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BACK TO BASICS: A RANDOMIZED COMPARISON OF DESARDA'S AND MOLONEY'S DARNING REPAIRS FOR INGUINAL HERNIA

General Surgery

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ABSTRACT

Background Mesh-based inguinal hernia repair remains the standard of care; however, mesh-related complications, cost, and contraindications necessitate effective tissue-based alternatives. Desarda's and Moloney's darning repairs are established non-mesh techniques with renewed relevance, particularly in resource-limited settings. **Methods** This prospective randomized study included 60 adult patients with uncomplicated inguinal hernias treated between July 2022 and December 2024. Patients were randomly allocated to undergo either Desarda's repair or Moloney's darning repair. Operative time, postoperative pain, complications, and early recurrence were assessed over a 6-month follow-up period. **Results** Operative times were comparable between the two techniques ($p = 0.318$). Overall postoperative complications were higher in the darning group (40.0%) compared with the Desarda group (22.6%), though this difference was not statistically significant ($p = 0.14$). Postoperative pain was significantly lower following Desarda repair ($p = 0.02$). No early recurrences were observed in either group. **Conclusion** Desarda's repair was associated with reduced postoperative pain and fewer complications while demonstrating comparable operative times and early outcomes to Moloney's darning repair. Both techniques represent effective non-mesh options for inguinal hernia repair, particularly in settings where mesh use is limited or contraindicated.

KEYWORDS

INTRODUCTION

A hernia is the abnormal protrusion of an organ or tissue through a defect in its surrounding wall, commonly occurring in the abdominal wall, particularly the inguinal region. Groin hernias, including indirect and direct inguinal, femoral, obturator, and suprapubic hernias, are the most common types [6,7]. Indirect inguinal hernias are the most frequent, especially in men [7].

Herniorrhaphy became standardized following Bassini's anatomical repair in the 1880s. Today, mesh-based repair is standard, especially Lichtenstein's tension-free repair [8], but it has limitations in cases with infection risk or financial constraints. Tissue-based techniques like Desarda and Darning offer alternatives [2,3,4].

Desarda's repair uses a strip of the external oblique aponeurosis to create a dynamic posterior wall, avoiding mesh [3]. Moloney's darning technique reinforces the inguinal floor using multiple passes of monofilament nylon sutures in a woven pattern [4]. Both aim to reduce tension and restore anatomy. Systematic reviews suggest these techniques are viable and safe in low-resource settings [20,21,22].

Methods

This prospective, randomized controlled trial was conducted at MGM Medical College and Hospital, Navi Mumbai, from July 2022 to December 2023, to compare clinical outcomes and complications between Desarda's tissue-based repair and the Darning technique in inguinal hernia surgery. Sixty patients aged 18–80 years with uncomplicated inguinal hernias were selected using simple random sampling after obtaining informed consent. The study aimed to evaluate operative time, postoperative chronic pain, and other complications and early recurrence rates for both techniques. Patients with recurrent, congenital, giant inguinoscrotal hernias, BMI > 30, those unfit for surgery, or pregnant women were excluded. All participants underwent thorough preoperative assessment, including history, clinical examination, lab investigations, imaging, and anesthetic evaluation, with standard preoperative preparation and antibiotic prophylaxis [1,6].

Ethical Approval and Consent

The study was approved by the Institutional Ethics Committee (Approval No. DHR-EC/NEW/INST/2021/2255) at MGM Medical College, Kamothe, Navi Mumbai. . Written informed consent was obtained from all participants prior to enrollment, and the study was conducted in accordance with ethical standards and the Declaration of Helsinki.

Operating technique—

A transverse incision was made from just lateral to the pubic symphysis, and dissection proceeded through subcutaneous tissue to expose the external oblique aponeurosis. The aponeurosis was incised, preserving a larger medial flap for Desarda repair. The ilioinguinal nerve was safeguarded, and the spermatic cord was mobilized up to the deep ring. The hernia sac was identified, separated from cord structures, and managed accordingly. Indirect sacs were ligated and reduced; distal sacs were incised anteriorly to prevent hydrocele. Direct hernia sacs were reduced with plication of the transversalis fascia using 2-0 Prolene. Hemostasis was maintained throughout. In the Desarda repair, a 1.5–2 cm wide strip was then split from the upper leaf of the external oblique aponeurosis, preserving its medial and lateral attachments. This strip was sutured continuously to the internal oblique muscle using 2-0 Prolene. After confirming adequate tension by inducing a cough response, the spermatic cord was positioned in the newly created inguinal canal, and the lower leaf of the aponeurosis was sutured over it to the newly formed upper leaf [3,11].


Figure 1: Flap of external oblique aponeurosis used as autologous mesh for posterior wall reconstruction

Figure 2: Final posterior wall reconstruction after Desarda repair

In Darning repair, the inguinal ligament is approximated to the conjoint tendon using 1-0 Prolene from the pubic tubercle to the internal ring and back, without tension. A weave-like suture pattern reinforces the posterior wall. The first oblique row starts at the pubic tubercle and proceeds laterally behind the cord to the deep ring, with locked stitches 1 cm apart. Vertical rows are interwoven through the horizontal layer, mimicking a sock-darning pattern, and include the conjoint tendon, internal oblique aponeurosis, transverse fascia, and iliopubic tract for triple-layer reinforcement [4,17].

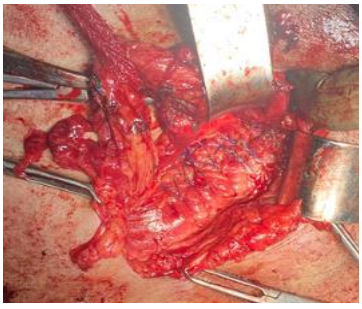


Figure 3: Tension-free Moloney's darning repair technique

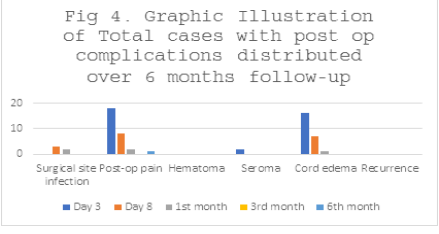
RESULTS

Data were entered in Microsoft Excel and analyzed using SPSS version 25 on Windows 10. Continuous variables were expressed as mean ± SD, and categorical variables as frequencies and percentages. The Chi-square test assessed associations between categorical variables, while the Wilcoxon-Mann-Whitney test compared means between two independent groups due to non-normal data distribution. Postoperative pain was evaluated using the Visual Analog Scale along with clinical examination on days 1, 3, 7, and at 1, 3, and 6 months [12,13].

The data summarize hernia surgeries, covering patient demographics, surgical techniques, and post-operative outcomes. The average patient age was 51.74 years (SD 18.31). Hernia types included bilateral (16.4%), left-sided (36.1%), and right-sided (47.5%). Both Darning and Desarda techniques were used equally (50% each). Post-operative complications occurred in 31.1% of cases, with pain in 29.5%, cord edema in 26.2%, seroma in 3.3%, and surgical site infections in 4.9%. This analysis provides insights into the effectiveness and risks of the two techniques [14,15].

TABLE 1: PATIENT COMPLICTIONS OVER FOLLOW-UP

Complications	Day 3	Day 8	1st month	3rd month	6th month
Surgical site infection	0	3	2	0	0
Post-op pain	18	8	2	0	1
Hematoma	0	0	0	0	0
Seroma	2	0	0	0	0
Cord edema	16	7	1	0	0
Early Recurrence	0	0	0	0	0



The study aimed to compare the operative time of Desarda and Darning techniques for inguinal hernia repair, performed by a single resident surgeon. Darning Repair had a mean time of 96.00 minutes (SD 28.78), while Desarda Repair averaged 89.84 minutes (SD 23.96). The overall mean was 92.87 minutes (SD 26.40). Statistical analysis using the Wilcoxon-Mann-Whitney test yielded a p-value of 0.318, indicating no significant difference between the two techniques. These findings suggest that both Desarda and Darning techniques require comparable operative times, making them equally viable options for inguinal hernia repair [10,20].

Table 2: Operative Time Comparison

Technique Used	N	Mean	Std. Deviation	Median	p-value
Darning Repair	30	96.00	28.78	85.00	0.318
Desarda Repair	30	89.84	23.96	80.00	-
Total	60	92.87	26.40	85.00	-

The study compared postoperative complications between Desarda and Darning techniques in inguinal hernia repair. Overall complications occurred in 40.0% of Darning cases and 22.6% of Desarda cases, but the p-value (0.14) showed no significant difference. Postoperative pain was significantly lower in Desarda cases (16.1%) than Darning (43.3%), with a p-value of 0.02. Cord edema was more common in Darning (36.7%) than Desarda (16.1%), but the p-value (0.09) suggested a possible difference. No significant differences were found for seroma and surgical site infections, with p-values of 0.98 and 0.53, respectively [5,11,14].

No cases of early recurrence were observed in either group at the 6-month follow-up, consistent with findings from previous short-term follow-up studies evaluating non-mesh repairs [1,18,20].

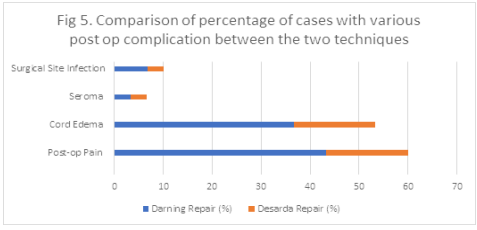


Table 3: Statistical analysis of comparison of percentage of post-operative complications

Complication	FREQUENCY	PERCENTAGE	Darning Repair (%)	Desarda Repair (%)	p-value
Any Complications (No)	41	68.3	60.0	77.7	0.14
Any Complications (Yes)	19	31.7	40.0	22.3	-
Post-op Pain (No)	42	70.0	56.7	83.33	0.02**
Post-op Pain (Yes)	18	30.0	43.3	16.67	-
Cord Edema (No)	44	73.3	63.3	83.33	0.09*
Cord Edema (Yes)	16	26.7	36.7	16.67	-
Seroma (No)	58	96.7	96.7	96.7	0.98
Seroma (Yes)	2	3.3	3.3	3.3	-
Surgical Site Infection (No)	57	95.0	93.3	96.7	0.53
Surgical Site Infection (Yes)	3	5.0	6.7	3.3	-

Table 4: Derivation of p value in various tests

Test	Value
Mann-Whitney U Value	392
Z	0.8501
p-value	0.318

DISCUSSION

This prospective randomized study compared Desarda's and Moloney's Darning repairs—two established tissue-based techniques that avoid the use of synthetic mesh. Both techniques demonstrated comparable operative times, which aligns with findings from prior comparative studies and meta-analyses [10,20].

A notable finding of the present study was the significantly reduced incidence of postoperative pain in patients undergoing Desarda's repair. Chronic postoperative pain remains a significant concern following inguinal hernia surgery, particularly with mesh-based

repairs [12,13]. The dynamic posterior wall reconstruction achieved using the external oblique aponeurotic strip in Desarda's repair may reduce tension and nerve irritation, contributing to improved pain outcomes, as suggested by previous randomized trials [5,11].

Cord edema was the most frequently observed complication and occurred more commonly in the Darning group. This may be attributed to increased tissue handling and multiple suture passes inherent to the darning technique, a finding also reported in earlier studies [14,17]. Other complications such as seroma and surgical site infection were infrequent and managed conservatively, consistent with published literature [15].

No early recurrences were observed in either group during the six-month follow-up. While encouraging, recurrence following tissue-based repairs may manifest later, emphasizing the importance of long-term follow-up [1,8]. Large cohort studies and systematic reviews have reported acceptable recurrence rates with Desarda's repair, particularly in selected patient populations and non-elective settings [18,20,22].

The findings of this study are particularly relevant in low- and middle-income settings and in clinical scenarios where mesh use is contraindicated due to infection, contamination, or cost constraints [17,18,21]. Both Desarda's and Darning repairs remain valuable options in the surgical management of inguinal hernia.

CONCLUSION

Desarda's repair demonstrated better outcomes in terms of postoperative pain and fewer complications, making it a reliable alternative in inguinal hernia repair, especially in resource-constrained or mesh-inappropriate situations [3,5,11,20]. Both Desarda and Darning repairs showed no recurrences within six months, underscoring their short-term efficacy. However, larger studies with longer follow-up are essential to fully validate these findings.

Ethics Approval and Consent to Participate

Approved by the Institutional Ethics Committee (Approval No. DHR-EC/NEW/INST/2021/2255). Written informed consent was obtained from all participants.

Conflict of Interest

The authors declare no conflict of interest.

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