

Comparative Study of Lichtenstein's Mesh Repair versus Modified Bassini's Repair for Inguinal Hernia

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Received: 27-12-2022 / Revised: 08-01-2023 / Accepted: 03-02-2023

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Conflict of interest: Nil

Abstract

Introduction: An inguinal hernia, which manifests as a bulge in the groyne, is a chronic condition that is likely as old as man. Over the previous few decades, hernia repair has changed, going from anatomical repairs to mesh hernioplasties to laparoscopic repair. The concept of tension-free hernioplasty - Lichtenstein mesh repair was developed in response to an unsatisfactory rate of recurrence, prolonged postoperative pain, and recovery time following tissue repair, as well as our understanding of the metabolic basis of inguinal hernias. The tension-free mesh repair is clearly better to the conventional tissue approximation approach, as shown by numerous comparative randomised experiments. However, simple and affordable tissue restoration techniques like Bassini's offer an edge.

Materials & Methods: The purpose of this comparative randomised study, which included 70 patients, was to examine the clinical presentation, risk factors, and complications associated with surgical procedures over an 18-month period. Of the 70 patients, 35 were assigned to the group LMR (Lichtenstein's Mesh Repair) and 35 to the group MBR (Modified Bassini's Repair). Without discrimination, all patients diagnosed with inguinal hernias who were admitted to the department of general surgery at SCB Medical College in Cuttack were included in the study on a serial basis. Regardless of the patients' gender, all patients who visit the surgical outpatient department of general surgery at the SCB Medical College in Cuttack with symptoms of a swelling and/or pain in the inguino-scrotal region are diagnosed with an inguinal hernia.

Results: A total of 70 patients participated in the trial, with 35 (or 50%) of them being assigned to each group. In the current study, all patients were chosen regardless of the kind of inguinal hernia, with the distribution between the two groups being identical. Of the patients, 20 (28.6%) instances were of the Direct type and 50 (71.4%) cases were of the Indirect type. The presentation of an indirect hernia was 2.5 times greater than a direct hernia. The LMR group's mean surgery time (41.747.29) was significantly (p-value 0.05) lower than the MBR group's (47.117.51), showing that patients needed less time on the operating table, lowering the risk of associated complications, including anaesthetic ones. Residents also found LMR to be simpler to perform than MBR,

requiring a smaller learning curve. Only 2 patients, or 5.7%, of those who underwent Lichtenstein's mesh hernioplasty in the current study experienced post-operative wound infection. In the MBR group, there were none. P-value ($p > 0.05$) was not significant.

Conclusion: While the current comparative analysis does not clearly demonstrate any advantages of one repair over the other, Lichtenstein's mesh hernioplasty offers better outcomes in terms of recurrence and relative ease of the repair procedure when compared to modified Bassini's repair. In this study it was found that, time taken for lichtenstein mesh repair was significantly less. As the duration of study was fix cannot comment a strong status about recurrence but recurrence is less in lichtenstein mesh repair.

Keywords: Inguinal hernia, Lichtenstein's Mesh Repair, Modified Bassini's repair.

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Introduction

Hernias have been around for as long as surgery. An inguinal hernia, which manifests as a bulge in the groyne, is a chronic condition that is likely as old as man [1] Of all hernias, inguinal hernias are the most prevalent, and surgery is the only effective treatment [2]. The most frequent general surgical operation in clinical settings is hernia repair [3].

Even though this treatment is performed frequently, relatively few patients experience the optimal outcomes, and complications such post-operative discomfort, nerve damage, infection, and recurrence continue to pose difficulties for surgeons [4]. Remarkable work has been done by various anatomists & surgeons in the last two centuries in defining the anatomy of the inguinal region, understanding the bio-mechanics behind the etiology of hernia & in designing a suitable procedure that is easy to perform, with reduced post operative complications & recurrence rates [5].

Over the previous few decades, hernia repair has changed, going from anatomical repairs to mesh hernioplasties to laparoscopic repair [6]. Additionally, the fact that hernia procedures are now being conducted as day surgeries shows that hernia management has improved [7]. Developments in anaesthetic and pain management have played a role in this evolution [8]. Hernias in the inguinal

region are common, and the choice of treatment strategy, together with the perplexing nature of the etiologic background, make them one of the important components of surgery [9].

The concept of tension-free hernioplasty - Lichtenstein mesh repair was developed in response to an unsatisfactory rate of recurrence, prolonged postoperative pain, and recovery time following tissue repair, as well as our understanding of the metabolic basis of inguinal hernias [10-15]. Countless comparative randomised trials have amply proven that tension-free mesh repair is better to the conventional tissue approximation approach. However, simple and affordable tissue restoration techniques like Bassini's offer an edge. To choose the best method, numerous investigations have been conducted. There isn't, however, a consensus on the subject. The merits of these strategies have recently come under scrutiny [16-20].

Materials & Methods

This comparative randomised research of 70 patients, 35 of whom received the modified Bassini's repair (MBR) and 35 of whom received the Lichtenstein's mesh repair (LMR), was conducted to examine the clinical presentation, risk factors, and complications of surgical procedures during an 18-month period. Without discrimination,

all patients diagnosed with inguinal hernias who were admitted to the department of general surgery at SCB Medical College in Cuttack were included in the study on a serial basis.

Inclusion criteria: Include any patients, regardless of gender, who present to the surgical outpatient department of general surgery at SCB Medical College in Cuttack with complaints of swelling and/or pain in the inguino-scrotal region.

Exclusion Criteria:

1. Patients admitted for femoral or any other abdominal herniae
2. Congenital inguinal hernia in young patients
3. Patients with bilateral hernias and recurring inguinal hernias, along with pregnant women who have them
4. Patients with complex inguinal hernias hospitalized
5. Coagulation disorder patients and those taking anticoagulant medication

Patients were treated for any complicating medical diseases, such as Diabetes mellitus, Hypertension, ischaemic heart disease, and

COPD, before being reevaluated for surgical readiness.

Patients had either Lichtenstein's mesh hernioplasty or Modified Bassini's Repair (Anatomical repair) (Mesh repair). All patients received a 1gm IV injection of cefotaxime as pre-operative prophylaxis. The only anaesthetic given to either group was spinal.

For cohorts, the standard incision method of 2.5 cm above and parallel to the medial third of the inguinal ligament (Rt or Lt depending on the side of the hernia) was utilised.

Modified Bassini's repair: The external oblique aponeurosis was found and separated after a cut was made in the groyne crease. Depending on the type of hernia, the sac was removed from the cord tissues and treated properly. Polypropylene "1" interrupted sutures were used to attach the conjoint tendon to the inguinal ligament.

After the sac was dissected, a polypropylene mesh patch was applied to the defect and fastened using "1-0" polypropylene to the inguinal ligament below and the conjoint tendon above.

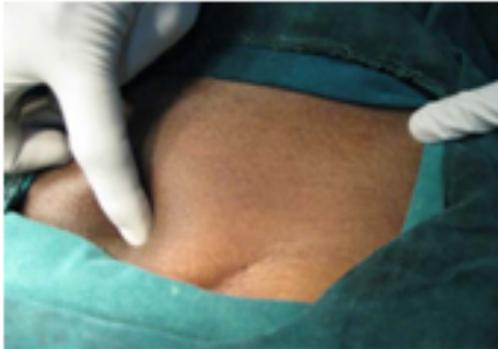
Results

Table 1: Groups - Number and percentage of patients

Group	Number of patients	%
Lichtenstein Mesh Repair (LMR)	35	50.0
Modified Bassini's Repair (MBR)	35	50.0
Total	70	100.0

Total number of 70 patients were present in study with equal distribution to both groups i.e. 35 (50%) each. Only spinal anesthesia was administered for surgery.

Modified Bassini's Repair



A. Site of incision – medial 2/3rd between pubic tubercle & Ant. Sup. iliac spine



B. External oblique aponeurosis cut along its fibres & reflected



C. Direct hernia on opening external oblique aponeurosis

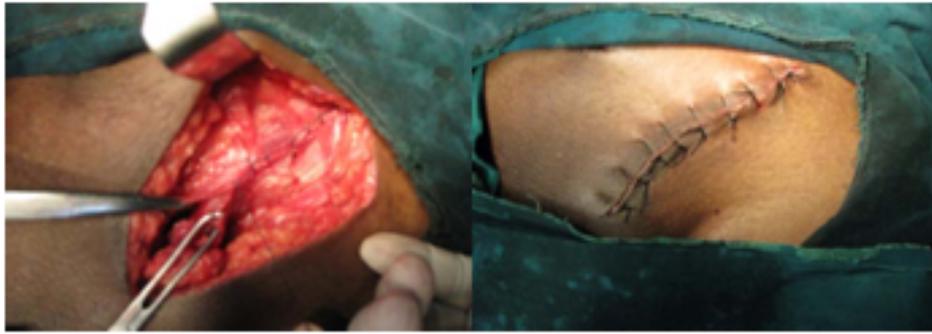


D. Direct component separated from cord structures and transected



E and F. Conjoint tendon sutured onto the inguinal ligament laterally and Cooper's ligament medially with interrupted polypropylene No. 1 sutures





G. External Oblique closed with new external ring

H. Skin closed with nylon '3-0' - mattress sutures

Lichtenstein Mesh Repair



A. Site of incision marked - 2.5 cm above & parallel to medial 3/5th of the inguinal lig.



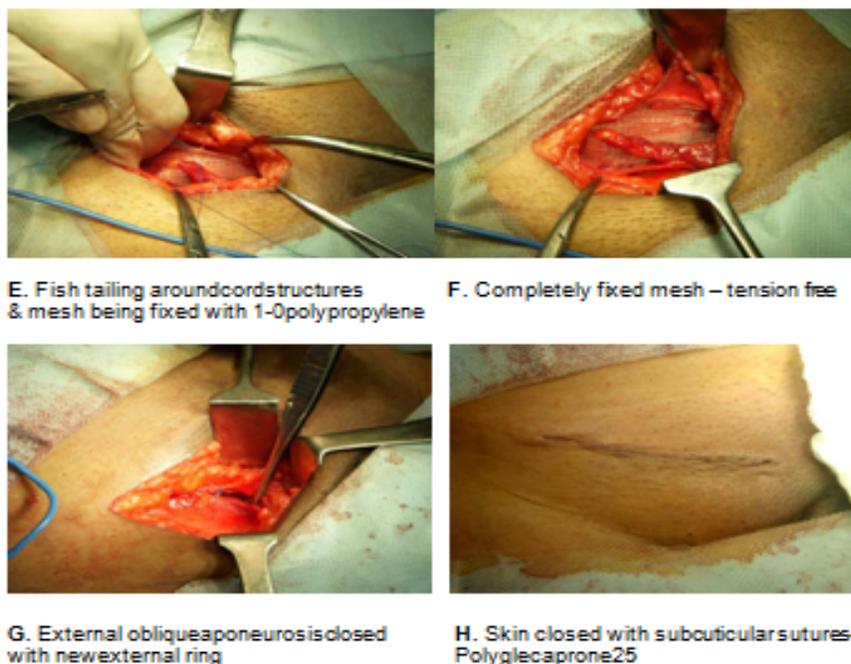
B. Direct hernia on opening the external oblique aponeurosis



C. Direct & indirect sacs separated from the cord structures, reduced and transected



D. 6X11 cm mesh being sutured to the reflected portion of the inguinal ligament, after repairing the posterior wall

**Table 2: Age distribution**

Age in years	Group LMR		Group MBR		Total	
	No	%	No	%	No	%
18-20	0	0.0	3	8.6	3	4.3
21-30	11	31.4	6	17.1	17	24.3
31-40	9	25.7	3	8.6	12	17.1
41-50	6	17.1	10	28.6	16	22.9
51-60	4	11.4	6	17.1	10	14.3
61-70	5	14.3	6	17.1	11	15.7
71-80	0	0.0	1	2.9	1	1.4
Total	35	100.0	35	100.0	70	100.0
Mean ± SD	40.71±14.44		46.23±16.52		43.47±15.65	

Samples are age matched with $p=0.142$

The age of the patients ranged between 18 years and 78 years. In the present study, 4.3% of patients were ≤ 20 yrs, 24.3% of patients were between 21-30 years, 17.1% of patients were between 31-40 years, 22.9% between 41-50 years, 14.3% between 51-60 years, 15.7% were between 61-70 years and 1.4% > 70 years. In the study, maximum number of patients presented between 21-30 years of age.

Table 3: Gender distribution

Gender	Group LMR		Group MBR		Total	
	No	%	No	%	No	%
Male	35	100.0	33	94.3	68	97.1
Female	0	0.0	2	5.7	2	2.9
Total	35	100.0	35	100.0	70	100.0

Samples are Gender matched with $P=0.49$

Over the period of study, of the total 70 patients, 68 (97.1%) were males with only 2 (2.9%) females and distribution between the two groups was insignificant.

Table 4: Type of hernia

Direct/Indirect	Group LMR (n=35)	Group MBR (n=35)	Total (n=70)
Direct	9 (25.7%)	11(31.4%)	20(28.6%)
Indirect	26 (74.3%)	24(68.6%)	50(71.4%)
Inference	Distribution of Direct/Indirect is statistically similar between two groups with P=0.792		

In the present study all patients were selected irrespective of type of inguinal hernia, of which 20 (28.6%) cases were of Direct type and 50 (71.4%) cases were of Indirect type with distribution between groups being similar. Indirect hernia presentation was 2.5 times more than direct hernia.

Table 5: Duration of surgery

Duration of surgery in min	Group LMR (n=35)	Group MBR (n=35)	Total (n=70)
Min-Max	25-56	32-61	25-61
Mean \pm SD	41.74 \pm 7.29	47.11 \pm 7.51	44.43 \pm 7.83
Inference	Duration of surgery is significantly less in LMR group with P=0.003**		

Mean duration of surgery in LMR group (41.74 \pm 7.29) was significantly (p- value <0.05) less than the MBR group (47.11 \pm 7.51) indicating that patients spent less time on the operating table thus reducing the risk of associated complications including anesthetic ones and residents found LMR more easier to perform requiring relatively lesser learning curve compared to MBR

Table 5: Post-Operative pain

Post-op pain	Group LMR (n=35) (Mean \pm SD)	Group MBR (n=35) (Mean \pm SD)	Total (n=70)	P value (LMR vs MBR)
POD 0	5.29 \pm 1.13	5.06 \pm 1.05	5.17 \pm 1.09	0.384
POD 1	3.31 \pm 1.35	3.26 \pm 1.07	3.29 \pm 1.21	0.844
POD 7	2.09 \pm 1.09	1.24 \pm 0.96	1.67 \pm 1.11	0.001**
POD 30	0.45 \pm 0.66	0.21 \pm 0.49	0.33 \pm 0.58	0.096 ⁺

A numerical rating scale was utilised to measure pain. For comparison between the two groups, the mean pain scores on the evening of the surgery day, post-operative days 1, 7, and 30, were taken into account. Both fixes were inferior and statistically insignificant for pain on POD 0 and POD 1. However, the LMR group experienced considerably (p-value 0.05) more pain on POD 7 than the MBR group, and one patient in the MBR group was lost for follow-up. Statistical significance of pain on POD 30 was merely indicative of greater in the LMR group (p-value 0.096), and 2 patients in each group (total 4) were lost for follow-up. So, only on POD 7, it was discovered that the LMR group had much more pain.

Table 6: Infection incidence according to technique of repair

Technique of repair	Number of patients in group	Number of patients with Infection	%
Lichtenstein's	35	2	5.7
Modified Bassini's	35	0	0.0
Total	70	2	2.9
Inference	Incidence of infection was 0% in MBR group compared to 5.7% in LMR with P=0.493		

Only 2 patients, or 5.7%, of those who underwent Lichtenstein's mesh hernioplasty in the current study experienced post-operative wound infection. In the MBR group, there were none. P-value ($p > 0.05$) was not significant.

Discussion

A new era in groyne repair was inaugurated by the description of the Lichtenstein mesh repair. The approach is highly straightforward, efficient, and fraught with few problems.

Therefore, it is currently the suggested procedure for inguinal hernia repair in all countries. Modified Bassini's repair, albeit rarely used, has advantages in environments with contaminated fields and limited resources [21-24].

In this study age from 18 to 78 were taken. Most of the patients are between 20-60. Age group 20-60 constitute almost 70% of patients.

Gender Distribution: In this study male patients outnumber female patients. Only two female patients were taken in study.

Type of Hernia: Most of the patients are having indirect inguinal hernias. In this study indirect inguinal hernias constitutes 70%.

Predisposing Factor: Many predisposing factors like smoking, obesity, chronic cough, chronic constipation, bladder outlet obstruction was taken into account. Among them smoking was the most important causes.

Duration of Surgery: Both type of surgeries were done by assistant professors and duration of the surgery was kept minimum. It was found that lichtenstein mesh repair was simple technique and took less time as compared to modified bassini's repair.

Post Operative Complications

Seroma: The more is the dissection more is the formation of seroma. In the present study 22.9% of patients with lichtenstein mesh repair develop serom as compared to only 8.6% in patients with modified bassini' repair. Here p-value was insignificant i.e 0.188.

Haematoma: Either bleeding from veins or artery may lead to haematoma. In this study 2.9% patients with lichtenstein mesh repair and 5.7% with modified bassini's repair developed haematoma.

Infection: Infection is the most serious complication. Infection may lead to destruction of tissue and lead to recurrence of hernia. In this present study 5.7% of cases with lichtenstein mesh repair developed infection but no incidence with modified bassini's repair.

RECURRENCE-This is the most important factor to determine the better method for hernia repair. In the present study 0% incident in lichtenstein mesh repair and 5.7% in modified bassini's repair. this indicate that lichtenstein mesh repair is better than bassini's repair.

Conclusion

The Lichtenstein mesh hernioplasty offers better results than the modified Bassini repair in terms of recurrence and relative ease of the repair to execute, even though the current comparative study does not clearly demonstrate any advantages of one repair over the other. In this study it was found that, time taken for lichtenstein mesh repair was significantly less. As the duration of study was fix cannot comment a strong status about recurrence but recurrence is less in lichtenstein mesh repair.

References

1. Ira M Rutkow. A selective history of groin hernia surgery in the early 19th century. The anatomic atlases of Astley Cooper, Franz Hesselbach, Antonio Scarpa and Jules Germain Cloquet Surgical Clinics of North America 1998; 78(6):921-940.
2. Mokete M and Earnshaw J.J. Evolution of Inguinal hernia surgery practices. Postgraduate Medical Journal, 2001; 77:189-190.
3. Irving L Lichtenstein. Hernia repair without disability: A surgical atlas illustrating the anatomy, technique and physiologic rationale of the One Day Hernia. Saint Louis: The C.V. Mosby Company, 1970;1274-1279
4. Gilbert A.I., Graham M F, Voigt W J. A bilayered patch device for inguinal hernia repair. Hernia. 1999; 3:161-166.
5. Anderson RA. Historical aspects of repair of inguinal hernia N C Med J. 1963; 24:324-327
6. Rousseau MA, Perdu M, Ledroux M, Delmas V (Pectineal ligament of Cooper- Micromorphometric study) morphologic. 1999;83(260):67-69
7. Read RC The centenary of Bassini's contribution to inguinal herniorrhaphy. American Journal of Surgery 1987; 153(3):324-326
8. Wexler MJ The repair of inguinal hernia 110 years after Bassini. Canadian Journal of Surgery 1997;40(3):186-191
9. Laird EG. The evaluation of the Gallie's fascia lata repair of difficult hernias. Del Med J 1953;25(1):3-8
10. Lee M. Indications for use of fascial grafts in repair of inguinal hernia (Gallie's operation). J Int Coll Surg 1953;19(3):290-295.
11. Magarey JR the long-term results of tanner's 'slide' operation for inguinalhernia. Med J Aust 1966; 1(10):392-395
12. Hoffman R, Frick T, Attinger B, Platz A, Largiader F. Bassini or Shouldice operation? Helv Chir Acta 1991;58(1-2):207-212.
13. Madden JL Hakim S agorogiannis AB. The anatomy and repair of inguinal hernia. Surgical clinics of North America 1971;51(6)1269-1292.
14. C.B. McVay. The normal and pathological anatomy of Transversalis Abdominis Muscle. Surgical Clinics of North America 1971; 5:1251.
15. C.B. McVay. the Anatomical basis of inguinal Hernia and Femoral Hernioplasty; Surg Obstet Gynaecol. 1974;139:939.
16. Lichtenstein H, Amid PK, Shulman AG. The iliopubic tract - The key to inguinal herniorrphy. Int surg 1990;75(4):244-246.
17. Peri G, Farina F, Marciano V, Ridola C, Diana G *et al*. Clinical and anatomical features of the inguinal hernia. Ital J Anat embryology 1996;101(2):69-80.
18. Ando H, Kaneko K, Ito F, Seo T, Ito T. Anatomy of round ligament in female infants and children with an inguinal hernia. Br J Surg 1997;84(3):404-405.
19. C B Mc Vay. The inguinal and femoral hernioplasty: Master of surgery-Nyhus and Baker; 2nd edition 1984, Little Brown &Co. Boston;1274-1295.

20. Reinno. W.F. Defective Collagen Synthesis in inguinal herniation. American Journal of Surgery 1972; 124:819.
21. Gilbert. An anatomic and functional classification for the diagnosis and treatment of inguinal hernia. American Journal of Surgery 1989; 157:331-333
22. Delvin H Brendon. Management of abdominal hernias. London: Butterworths and Co 1988; 220.
23. Morone G, Meriggi F, Forni E. An update of Bassini's operation for the treatment of inguinal hernia. G Chir 1994;15(6-7):317-320.
24. Barbier J, Carretier M, Richer JP, Cooper ligament repair; An update. World J Surg 1989;13(5):499-505.
25. Amid PK. Classification of biomaterials and their related complications in abdominal wall hernia surgery. Hernia;12-19.
26. Lt Col MM Harjai, Brig BM Nagpal, *et al.* A Prospective Randomized Controlled Study of Lichtenstein's Tension Free versus Modified Bassini Repair in the Management of Groin Hernias: MJAFI 2007; 63:40-43.