques is the tension on the suture tract, which can be decreased by a relaxation incision but not avoided completely, in several studies, tension-free repair with synthetic mesh has been reported to be superior to other modalities, in both open and laparoscopic surgery.⁸⁻¹¹

The ideal outcome of inguinal hernia surgery is to provide a recurrence free repair with minimum chances of early and late complications. Scrotal swelling occurs due to excessive dissection of hernia sac from the spermatic cord structures, dissection beyond pubic tubercle especially in the presence of complete hernial sac. Its incidence is 0.9 to 1.5% and most of the time it is transient and it resolves with scrotal elevation.² Seroma occurs due to an excessive inflammatory

response to suture or mesh which cannot be prevented and in most of the cases it resolves spontaneously but may require aspiration.¹³ The long term results of hernia repair are of vital importance. It means minimum chances of recurrence and morbidity. Chronic pain is becoming increasingly recognized as an important cause of morbidity after hernia surgery.¹⁴ Chronic pain after hernia repair is defined as pain or discomfort that persists for three or more than three months¹⁵, reported incidence is 4-6% after Lichtenstein mesh hernioplasty.¹⁶ Its incidence has gradually reduced, George H reported 1% incidence of chronic inguinal pain in 540 Lichtenstein repairs; several risk factors have been identified which seems to play an important role in the development of chronic pain, such as

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surgeons experience, day care surgeries, intensity of immediate post-operative pain and degree of specialization.⁽¹⁶⁾ One of the important causes of chronic pain is entrapment of ilio-inguinal nerve can occur if not identified and secured.¹⁷ Since the introduction of hernia repair by Lichtenstein (1987) who reported recurrence rate of 0.7%¹⁸

Although it was advised to fix the mesh in laparoscopic repair formerly, studies without mesh-fixation have been performed to avoid these complications and reported favorable results.¹⁹

Similar to these studies, we aimed to perform the standard open technique without mesh-fixation, to decrease

complication rates. In the study group, we spread the mesh (of approximately 6 x 10 cm) onto the inguinal region and fixed it only at the border of the internal ring with 2-0 prolene, without fixing it to the tissues. The mean operative time was 32.3 minutes, while it was found to be 49.4 minutes in the control group, which we consider as an important advantage of the technique. Additionally, postoperative pain was found to be significantly less in the study group, which is one of the most important factors affecting postoperative life quality.

In difference between the groups in terms of hospital stay, postoperative complications, and recurrence rates indicates the safety of the procedure.

Conclusion

In our study, we performed Lichtenstein procedure with and without mesh-fixation in two groups and compared the results prospectively in terms of patient demographics, postoperative complications, hospital stay, operative time, and effects on life quality. Operative time was found to be statistically shorter, and

postoperative pain score was found to be statistically lower in the study group.

Today, new techniques are being explored and introduced frequently in inguinal hernia surgery. Lichtenstein repair, which is accepted to be gold standard in open surgery, may be performed safely and effectively with better results, without mesh-fixation.

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