



ORIGINAL RESEARCH ARTICLE



Comparative Analysis of Postoperative Pain, Complication Rate, and Return to Work Following Lichtenstein Mesh Hernioplasty versus Modified Bassini Repair for Primary Inguinal Hernia in Adult Male and Female Patients

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Abstract

Background: Inguinal hernia repair remains one of the most commonly performed general surgical procedures, with the Lichtenstein tension-free mesh technique and the modified Bassini tissue-repair technique representing two widely practised approaches, particularly in settings where cost considerations influence technique selection.

Objectives: To compare operative time, hospital stay, postoperative pain, complication rate, and time to return to work between patients undergoing Lichtenstein mesh hernioplasty and modified Bassini repair for primary inguinal hernia.

Methods: A prospective comparative study was conducted on 158 adult patients with primary inguinal hernia, of whom 84 underwent Lichtenstein mesh hernioplasty and 74 underwent modified Bassini repair based on surgeon and patient preference. Operative and postoperative parameters were recorded and compared between groups, with follow-up to 12 months.

Results: Mean operative time (42.6 vs 55.3 minutes), hospital stay (2.8 vs 3.9 days), and time to return to work (14.2 vs 22.7 days) were all significantly shorter in the Lichtenstein group compared with the Bassini group ($p < 0.001$ for all). Chronic groin pain at three months was less frequent following Lichtenstein repair (3.6%) than Bassini repair (10.8%), as was 12-month recurrence (1.2% vs 5.4%).

Conclusion: Lichtenstein tension-free mesh hernioplasty offers significant advantages over modified Bassini repair in terms of operative time, hospital stay, postoperative pain, recurrence, and return to work, supporting its preferential use for primary inguinal hernia repair where mesh is not contraindicated.

Keywords: Inguinal hernia, Lichtenstein repair, Bassini repair, chronic groin pain, general surgery.

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1 | INTRODUCTION

Inguinal hernia repair remains one of the most frequently performed procedures in general surgical practice worldwide, reflecting the substantial lifetime prevalence of this condition, particularly among adult men.^{9,10} Historically, tissue-based repair techniques such as the Bassini repair, first described in the late nineteenth century, formed the mainstay of surgical management, relying on approximation of adjacent tissue layers under variable degrees of tension to reconstruct the posterior inguinal wall.¹

The introduction of the tension-free mesh hernioplasty technique by Lichtenstein and colleagues represented a paradigm shift in inguinal hernia surgery, employing a synthetic mesh to reinforce the posterior inguinal wall without relying on tissue approximation under tension, a principle that has since been associated with reduced postoperative pain and lower recurrence rates in numerous comparative studies.^{2,3,4} Despite the accumulating evidence favouring mesh-based repair, tissue-based techniques such as the modified Bassini repair remain in use in many resource-limited settings, particularly where mesh availability or cost considerations limit its routine use, or in specific clinical situations where mesh placement is relatively contraindicated, such as in the presence of contamination.¹¹

Comparative outcomes between these two techniques, including operative time, postoperative pain, complication rates, and functional recovery as measured by time to return to work, remain clinically relevant in guiding technique selection, particularly in settings where both approaches continue to be practised based on surgeon preference, patient factors, or resource availability.^{12,13} Chronic postoperative groin pain, in particular, has emerged as an important outcome measure in hernia surgery research, given its substantial impact on long-term patient satisfaction and quality of life, independent of anatomical recurrence.^{15,16,17}

This study was undertaken to prospectively compare operative time, postoperative hospital stay, pain outcomes, complication rates, and time to return to work between patients undergoing Lichtenstein

mesh hernioplasty and modified Bassini repair for primary inguinal hernia in routine surgical practice.

From a health-systems perspective, the choice between these two techniques also carries important resource implications, as mesh-based repair entails an additional consumable cost that must be weighed against the potential benefits of reduced hospital stay, faster functional recovery, and lower rates of long-term complications such as chronic pain and recurrence, each of which carries its own downstream healthcare and productivity costs.^{9,10} Locally generated comparative outcome data of this nature can help inform rational technique selection and resource allocation decisions in settings where both approaches remain in routine use.

2 | MATERIALS AND METHODS

2.1 | Study Design and Setting

This was a hospital-based, prospective comparative study conducted in the Department of General Surgery of a tertiary care teaching hospital.

2.2 | Study Population

A total of 158 adult patients with primary unilateral inguinal hernia undergoing elective repair were enrolled after obtaining informed consent, and allocated to either the Lichtenstein mesh hernioplasty group (n=84) or the modified Bassini repair group (n=74) based on surgeon preference, mesh availability, and patient-specific clinical factors.

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2.3 | Inclusion Criteria

Adult patients aged 18 years and above with a clinically diagnosed primary unilateral inguinal hernia undergoing elective repair were included.

2.4 | Exclusion Criteria

Patients with recurrent, bilateral, incarcerated, or strangulated inguinal hernia, those undergoing emergency repair, and those unwilling to provide consent were excluded from the study.

2.5 | Surgical Technique

Patients in the Lichtenstein group underwent standard tension-free mesh hernioplasty using a polypropylene mesh secured to the pubic tubercle, inguinal ligament, and conjoint tendon. Patients in the Bassini group underwent modified Bassini repair, with approximation of the conjoint tendon to the inguinal ligament using non-absorbable sutures. All procedures were performed under spinal or general anaesthesia as clinically appropriate.

2.6 | Outcome Assessment

Operative time, postoperative hospital stay, and intraoperative and postoperative complications were recorded for all patients. Postoperative pain was assessed using a visual analogue scale (VAS) at three months. Patients were followed up at 2 weeks, 6 weeks, 3 months, 6 months, and 12 months to assess for complications, chronic groin pain, and recurrence. Time to return to routine work or occupational activity was recorded for each patient.

2.7 | Statistical Analysis

Data were analysed using descriptive statistics, with continuous variables expressed as mean $\pm$ standard deviation and compared between groups using the independent samples t-test. Categorical variables were expressed as frequencies and percentages. A p-value of less than 0.05 was considered statistically significant. Results were tabulated and represented graphically using multiple chart formats, including

a schematic illustration comparing the two surgical techniques.

2.8 | Operational Definitions

Chronic groin pain was defined as pain persisting beyond three months postoperatively, assessed using a 10-point visual analogue scale, with mild pain defined as a score of 1-3, moderate as 4-6, and severe as 7-10. Recurrence was defined as a clinically palpable or radiologically confirmed hernia at the same site on follow-up examination up to 12 months postoperatively. Return to work was defined as the number of days from surgery to resumption of the patient's usual occupational activity, whether sedentary or physically demanding.

3 | RESULTS

Of the 158 patients studied, 84 underwent Lichtenstein mesh hernioplasty and 74 underwent modified Bassini repair. The age-wise distribution by surgical group is summarised in Table 1 and illustrated in Figure 1.

The 41–50 year age group accounted for the largest proportion of cases in both groups (28.5% overall), with a broadly comparable age distribution between the two surgical groups.

As shown in Table 2 and Figure 2, patients undergoing Lichtenstein repair had significantly shorter mean operative time, postoperative hospital stay, and time to return to work compared with those undergoing Bassini repair ($p < 0.001$ for all three parameters).

Overall complication rates were lower in the Lichtenstein group across most categories, most notably for chronic groin pain (3 vs 8 cases) and recurrence at 12 months (1 vs 4 cases), while seroma formation was modestly more frequent in the Lichtenstein group, consistent with the recognised association between mesh placement and seroma formation in the immediate postoperative period.

At three months, 81.0% of patients in the Lichtenstein group reported no pain, compared with 56.8% in the Bassini group, while moderate to severe pain was reported by only 4.8% of the Lichtenstein group

TABLE 1: Age-wise Distribution of Patients by Surgical Group (n = 158)

Age Group (years)	Lichtenstein Group (n)	Bassini Group (n)	Total (n)	Percentage (%)
18–30	10	9	19	12.0
31–40	18	16	34	21.5
41–50	24	21	45	28.5
51–60	20	18	38	24.1
61–70	12	10	22	13.9
Total	84	74	158	100.0

Figure 1: Age-wise Distribution of Patients by Surgical Group (n=158)

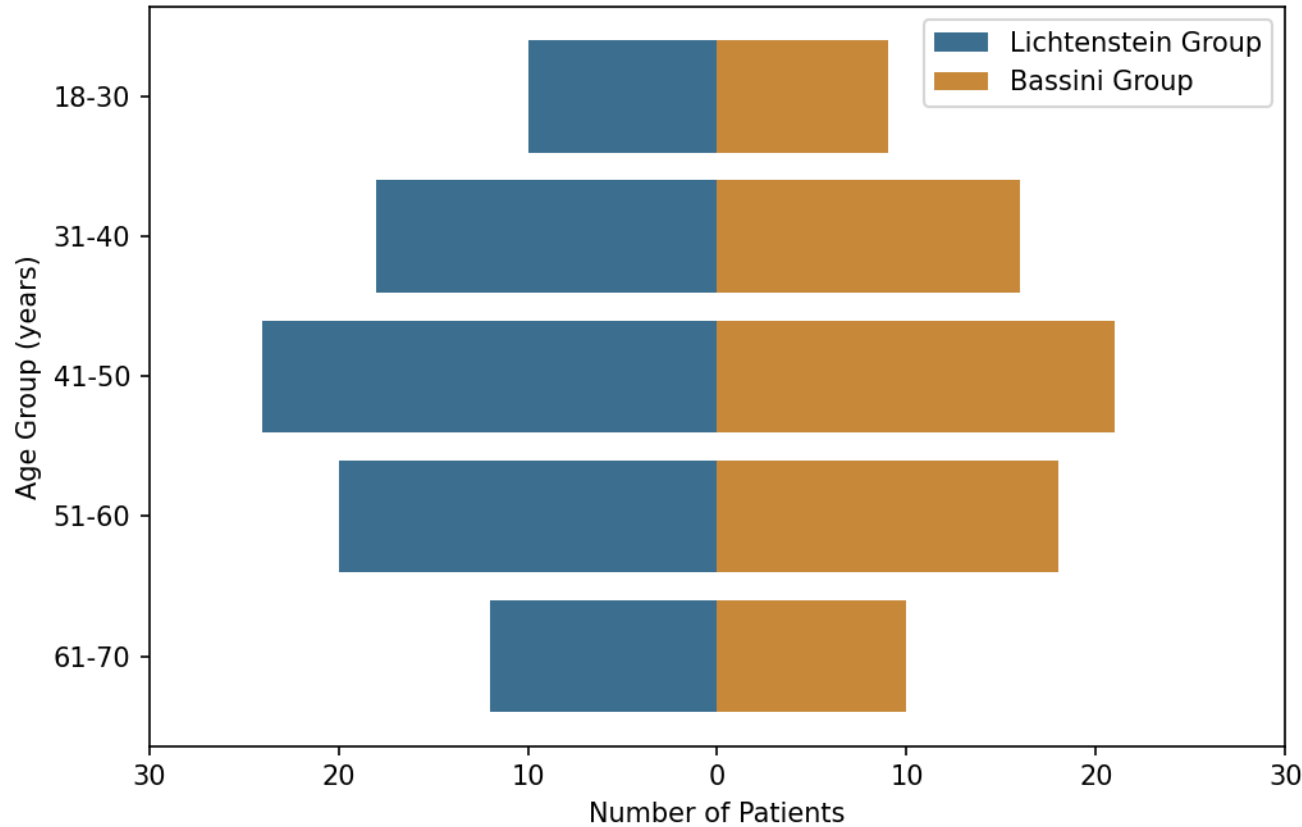


FIGURE 1:

TABLE 2: Comparison of Operative Time, Hospital Stay, and Return to Work (Figure 2)

Parameter	Lichtenstein (n=84)	Bassini (n=74)	p-value
Operative time (minutes)	42.6 ± 6.1	55.3 ± 7.4	<0.001
Postoperative hospital stay (days)	2.8 ± 0.6	3.9 ± 0.9	<0.001
Time to return to work (days)	14.2 ± 2.4	22.7 ± 3.1	<0.001

Figure 2: Comparison of Operative Time, Hospital Stay, and Return to Work

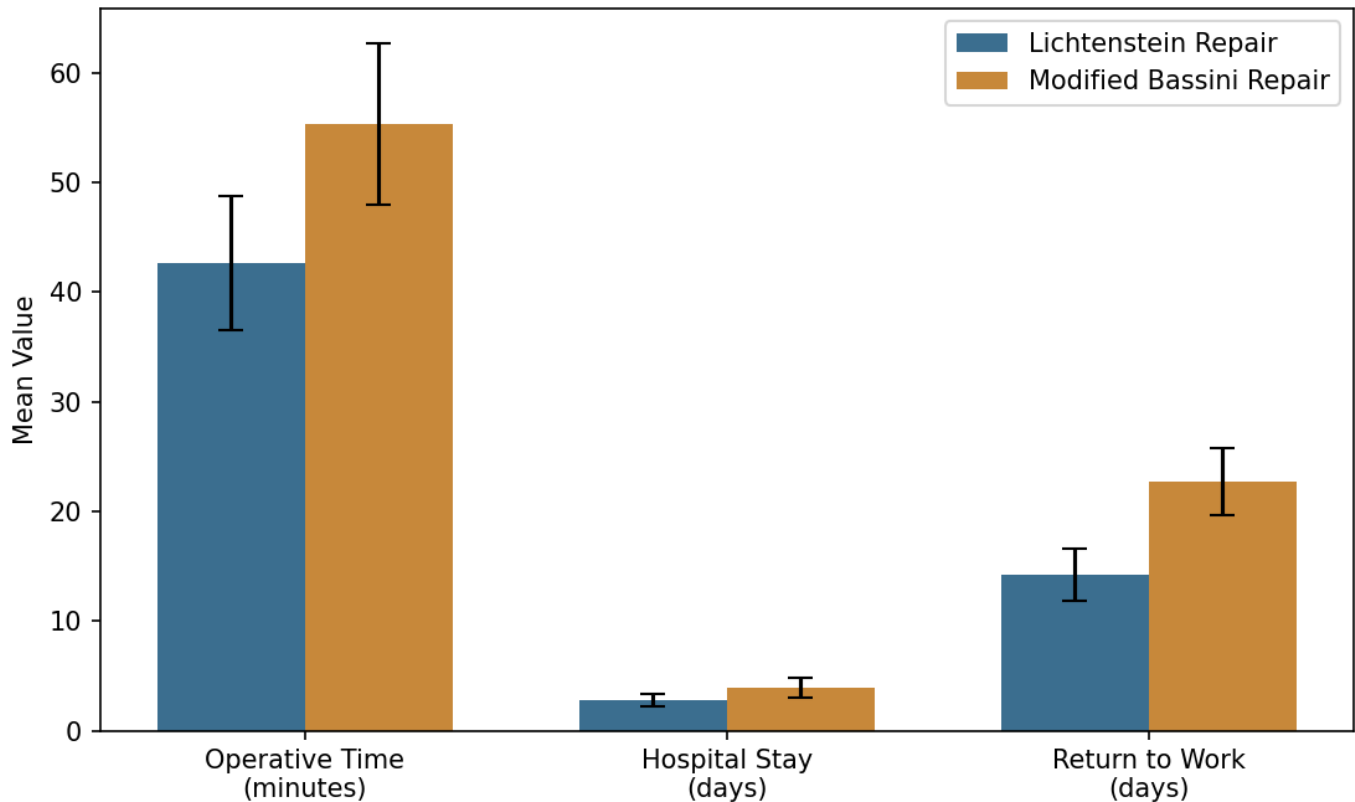


FIGURE 2:

TABLE 3: Postoperative Complications by Surgical Group (Figure 3)

Complication	Lichtenstein (n)	Bassini (n)	Total (n)
Wound infection	3	6	9
Seroma	6	8	14
Scrotal oedema	3	4	7
Chronic groin pain (>3 months)	3	8	11
Recurrence (12-month follow-up)	1	4	5

TABLE 4: Pain Status at Three-Month Follow-up (VAS Score)

Pain Status at 3-Month Follow-up	Lichtenstein (n=84)	Bassini (n=74)
No pain	68	42
Mild pain (VAS 1-3)	12	19
Moderate pain (VAS 4-6)	3	9
Severe pain (VAS 7-10)	1	4

Figure 3: Overall Postoperative Complications (Both Groups Combined, n=158)

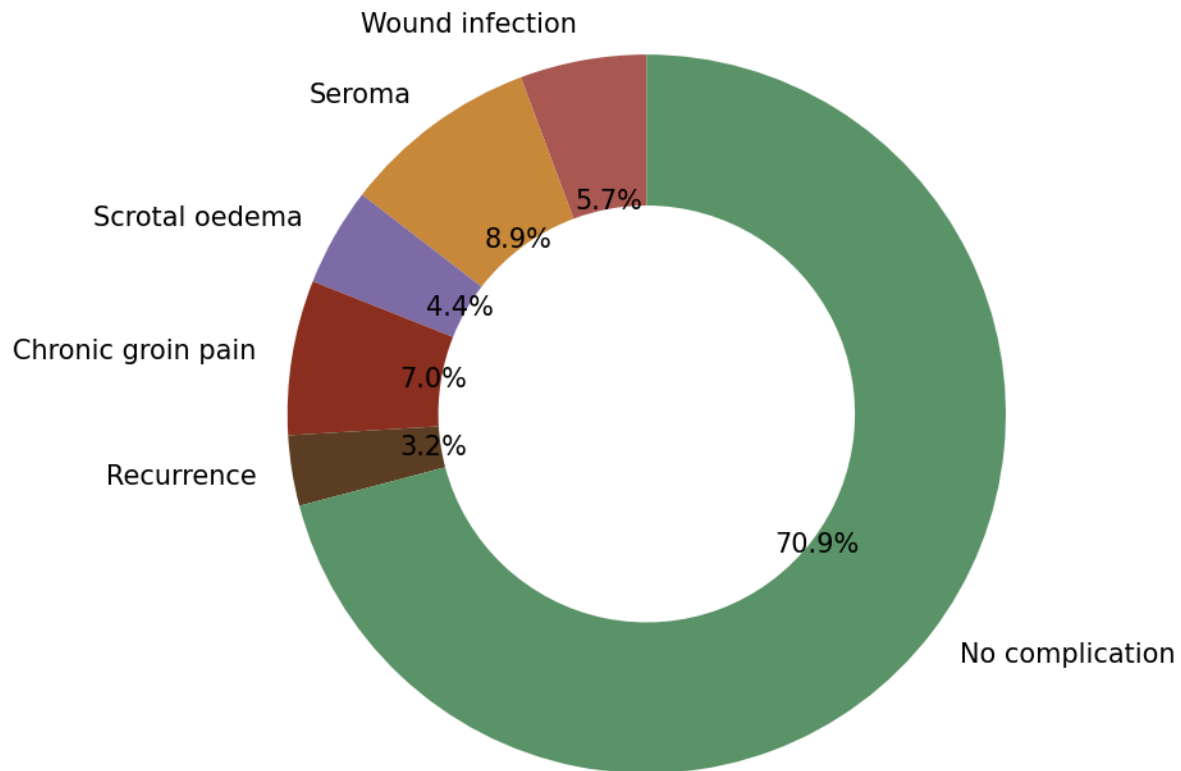


FIGURE 3:

compared with 17.6% of the Bassini group.

Figure 4 provides a schematic illustration comparing the modified Bassini tissue-repair technique with the Lichtenstein tension-free mesh repair technique used in this study.

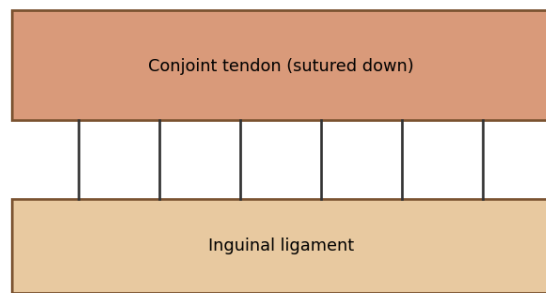
4 | DISCUSSION

The significantly shorter operative time observed in the Lichtenstein group in this study is consistent with the technical simplicity of mesh placement compared with layered tissue approximation required in the Bassini technique, a finding that has been similarly reported in prior comparative studies of these two approaches.^{11,12,13} The shorter hospital stay and faster return to work observed with Lichtenstein repair likely reflect the tension-free nature of the mesh

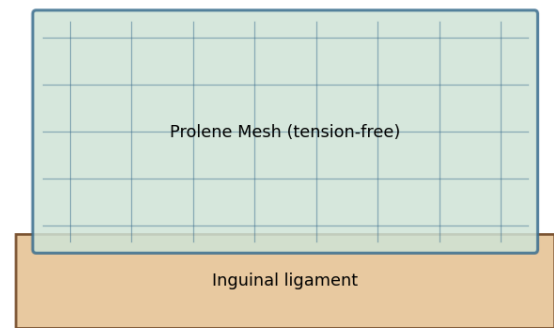
reconstruction, which is associated with less postoperative discomfort and earlier mobilisation compared with the tissue-under-tension approach of the Bassini technique.^{2,4}

The lower rate of chronic groin pain observed with Lichtenstein repair in this study aligns with the broader hernia surgery literature, which has consistently identified tension on the repaired tissue as a key contributing factor to chronic postoperative pain, a recognised and clinically significant long-term complication of tissue-based hernia repair techniques.^{15,16,17} The lower 12-month recurrence rate observed with Lichtenstein repair is similarly consistent with a substantial body of randomised controlled trial evidence and meta-analyses demonstrating superior anatomical durability of mesh-based repair compared with tissue-based techniques.^{5,6}

Schematic Illustration: Modified Bassini Repair vs Lichtenstein Tension-Free Mesh Repair
(Illustrative diagrams, not actual intraoperative photographs)



A. Modified Bassini Repair:
Tissue approximation under tension



B. Lichtenstein Repair:
Tension-free mesh reinforcement

FIGURE 4:

The modestly higher rate of seroma formation observed in the Lichtenstein group in this study is a recognised, generally self-limiting complication associated with the presence of a foreign mesh material, and has been similarly reported in other comparative series, without offsetting the overall favourable outcome profile of the tension-free technique.¹⁸ Despite the clear advantages demonstrated for Lichtenstein repair in this and other studies, the modified Bassini technique retains a role in specific clinical scenarios, including contaminated fields where mesh placement carries a theoretically higher infection risk, and in resource-limited settings where mesh may not be readily available or affordable.¹¹

These findings collectively reinforce the substantial and consistent evidence base supporting Lichtenstein tension-free mesh hernioplasty as the preferred technique for primary inguinal hernia repair in the majority of clinical scenarios, while acknowledging the continued, more limited role of tissue-based repair in specific circumstances.^{7,8}

It is also worth noting that surgeon experience and familiarity with a given technique can meaningfully influence operative outcomes independent of the

technique itself, and the learning curve associated with mesh placement is generally considered shorter and more reproducible than that required to safely and effectively perform tension-based tissue approximation in the Bassini technique.¹² This consideration has practical relevance for surgical training programmes, where standardising on a tension-free mesh technique as the primary approach taught to trainees may confer both immediate procedural and longer-term patient outcome benefits, while ensuring trainees retain familiarity with tissue-based repair for the less common scenarios in which it remains indicated.

5 | SUMMARY

This prospective comparative study of 158 patients undergoing primary inguinal hernia repair found that Lichtenstein mesh hernioplasty was associated with significantly shorter operative time, hospital stay, and return to work, along with lower rates of chronic groin pain and recurrence, compared with modified Bassini repair, at the cost of a modestly higher rate

of seroma formation.

6 | LIMITATIONS

This study has several limitations that merit consideration. First, allocation to surgical technique was based on surgeon and patient preference rather than randomisation, which may have introduced selection bias between the two groups. Second, its single-centre design may limit generalisability to other practice settings with differing surgical expertise and patient populations. Third, the 12-month follow-up period, while adequate to capture most early recurrences, may not detect later recurrences that can occur beyond this period, as described in longer-term follow-up studies of hernia repair outcomes.

7 | RECOMMENDATIONS

Based on the findings of this study, Lichtenstein tension-free mesh hernioplasty should be considered the preferred technique for primary inguinal hernia repair in the majority of patients, given its favourable profile across operative time, postoperative pain, recurrence, and functional recovery outcomes. Modified Bassini repair should be reserved for specific clinical scenarios where mesh placement is relatively contraindicated or unavailable. Extended follow-up beyond 12 months and randomised allocation in future studies would help further strengthen the comparative evidence base between these two techniques in similar practice settings.

8 | CONCLUSION

Lichtenstein tension-free mesh hernioplasty offers significant advantages over modified Bassini repair in terms of operative time, hospital stay, postoperative pain, recurrence, and return to work, supporting its preferential use for primary inguinal hernia repair where mesh is not contraindicated, while modified Bassini repair remains a viable alternative in select

clinical circumstances.

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