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RESEARCH ARTICLE

A STUDY TO COMPARE DESARDA TECHNIQUE WITH LICHTENSTEIN TECHNIQUE FOR INGUINAL HERNIA REPAIR

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Abstract

Background: Lichtenstein tension-free mesh repair is widely used for inguinal hernia, but prosthetic material and mesh-related complications have sustained interest in non-mesh tissue repair. Desarda repair reinforces the posterior wall using an undetached strip of external oblique aponeurosis.

Aim and objectives: To compare Desarda tissue repair with Lichtenstein in mesh repair for primary unilateral inguinal hernia, evaluating operative time, early postoperative pain, complications, hospital stay, return to routine activity/work, patient satisfaction, and recurrence at six months.

Materials and Methods: This prospective comparative interventional study was conducted at Basaveshwar Teaching and General Hospital, Kalaburagi, from June 2024 to November 2025. Fifty adults with primary unilateral inguinal hernia were allocated to Desarda repair (n=25) or Lichtenstein mesh repair (n=25). Outcomes included operative time, VAS pain on postoperative days 1, 3 and 7, complications, hospital stay, return to routine activity/work and recurrence at 6 months.

Results: Mean operative time was 35.8 ± 4.5 minutes with Desarda repair and 49.6 ± 5.2 minutes with Lichtenstein repair ($p < 0.001$). VAS scores were lower after Desarda repair on postoperative day 1 (4.2 ± 1.1 vs 6.1 ± 1.3), day 3 (2.1 ± 0.8 vs 3.6 ± 1.0) and day 7 (0.9 ± 0.5 vs 1.8 ± 0.7), with $p < 0.001$ for each comparison. Overall postoperative complications occurred in 3 (12%) and 14 (56%) patients, respectively ($p = 0.002$). Mean hospital stay was 2.4 ± 0.6 versus 3.8 ± 0.9 days, and return to routine activity/work was 10.6 ± 2.1 versus 16.4 ± 3.2 days (both $p < 0.001$). Recurrence at 6 months was 0% versus 8% ($p = 0.15$).

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Conclusion: Desarda repair was associated with shorter operative time, lower early postoperative pain, fewer complications, shorter hospital stay and earlier functional recovery. Six-month recurrence did not differ significantly. Larger studies with longer follow-up are needed.

Introduction:-

An inguinal hernia is the protrusion of preperitoneal fat, a peritoneal sac, or abdominal contents through a weak area of the lower abdominal wall into the inguinal canal. It accounts for approximately 75% of abdominal wall hernias and is much more common in men; the estimated lifetime risk is about 27% in men and 3% in women [13, 18, 26]. Although many uncomplicated hernias are not immediately dangerous, they do not resolve spontaneously and require clinical assessment; incarceration or strangulation can necessitate urgent treatment [13, 18]. Lichtenstein repair is an open, tension-free mesh hernioplasty in which a prosthetic mesh reinforces the posterior wall of the inguinal canal. It is an established and widely used technique for adult inguinal hernia repair [3, 20]. Mesh repair provides durable reinforcement, but postoperative pain and other complications remain important outcomes to monitor [22, 25].

Desarda repair is a non-mesh tissue technique developed by Mohan Desarda and described in 2001. It uses an undetached strip of the patient's external oblique aponeurosis to reinforce the posterior wall of the inguinal canal, avoiding implantation of a synthetic mesh. Randomized studies and systematic reviews have compared it with Lichtenstein repair, reporting potentially favorable early recovery outcomes, although the evidence base and long-term follow-up remain important considerations [6–11, 14, 21, 29–30]. This study compared perioperative and short-term outcomes following the two techniques. The Desarda technique was developed as a tissue-based alternative in which a strip of the external oblique aponeurosis remains attached at one end and is sutured to the inguinal ligament at the other, reinforcing the posterior wall without inserting a prosthetic mesh. Its proposed advantages include avoiding a permanent foreign body and reducing mesh-related cost; however, these potential benefits must be weighed against recurrence and the reproducibility of the technique. The choice of repair should therefore be guided by patient factors, surgeon expertise, and outcomes measured over adequate follow-up [11, 14, 21, 29–30].

Postoperative pain is influenced by tissue injury, individual pain perception and perioperative analgesia. Multimodal analgesia is commonly used to improve pain control while limiting reliance on any single drug class. Because the analgesic regimen was not reported as a comparative outcome in this study, differences in pain scores should be interpreted as observed group differences rather than attributed exclusively to the operative technique. The present study compared Desarda tissue repair with Lichtenstein mesh repair in adults undergoing surgery for primary unilateral inguinal hernia at a single teaching hospital. The principal outcomes were operative duration, early postoperative pain and complications, length of hospital stay, return to routine activity or work, patient satisfaction, and recurrence during six months of follow-up. The study was intended to provide a local comparative assessment rather than establish definitive superiority of either operation.

The comparison is clinically relevant because both techniques aim to provide durable repair but differ in the material used to reinforce the posterior wall. Desarda repair uses the patient's own external oblique aponeurosis, whereas Lichtenstein repair uses polypropylene mesh. Differences in operative steps may influence operative duration, early pain, wound-related events and the time required to resume usual activities. These outcomes are particularly useful when evaluating recovery after elective open repair. Because recurrence and persistent groin pain may become apparent beyond the early postoperative period, short-term results should be interpreted cautiously. The present study therefore reports early recovery outcomes alongside recurrence at six months, while recognising that a larger sample and longer follow-up are needed to assess durability and longer-term patient-reported outcomes.

Materials and Methods:-

This prospective comparative interventional study was conducted in the Department of General Surgery, Basaveshwar Teaching and General Hospital, attached to Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, from 1 June 2024 to 30 November 2025. Participants. Adults older than 18 years with primary direct or indirect inguinal hernia were eligible. Pregnancy, morbid obesity, bilateral or recurrent inguinal hernia, and obstructed or strangulated hernia were exclusion criteria. Fifty patients were included. Allocation and procedures. The 50 patients were randomly allocated to Desarda repair (Group A, n=25) or Lichtenstein mesh repair (Group B, n=25). In the Desarda procedure, an undetached strip of external oblique aponeurosis was fashioned and sutured to reinforce the posterior wall without prosthetic mesh. In the Lichtenstein procedure, polypropylene mesh was placed

over the posterior wall and fixed to the pubic tubercle, inguinal ligament and conjoint tendon, with a slit to accommodate the spermatic cord.

Both groups underwent open inguinal hernia repair. The Desarda procedure used the patient's external oblique aponeurosis to reinforce the posterior wall, whereas the Lichtenstein procedure used a prosthetic mesh for tension-free reinforcement. The operative approach and postoperative assessment were documented in the study records. Pain was assessed with a 0–10 Visual Analogue Scale, where higher scores indicate greater pain. The recorded time points were postoperative days 1, 3, and 7. Early complications included seroma, surgical-site infection, and scrotal edema. Recurrence was assessed at six months. Return to routine activity/work was recorded in days, and patient satisfaction was recorded as a categorical outcome in the source results. Outcome assessment. Operative time, pain measured using a 0–10 Visual Analogue Scale on postoperative days 1, 3 and 7, early postoperative complications, hospital stay, time to return to routine activity/work, and recurrence at 6 months were recorded.

Statistical analysis. Data were entered in Microsoft Excel and analyzed using IBM SPSS version 25.0. Continuous variables were expressed as mean $\pm$ standard deviation and compared using the independent-samples t-test. Categorical variables were expressed as frequencies and percentages and compared using chi-square or Fisher's exact test, as appropriate. $p < 0.05$ was considered statistically significant. All tests were two-sided, and $p < 0.05$ was considered statistically significant. Results are presented as mean $\pm$ standard deviation for continuous variables and number (percentage) for categorical variables. Ethics. Ethical clearance was obtained from the Institutional Ethics Committee of Mahadevappa Rampure Medical College. Written informed consent was obtained from all participants in their vernacular language.

Results:-

Fifty patients were analyzed, with 25 in each group. Baseline age distribution and hernia type were comparable between the groups. The age distribution was similar between groups: the largest age category was 41–50 years in the Desarda group (8/25, 32%) and 51–60 years in the Lichtenstein group (8/25, 32%). Direct hernia accounted for 40% of the Desarda group and 44% of the Lichtenstein group, while indirect hernia accounted for 60% and 56%, respectively. The reported baseline comparisons did not show statistically significant differences.

Table 1. Baseline distribution of age and hernia type

Characteristic	Desarda (n=25)	Lichtenstein (n=25)	p-value
Age 18–30 years	4 (16%)	3 (12%)	0.93
Age 31–40 years	6 (24%)	7 (28%)	—
Age 41–50 years	8 (32%)	7 (28%)	—
Age 51–60 years	7 (28%)	8 (32%)	—
Direct hernia	10 (40%)	11 (44%)	0.77
Indirect hernia	15 (60%)	14 (56%)	—

Table 2. Operative and postoperative recovery outcomes

Outcome	Desarda	Lichtenstein	p-value
Operative time, min	35.8 $\pm$ 4.5	49.6 $\pm$ 5.2	<0.001
VAS, postoperative day 1	4.2 $\pm$ 1.1	6.1 $\pm$ 1.3	<0.001
VAS, postoperative day 3	2.1 $\pm$ 0.8	3.6 $\pm$ 1.0	<0.001
VAS, postoperative day 7	0.9 $\pm$ 0.5	1.8 $\pm$ 0.7	<0.001
Hospital stay, days	2.4 $\pm$ 0.6	3.8 $\pm$ 0.9	<0.001
Return to activity/work, days	10.6 $\pm$ 2.1	16.4 $\pm$ 3.2	<0.001

Table 3. Early postoperative complications and recurrence

Outcome	Desarda (n=25)	Lichtenstein (n=25)	p-value
Seroma	1 (4%)	5 (20%)	—
Surgical-site infection	0 (0%)	3 (12%)	—
Scrotal edema	2 (8%)	6 (24%)	—
Overall complications	3 (12%)	14 (56%)	0.002
Recurrence at 6 months	0 (0%)	2 (8%)	0.15

The mean operative time was approximately 14 minutes shorter with Desarda repair. Pain scores were lower at all three postoperative assessments. The overall early postoperative complication rate was significantly lower in the Desarda group. Patients in this group also had a shorter hospital stay and returned to routine activity/work earlier. The difference in recurrence at 6 months was not statistically significant. The mean operative duration was 35.8 ± 4.5 minutes in the Desarda group compared with 49.6 ± 5.2 minutes in the Lichtenstein group. Mean VAS pain scores favored Desarda repair on postoperative day 1 (4.2 ± 1.1 versus 6.1 ± 1.3), day 3 (2.1 ± 0.8 versus 3.6 ± 1.0), and day 7 (0.9 ± 0.5 versus 1.8 ± 0.7); all reported comparisons had $p < 0.001$. These results describe early postoperative pain and should not be extrapolated to chronic groin pain.

Overall early complications were recorded in 3 patients (12%) after Desarda repair and 14 patients (56%) after Lichtenstein repair ($p = 0.002$). Seroma occurred in 1 (4%) and 5 (20%) patients, surgical-site infection in 0 and 3 (12%), and scrotal edema in 2 (8%) and 6 (24%), respectively. Mean hospital stay was 2.4 ± 0.6 days after Desarda repair and 3.8 ± 0.9 days after Lichtenstein repair. Return to routine activity/work occurred at 10.6 ± 2.1 and 16.4 ± 3.2 days, respectively (both $p < 0.001$). At six months, recurrence was reported in 0 patients in the Desarda group and 2 patients (8%) in the Lichtenstein group; this difference was not statistically significant ($p = 0.15$). Patient satisfaction was reported by 23 (92%) and 18 (72%) patients, respectively ($p = 0.04$).

Across the measured recovery outcomes, the Desarda group had a mean operative time 13.8 minutes shorter than the Lichtenstein group. Mean VAS pain scores were lower at each recorded assessment (days 1, 3 and 7). The overall early complication rate differed between groups (12% versus 56%), with seroma, surgical-site infection and scrotal edema each numerically less frequent after Desarda repair. Mean hospital stay was 1.4 days shorter and return to routine activity/work occurred 5.8 days earlier in the Desarda group. Recurrence was recorded in two patients after Lichtenstein repair and none after Desarda repair; this difference was not statistically significant at six months. Satisfaction was reported by 92% and 72% of patients, respectively, as stated in the study results.

Discussion:-

Operative Time:-

Mean operative time was shorter with Desarda repair than with Lichtenstein repair (35.8 ± 4.5 vs 49.6 ± 5.2 minutes; $p < 0.001$). Avoidance of mesh handling and fixation may partly explain this difference, although surgeon experience and case complexity can also affect operative duration [21, 29–30].

Postoperative Pain:-

VAS scores were lower in the Desarda group on postoperative days 1, 3 and 7 ($p < 0.001$ at each assessment). These results indicate less early postoperative pain, but pain was not assessed beyond the first week; therefore, no conclusion can be drawn about chronic groin pain [22, 25].

Postoperative Complications:-

Overall early complications were less frequent after Desarda repair than after Lichtenstein repair (12% vs 56%; $p = 0.002$). Seroma occurred in 4% vs 20%, surgical-site infection in 0% vs 12%, and scrotal edema in 8% vs 24%, respectively. These findings suggest lower early morbidity with Desarda repair in this sample, but the small group sizes warrant caution.

Hospital Stay and Functional Recovery:-

Hospital stay was shorter with Desarda repair (2.4 ± 0.6 vs 3.8 ± 0.9 days), and return to routine activity or work was earlier (10.6 ± 2.1 vs 16.4 ± 3.2 days; $p < 0.001$ for both). Lower pain scores and fewer complications may have contributed, although discharge practices and individual recovery can also influence these outcomes [11, 14, 21, 29–30].

Recurrence:-

At six months, recurrence occurred in 0 patients after Desarda repair and 2 (8%) after Lichtenstein repair; the difference was not statistically significant ($p = 0.15$). The short follow-up and small sample do not establish comparative long-term durability. Larger studies with longer follow-up are needed [11, 14, 21, 29–30].

Patient Satisfaction and Overall Outcome:-

Satisfaction was higher in the Desarda group (92% vs 72%; $p = 0.04$). This may reflect the observed differences in early pain, complications and recovery. Satisfaction should, however, be interpreted in light of the assessment method and is not a substitute for a validated quality-of-life measure.

Clinical Significance:-

In this study, Desarda repair was associated with shorter operative time, less early pain, fewer early complications, shorter hospital stay, earlier return to activity and greater satisfaction. It may be an option for selected patients who prefer a non-mesh repair, but these findings do not support replacing Lichtenstein repair universally. Technique selection should consider patient factors, tissue quality, surgeon experience and longer-term evidence [11, 14, 16, 21, 29–30].

Limitations:-

Limitations include the small, single-center sample (25 patients per group), six-month follow-up, and absence of reported blinding and a validated quality-of-life measure. Chronic groin pain and long-term recurrence could not be adequately assessed. Larger multicenter studies with longer follow-up are needed.

Conclusion:-

In this prospective comparative study, Desarda tissue repair was associated with shorter operative time, lower early postoperative pain, fewer early complications, shorter hospital stay and earlier return to routine activity/work than Lichtenstein mesh repair. Six-month recurrence was low in both groups, without a statistically significant difference. Larger multicenter studies with longer follow-up are required to assess durability, chronic pain and patient-reported outcomes.

Summary:-

Desarda repair was associated with shorter operative time and lower early postoperative pain scores than Lichtenstein repair in this study.

Early postoperative complications, hospital stay and time to return to routine activity/work were lower or shorter in the Desarda group.

Six-month recurrence did not differ significantly between groups; the sample size and follow-up duration limit conclusions about long-term durability.

The findings support further evaluation in larger studies and do not establish universal superiority of either technique.

Ethical approval and consent:-

Ethical approval was obtained from the Institutional Ethics Committee of Mahadevappa Rampure Medical College. Written informed consent was obtained from all participants in their vernacular language.

Funding:-

No external funding

Conflict of Interest:-

None

Surgical Photographs**Desarda Procedure I**

1.Skin cut for 2-3 inches to expose the external oblique aponeurosis (EOA)



2.EOA cut to expose inguinal canal and hernia sac excised



3.External oblique aponeurosis cut and upper leaf sutured to inguinal ligament



4.Incision taken in sutured leaf



5.EOA strip is separated



6.Upper border of strip stitched to muscle arch to form new floor



7. Lower leaf and newly formed upper leaf of external oblique aponeurosis sutured in front of cord



8. External oblique aponeurosis closed and skin will be sutured in front

Desarda Procedure II:-



1. After skin incision subcutaneous tissue separated



2. Cord structures identified and separated



3.Hernia sac identified and separated from cord structures



4.Contents of sac reduced and redundant sac twisted transfixed



5.Medial or superior flap sutured to reflected part of inguinal ligament to form a strip of EOA

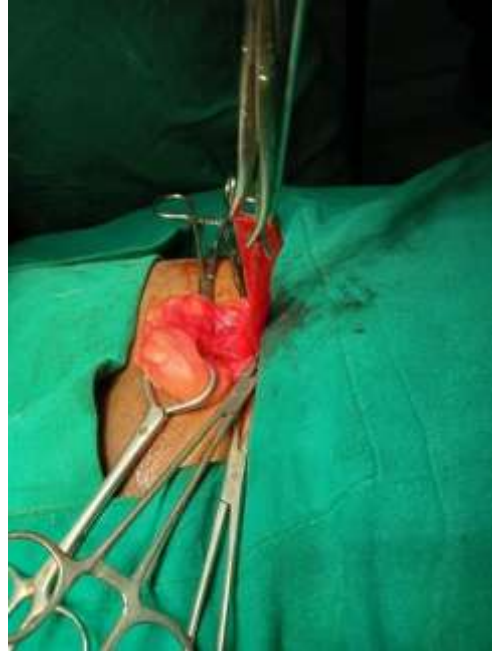


6.Newly formed upper leaf sutured to lower leaf

Desarda Procedure Iii:-



1.Cord and cord structures identified and separated



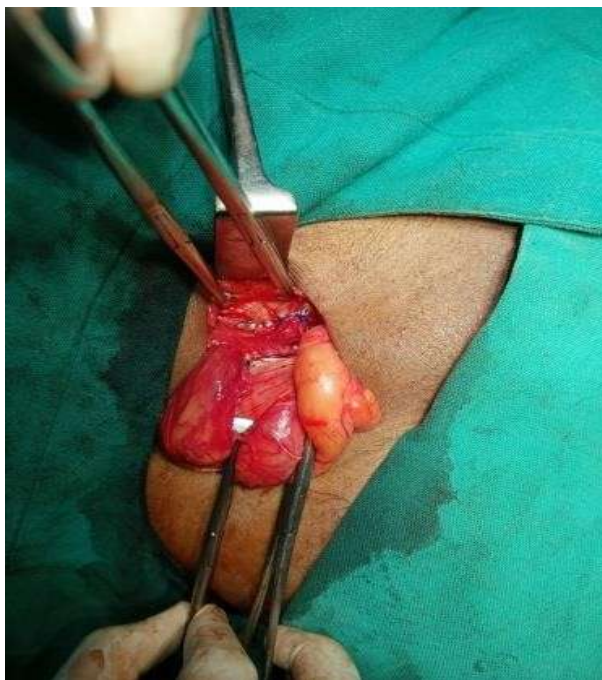
2.Hernial sac separated from cord structures



3.Upper leaf sutured to reflected part of inguinal ligament



4.Strip of EOA created by taking an incision in the upper leaf



5.Upper border of new strip sutured to conjoint tendon to form new floor

Lichtenstein Procedure I:-



1.Skin incision for repair of left inguinal hernia



2.Exposed left inguinal canal after cutting of external oblique aponeurosis



3. Spermatic cord was mobilized and elevated from posterior surface of inguinal canal



4. Hernia sac identified and isolated from spermatic cord and nerve



5. Hernia sac was isolated, content of sac reduced and preparing for herniotomy

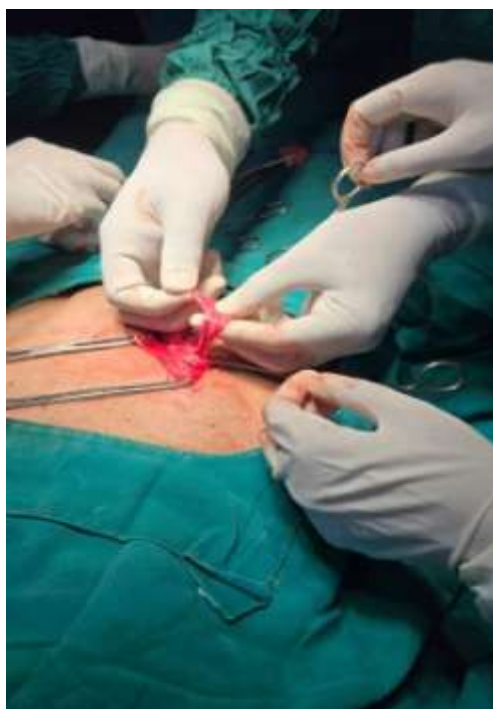


6. Hernial sac was ligated at neck and herniotomy to be performed



7. Polypropylene mesh placed on posterior wall of inguinal canal and fixed with polypropylene suture; divided both limbs of mesh were crossed in opposite direction and fixed

Lichtenstein Procedure Ii:-



1. Sac is identified in front of the cord structures



2. Sac separated from cord structures



3.Hernia sac contents reduced



4.Redundant sac twisted and excised



5.Mesh placed over the posterior wall and fixed



6.External oblique aponeurosis sutured

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