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Desarda Non-Mesh Technique Versus Lichtenstein Technique for the Treatment of Inguinal Hernias: A Comparative Study of Operative Outcomes and Postoperative Recovery.

Dr. Shalabh Gupta[1], Dr. Hari Mohan[2], Dr. Akshita Gupta[3], Dr. Ankit Kumar[4*], Dr. Ajeet Yadav[5].

[1]MBBS, MS Professor and Head Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh 201001, India.

[2]Professor Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

[3]Assistant Professor Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

[4]Surgery Resident Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

[5]Assistant Professor Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

Correspondence:
Dr. Ankit Kumar.
Surgery Resident Department of General Surgery Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

Email: ajeetrocks@gmail.com

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Abstract

Background: Inguinal hernia repair is one of the most common general surgical procedures done around the world. The Lichtenstein tension-free mesh repair is the standard technique, but with concerns regarding mesh-related morbidity, such as chronic groin pain, foreign-body sensation, stiffness, and cost, there is renewed interest in non-mesh, tissue-based repairs. The Desarda technique is a physiologic alternative to strengthen the posterior wall of the inguinal canal using an undetached strip of external oblique aponeurosis without prosthetic material. The objective of this study was to compare the outcome and complication profile of the Desarda and Lichtenstein techniques in patients with uncomplicated primary inguinal hernia. ***Methods:*** This hospital-based observational study was conducted in the Department of General Surgery at Santosh Medical College and Hospital. A total of 72 patients with uncomplicated primary inguinal hernia were included and randomised into two equal groups: 36 underwent Desarda repair, and 36 underwent Lichtenstein repair. We included patients aged 18–65 years with reducible inguinal hernia and excluded those with obstructed, irreducible or strangulated hernia, those with weak or divided external oblique aponeurosis, and those unfit for surgery. The primary outcomes were operation time, postoperative pain (Visual Analogue Scale at 6 h, 24 h, 48 h, 1 week, 3 weeks, and 3 months), analgesic consumption, time to return to normal activity and work, length of hospital stay, postoperative complications, and short-term recurrence (<6 months). Data analysis was done using SPSS version 25. $p < 0.05$ was considered statistically significant. ***Results:*** Baseline demographic and hernia characteristics were similar between the two groups (mean age 43.39 ± 14.48 vs. 46.47 ± 16.21 years; $p = 0.39$). Mean operative time was significantly shorter in the Desarda repair group (75.92 ± 17.12 vs 95.19 ± 29.36 minutes; $P = 0.001$). VAS pain scores were consistently lower in the Desarda group at all intervals ($p < 0.001$) with significantly lower total analgesic requirement (361.11 ± 109.49 vs. 663.19 ± 373.26 mg; $p < 0.001$). Patients in the Desarda group resumed normal activity earlier (1.17 ± 0.44 vs. 2.31 ± 0.62 days; $p < 0.001$) and returned to work earlier (11.75 ± 1.51 vs. 14.94 ± 3.46 days; $p < 0.001$). Duration of hospital stay was similar (2.94 ± 0.41 vs 3.31 ± 1.28 days; $p = 0.58$). Chronic inguinodynia, numbness, stiffness, and epididymo-orchitis were only present in the Lichtenstein group and significantly more frequent ($p<0.01$) for numbness. In both groups, there were no short-term recurrences. ***Conclusions:*** Desarda non-mesh repair is a safe and effective substitute for Lichtenstein repair for uncomplicated primary inguinal hernia, with benefits of shorter operative time, less postoperative pain and analgesic use, faster functional recovery, and fewer chronic mesh-related complications with comparable hospital stay and short-term recurrence. It is especially suited for resource-limited settings and patients who prefer mesh avoidance.

Keywords: Inguinal hernia; Desarda repair; Lichtenstein repair; non-mesh repair; postoperative pain; recurrence.

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INTRODUCTION

Inguinal hernia repair is one of the most common operations performed in general surgery and constitutes a major part of elective surgical workload in healthcare systems worldwide. Millions of groin hernia repairs are performed annually worldwide, and the choice of operative technique has important consequences for postoperative recovery, chronic groin

pain, recurrence rates, cost of treatment, and overall use of healthcare resources (1–3). Based on evolving evidence on recurrence, postoperative pain, and complication profiles, a variety of operative strategies including classical open tissue repairs (eg, Bassini and Shouldice techniques), tension-free mesh repairs, and minimally invasive laparoscopic approaches have been developed and adopted over the years (4–7).

The introduction of the Lichtenstein tension-free mesh repair was a major milestone in the surgery of inguinal hernia. This technique achieved a significant reduction in recurrence rates compared to conventional tissue repairs by reinforcing the posterior wall of the inguinal canal with prosthetic mesh. This technique achieved a substantial reduction in recurrence rates compared with traditional suture-based tissue repairs, while remaining technically simple, reproducible, and associated with a relatively short learning curve (5,8). Mesh hernioplasty is therefore the reference technique widely accepted among surgeons, and the current practice guidelines recommend mesh-based repair for most primary inguinal hernias due to the favorable long-term outcomes and ease of the procedure (3,5). Despite such advantages, the use of prosthetic mesh has some drawbacks, including foreign-body sensation, chronic groin pain in a subset of patients, risk of mesh-related infection, especially in contaminated surgical fields, and an increased procedural cost. These concerns have renewed interest in non-mesh, tissue-based repair techniques in selected clinical settings (5,9–11).

In this regard, a new non-mesh technique of inguinal hernia repair called the Desarda technique was introduced in 2001. This technique uses an undetached strip of the external oblique aponeurosis to obtain a dynamic and physiologic reinforcement of the posterior wall of the inguinal canal without prosthetic material (12). The Desarda repair has been proposed as a simple, inexpensive, and anatomically sound alternative to mesh-based techniques, more appropriate for younger patients, those in whom mesh use is not desirable or contraindicated and in resource-poor settings (12,13). The proposed advantages include maintenance of native tissue planes and neural structures, removal of foreign material, reduction in operative time and early postoperative recovery, and early clinical series have reported low recurrence rates during short- and medium-term follow-up (13–16).

Since its introduction, several randomized controlled trials and observational studies have compared the Desarda repair with the Lichtenstein mesh technique. Early randomized trials, mainly from single centers, showed similar short-term recurrence rates for the two approaches, although some showed lower early post-operative pain scores, shorter hospital stay, and earlier return to normal activities after Desarda repair (14,17,18). More recent systematic reviews and meta-analyses aggregating all available randomized and non-randomized data have generally found that Desarda repair yields equivalent short-term results compared to Lichtenstein repair for most parameters and potentially reduced early postoperative pain and foreign-body sensation, and earlier return to work. There is considerable variation in study design, sample size, outcome definition and follow-up duration, however, which restricts the ability to conclude long-term recurrence and chronic groin pain (19–22).

Though there has been an increasing interest in the Desarda technique, there are some important gaps in the existing literature. While there are some short-term benefits, like decreased early postoperative pain and speed of recovery, there is limited and inconsistent follow-up beyond 3-5 years (19,21). Furthermore, numerous published studies are based on data from a single center, with patients with different selection criteria and peri-operative protocols, which can reduce generalizability of results (14,17,18). There are also few cost-effectiveness analyses and evaluations of the technique in contaminated or emergency hernia situations, which are relevant in low-resource areas where the availability of mesh, cost, and sterilization may be a problem (11,16,20). In addition, comparative effectiveness of different procedures needs elucidation for a number of factors, including surgeon experience, patient-reported outcomes (such as quality of life and chronic pain), and hernia type and defect size.

Given these factors, a careful and evidence-based comparison of Desarda non-mesh repair and Lichtenstein mesh hernioplasty with respect to pre- and post-operative aspects, early and chronic post-operative pain, short-term recurrence, complication rates, and patient-reported recovery parameters is warranted. This comparative information has significance in certain areas where cost factors and mesh availability play a role in the decision for surgery, and patient subpopulations where avoiding the use of a prosthetic material is preferred. Therefore, the present study was carried out to compare the results and complications of both Desarda and Lichtenstein tension-free mesh repair in patients with uncomplicated primary inguinal hernia with respect to operative time, pain, analgesic requirement, return to normal activity and to work, hospital stay, chronic groin pain, and short-term recurrence rates in both groups and between the two groups.

MATERIALS AND METHODS

Study Design and Setting

This is a hospital-based observational study conducted in the Department of General Surgery, Santosh Medical College and Hospital, Ghaziabad (U.P.), India. The study protocol was approved by the Institutional Ethics Committee of Santosh

Deemed to be University before its commencement, and was conducted as per the ethical principles of the Declaration of Helsinki. All participants signed informed consent forms before their enrollment.

Study Population

A total of 72 patients with uncomplicated primary inguinal hernia were enrolled and randomized into two groups of 36 patients each: Group D (Desarda repair) and Group L (Lichtenstein repair).

Inclusion criteria were: (i) patients with unilateral or bilateral inguinal hernia in whom only one side was planned for operation; (ii) reducible inguinal hernia; and (iii) patients aged 18–65 years who were fit for surgery.

Exclusion criteria were: (i) refusal to participate in the study; (ii) divided, tiny, or weak external oblique aponeurosis; (iii) obstructed, irreducible, or strangulated hernia; and (iv) patients unfit for surgery.

Preoperative Evaluation

A thorough history, general physical examination, and local examination of the patients were performed in addition to their routine investigations as a prerequisite for spinal anaesthesia. Patients with lower urinary tract obstructive symptoms underwent further evaluation by uroflowmetry and ultrasonography of the kidney, ureter, and bladder with estimation of post-voided residual urine to exclude bladder outlet obstruction (BOO), which, if present, was treated before hernia repair. All patients were preoperatively taught the Visual Analogue Scale (VAS), which ranges from 0 (no pain) to 10 (worst pain imaginable), and this was used for postoperative pain charting. Part preparation for pre-op was done from the umbilicus to mid-thigh. Injection Amoxiclav was given at 6:00 am on the day of surgery (test dose), and 1.2 g of the antibiotic was given 30 minutes prior to skin incision (prophylactic dose). No patients were catheterized, and all were asked to empty the bladder immediately before transfer to the operating theatre.

Randomization

Sequentially numbered, sealed opaque envelopes (SNOO) were used to randomize the procedure just prior to surgery. For bilateral hernias, each side was independently evaluated for operating time, chronic inguinodynia, complications, and short-term recurrence.

Operative Technique

All procedures were performed under spinal anaesthesia by the surgeons in the Department of General Surgery.

Lichtenstein Technique

A groin incision was made to expose the inguinal canal, and the external oblique aponeurosis was cut along the incision. Direct hernia sacs were reduced into the peritoneal cavity. For indirect hernias, the sac was separated from the cord structures up to the deep ring, the contents were reduced and the sac was tied at the neck. Repair was done with one of polypropylene mesh (at least 10–15 cm), sutured at least 2 cm beyond the pubic tubercle medially. A continuous non-absorbable monofilament suture was used to fix the inferior edge of the mesh to the shelving inturned edge of the inguinal ligament up to a point 2 cm lateral to the internal ring. A slit was cut through the mesh to enable the cord structures to pass, separating the mesh into a top two-thirds tail and a bottom one-third tail. Sutures were interrupted to secure the mesh in the superior direction, avoiding any nerves. The tails of the mesh were inserted evenly into the external oblique laterally. The external oblique aponeurosis was closed over the cord structures, and the skin was stitched.

Desarda Repair

A groin incision was used to open the inguinal canal, which involved mobilization of the upper and lower leaves of the external oblique aponeurosis (EOA). The hernia sac was treated as outlined for the Lichtenstein repair and the cord structures were lateralized. As far as possible the thin fascial layers over the EOA were preserved. The aponeurotic extensions of the muscle of the same name were brought together to reinforce the posterior wall of the inguinal canal where they were missing. The first two sutures were placed through the anterior rectus sheath and the last suture was taken through the inguinal ligament inguinally, making sure it was tight enough to close the deep ring, but not so tight as to cause constriction. A 2-cm strip of EOA was made from the sutured medial leaf with its lower border already sutured to the inguinal ligament—its lateral and medial borders left intact, using a splitting incision that extended 1–2 cm beyond the deep ring. This upper free edge of the strip was sutured to the conjoint muscle with interrupted No. 1 monofilament polydioxanone suture, thus forming a new posterior wall behind the cord. The cord was inserted in the canal, and the inferior leaf of the EOA was sutured in front of the cord to the newly formed superior leaf. Skin was sutured as normal.

Surgical protocol and follow-up:

All patients were examined on the evening of surgery by the operating surgeon for general condition and postoperative complications such as haematoma and scrotal oedema. All patients received an injection of diclofenac 75 mg immediately

after surgery, at 8:00 p.m. on the day of surgery, and at 6:00 a.m. on postoperative day 1; any additional requirement was recorded. Amoxicillin–clavulanic acid 1.2 g was administered on the day of surgery at 4:00 p.m. and 10:00 p.m., and no more oral or parenteral antibiotics were given after that. Patients were encouraged to get up and walk around for the first postoperative day. Patients were discharged if they had tolerable pain on oral analgesics and could walk without difficulty, and were prescribed diclofenac 75 mg orally twice daily for 3 days for pain relief. Patients were asked to document any further painkiller use, and this was recorded during subsequent visits. Follow-up visits were scheduled at 7 days after surgery, 21 days after surgery, and 3 months after surgery, with sutures removed at 7 days postoperatively. There were 36 patients in each group (n = 36/Group), and both groups were included in the final analysis.

Outcome Measures

The following parameters were measured:

Postoperative pain scale (0 = no pain; 10 = unbearable pain) measured at 6 h, 24 h, 1 week, 3 weeks and 3 months after surgery.

Analgesics: The total dose of analgesics required.

Return to normal day-to-day activities (e.g., bathing, brushing).

Hospital stay (days).

Time to return to work (TTR): Time to complete return to preoperative level of function.

Chronic inguinodynia: pain, stiffness and/or foreign-body feeling in the groin at 3 months post-surgery.

Short-term recurrence (less than 6 months): Any bulge visible and/or palpable at the hernia site.

Complications: Haematoma, scrotal œdema, epididymo-orchitis and surgical site infection.

Statistical Analysis

Data were entered into the Microsoft Excel spreadsheet and analyzed in SPSS (version 25, IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov test was used to determine the normality of all the variables. Normally distributed quantitative variables were expressed as mean ± standard deviation and compared between the two independent groups using the unpaired Student's t-test. Non-normally distributed variables were compared using the Mann–Whitney U test. Categorical variables were expressed as frequencies and percentages and compared using the chi-square test or Fisher's exact test, as appropriate. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 72 patients with uncomplicated primary inguinal hernia were included in the study, with 36 patients in the Desarda repair group and 36 patients in the Lichtenstein repair group. Both groups were comparable with respect to baseline demographic and hernia characteristics.

Baseline Characteristics

The majority of patients in both groups belonged to the 41–60-year age group (47.2% in the Desarda group and 38.9% in the Lichtenstein group). The mean age was 43.39 ± 14.48 years in the Desarda group and 46.47 ± 16.21 years in the Lichtenstein group, with no statistically significant difference between the groups (p = 0.39). Left-sided inguinal hernia was the most common presentation in both groups, accounting for 50.0% of cases in each group, followed by right-sided hernia (47.2% and 41.7%, respectively) and bilateral hernia (2.8% and 8.3%, respectively); the difference in hernia laterality was not statistically significant (p = 0.57). Direct hernia was the most common type in both groups (47.2% and 41.7%, respectively), followed closely by indirect hernia (44.4% and 47.2%, respectively), with pantaloon hernia constituting a small proportion of cases (8.3% and 11.1%, respectively); the distribution of hernia types did not differ significantly between the groups (p = 0.86). These findings confirm that the two groups were well matched at baseline (**Table 1**).

Table 1: Baseline demographic and hernia characteristics of the study population

Characteristic	Desarda Group (n = 36)	Lichtenstein Group (n = 36)	p-value
Age group			
Up to 20 years	1 (2.8%)	2 (5.6%)	0.40
21–40 years	14 (38.9%)	11 (30.6%)	
41–60 years	17 (47.2%)	14 (38.9%)	
61–80 years	4 (11.1%)	9 (25.0%)	
Mean age (years)	43.39 ± 14.48	46.47 ± 16.21	0.39
Side of hernia			
Left	18 (50.0%)	18 (50.0%)	0.57
Right	17 (47.2%)	15 (41.7%)	
Bilateral	1 (2.8%)	3 (8.3%)	

Type of hernia			
Direct	17 (47.2%)	15 (41.7%)	0.86
Indirect	16 (44.4%)	17 (47.2%)	
Pantaloon	3 (8.3%)	4 (11.1%)	

Operative and Postoperative Outcomes

The duration of surgery differed significantly between the two groups (**Table 2**). A majority of patients in the Desarda group had operative times of less than 90 minutes, whereas more than half of the patients in the Lichtenstein group (58.3%) required more than 90 minutes. The mean duration of surgery was 75.92 ± 17.12 minutes in the Desarda group compared with 95.19 ± 29.36 minutes in the Lichtenstein group, a difference that was statistically significant (p = 0.001). The mean duration of hospital stay was slightly shorter in the Desarda group (2.94 ± 0.41 days) than in the Lichtenstein group (3.31 ± 1.28 days); however, this difference was not statistically significant (p = 0.58), indicating comparable postoperative hospitalization between the two groups.

Table 2: Operative duration and hospital stay in both groups

Parameter	**Desarda Group (n = 36)**	**Lichtenstein Group (n = 36)**	**p-value**
Duration of surgery			
45–60 minutes	9 (25.0%)	6 (16.7%)	—
61–75 minutes	13 (36.1%)	5 (13.9%)	
76–90 minutes	11 (30.6%)	4 (11.1%)	
>90 minutes	3 (8.3%)	21 (58.3%)	
Mean duration of surgery (minutes)	75.92 ± 17.12	95.19 ± 29.36	0.001
Mean hospital stay (days)	2.94 ± 0.41	3.31 ± 1.28	0.58

Postoperative Pain and Analgesic Requirement

Postoperative pain scores, assessed using the VAS, were consistently lower in the Desarda repair group at all evaluated time points (**Table 3**). At 6 hours after surgery, the mean VAS score was 4.67 ± 0.53 in the Desarda group versus 5.61 ± 0.68 in the Lichtenstein group; at 24 hours, 3.83 ± 0.69 versus 5.33 ± 0.67; at 48 hours, 2.67 ± 0.71 versus 3.75 ± 1.02; at 1 week, 1.69 ± 0.57 versus 2.53 ± 0.77; at 3 weeks, 0.61 ± 0.54 versus 1.89 ± 0.85; and at 3 months, 0.11 ± 0.39 versus 1.28 ± 0.56. The differences between the groups were statistically significant at every time point (p < 0.001 for all comparisons), indicating superior postoperative pain control following Desarda repair. Consistent with these findings, the total postoperative analgesic requirement was significantly lower in the Desarda group (361.11 ± 109.49 mg) than in the Lichtenstein group (663.19 ± 373.26 mg), a highly statistically significant difference (p < 0.001).

Table 3: Postoperative pain scores and analgesic requirement in both groups

Parameter	**Desarda Group (n = 36)**	**Lichtenstein Group (n = 36)**	**p-value**
Mean VAS score			
6 hours	4.67 ± 0.53	5.61 ± 0.68	<0.001
24 hours	3.83 ± 0.69	5.33 ± 0.67	<0.001
48 hours	2.67 ± 0.71	3.75 ± 1.02	<0.001
1 week	1.69 ± 0.57	2.53 ± 0.77	<0.001
3 weeks	0.61 ± 0.54	1.89 ± 0.85	<0.001
3 months	0.11 ± 0.39	1.28 ± 0.56	<0.001
Mean total analgesic dose (mg)	361.11 ± 109.49	663.19 ± 373.26	<0.001

Functional Recovery

Patients who underwent Desarda repair returned to normal activities significantly earlier than those who underwent Lichtenstein repair (**Table 4**). The majority of patients in the Desarda group (86.1%) resumed normal activity within one day, whereas most patients in the Lichtenstein group required two or more days. The mean time to return to normal activity was 1.17 ± 0.44 days in the Desarda group compared with 2.31 ± 0.62 days in the Lichtenstein group (p < 0.001). A significantly earlier return to work was likewise observed in the Desarda group: nearly all patients (97.2%) resumed work within 10–14 days, whereas more than half of the patients in the Lichtenstein group returned to work after 15 days. The mean time to return to work was 11.75 ± 1.51 days in the Desarda group versus 14.94 ± 3.46 days in the Lichtenstein group (p < 0.001).

Table 4: Time to return to normal activity and work in both groups

Parameter	Desarda Group (n = 36)	Lichtenstein Group (n = 36)	p-value
Time to return to normal activity			
1 day	31 (86.1%)	2 (5.6%)	—
2 days	4 (11.1%)	22 (61.1%)	
3 days	1 (2.8%)	11 (30.6%)	
4 days	0 (0.0%)	1 (2.8%)	
Mean time to return to normal activity (days)	1.17 ± 0.44	2.31 ± 0.62	<0.001
Time to return to work			
10–14 days	35 (97.2%)	14 (38.9%)	—
15–18 days	1 (2.8%)	19 (52.8%)	
>18 days	0 (0.0%)	3 (8.3%)	
Mean time to return to work (days)	11.75 ± 1.51	14.94 ± 3.46	<0.001

Postoperative Complications and Recurrence

Postoperative complications were fewer in the Desarda repair group than in the Lichtenstein repair group (**Table 5**). Scrotal oedema occurred in both groups but was more frequent after Lichtenstein repair (25.0% vs. 13.9%); the difference was not statistically significant ($p = 0.23$). Chronic inguinodynia (8.3%), epididymo-orchitis (13.9%), numbness (22.2%), and stiffness (8.3%) were observed exclusively in the Lichtenstein group. Among these, postoperative numbness was significantly more common in the Lichtenstein group ($p < 0.01$), while epididymo-orchitis showed a borderline association ($p = 0.05$). No cases of haematoma or surgical site infection were observed in either group. No short-term recurrence (within 6 months) was observed in either group during the follow-up period.

Table 5: Postoperative complications in both groups

Complication	Desarda Group (n = 36)	Lichtenstein Group (n = 36)	p-value
Haematoma	0 (0.0%)	0 (0.0%)	—
Scrotal oedema	5 (13.9%)	9 (25.0%)	0.23
Chronic inguinodynia	0 (0.0%)	3 (8.3%)	0.23
Surgical site infection	0 (0.0%)	0 (0.0%)	—
Epididymo-orchitis	0 (0.0%)	5 (13.9%)	0.05
Numbness	0 (0.0%)	8 (22.2%)	<0.01
Stiffness	0 (0.0%)	3 (8.3%)	0.23

DISCUSSION

Inguinal hernia repair continues to constitute a substantial proportion of elective general surgical procedures globally. The Lichtenstein tension-free repair has become a standard repair, but an awareness of the adverse effects of the mesh (foreign-body sensation, chronic groin pain, cost) has stimulated renewed interest in non-mesh, tissue-based repairs (5,8,9). To address these concerns, the Desarda repair, in which an undetached strip of the external oblique aponeurosis is used to create a dynamic posterior wall without the use of a prosthetic material, was developed (12). Therefore, the present study was undertaken to assess the efficacy and complication profile of the Desarda repair versus Lichtenstein mesh hernioplasty. The results suggest that the non-mesh repair procedure has valuable benefits in terms of efficiency of surgery, comfort after surgery, functional recovery, and the same degree of safety as the mesh repair.

There were no significant demographic differences between the two groups (age, laterality, or hernia type), and the baseline hernia characteristics were similar, which further supports intergroup comparisons. The mean age of patients who underwent Desarda repair was 43.39 ± 14.48 years, similar to the mean age of patients who underwent Lichtenstein repair of 46.47 ± 16.21 years, which is similar to what has been found in other published studies (mean ages of 42–48 years in both groups) (15,17). In both groups, there were more left-sided hernias as compared with earlier reports, which indicated that left-sided hernias occurred in about 52%, right-sided hernias in 44%, and bilateral hernias in 4% of the cases (23); other comparative data showed an almost equal distribution between the two sides (14). As far as the type of hernia, direct hernias were slightly more common than indirect hernias in both groups, as reported in around 49% and 46% of cases, respectively (15); some cohorts have reported that indirect hernias were the more common type (18). These similarities indicate that both techniques are commonly employed in a comparable adult population and reinforce the baseline equivalence of the study groups.

One of the most important results of the present study was the significantly shorter operative time obtained with Desarda repair. The mean duration of surgery was 75.92 ± 17.12 minutes for Desarda repair compared with 95.19 ± 29.36 minutes

for Lichtenstein repair (p = 0.001). This time is consistent with published findings reporting a mean operative time of 50–54 minutes for the Desarda repair and 68–71 minutes for the Lichtenstein repair (15,17) and with comparative data showing a shorter operative time for the Desarda repair (47 ± 8 minutes) than for mesh repair (65 ± 10 minutes) (24). This decreased operative time may be due to avoidance of mesh placement, fixation, and large dissection. Some studies, however, have failed to confirm this benefit, with operative duration being similar between the two procedures in some (14) and with a mean operative time of 51.33 versus 57.33 minutes in favour of the Desarda procedure (p = 0.018) (25) in a randomized comparison.

Patient satisfaction and recovery were significantly influenced by postoperative pain. In the present study, VAS scores in the Desarda group were consistently lower at all assessed postoperative intervals (6 hours, 24 hours, 48 hours, 1 week, 3 weeks, and 3 months), with statistically significant differences between the two groups at each time point (p < 0.001). These results were corroborated by previous studies reporting that the Desarda group had lower VAS scores at 24 hours (3.1 ± 0.9 vs. 4.8 ± 1.1) and 1 week (1.6 ± 0.5 vs. 2.9 ± 0.8) after repair compared to the Lichtenstein group (17) and lower pain scores at 24 hours and 1 month after repair (15). A significantly lower mean VAS on the first postoperative day after Desarda repair (2.86 vs. 3.50; p = 0.0004) has also been reported (26), with greater immediate postoperative pain intensity and chronic groin pain at one year in the mesh group (but in none of the Desarda patients) (27) and with minimal pain following Desarda repair compared with enduring pain in the mesh group at three months (23). The excellent pain rating experienced with Desarda repair can be reasonably attributed to the lack of any foreign-body reaction or consequences of inflammation and fibrogenesis, minimal risk of nerve entrapment and nerve irritation, and maintenance of the normal anatomical arrangement of tissues (9,10). This is also supported by the present study, where the total requirement of analgesics was found to be significantly lower (361.11 ± 109.49 mg vs. 663.19 ± 373.26 mg; p < 0.001) in the Desarda group, reflecting the literature reports of about 40% reduced requirement of analgesics (24) and only 28% of Desarda patients requiring analgesics after 48 hours compared with 62% of the mesh repair group (18).

Return to normal activity is an important measure of functional recovery. In the present study, patients undergoing Desarda repair resumed routine activities significantly earlier (1.17 ± 0.44 days vs. 2.31 ± 0.62 days; p < 0.001) and returned to work sooner (11.75 ± 1.51 days vs. 14.94 ± 3.46 days; p < 0.001). Similar results have been reported, showing that return to normal activity was earlier after Desarda repair (1.2 days) than after mesh repair (2.8 days) (17); and that ambulation and recovery after Desarda repair were earlier than recovery after mesh repair (28); and that return to basic physical activity (7.04 vs. 11.30 days; p < 0.0001) (26) was earlier in the Desarda group in both randomized and observational comparisons (14,23). These benefits are socio-economic in nature, especially for the working age population. The length of the hospital stay was slightly shorter in the Desarda group (2.94 ± 0.41 days vs. 3.31 ± 1.28 days), but this difference was not statistically significant, and as reported, 2–3 days for both techniques (15,18) and slightly shorter in some series following Desarda repair (28) makes both procedures suitable for short inpatient treatment in uncomplicated cases.

There was a lower overall complication rate in the Desarda group. Scrotal oedema was noted in both groups, but was more common after Lichtenstein repair, and chronic inguinodynia, epididymo-orchitis, numbness, and stiffness occurred only in the mesh repair group, with postoperative numbness being significantly more common (p < 0.01). These observations are consistent with the reports by others of a higher incidence of chronic groin pain after Lichtenstein repair than after Desarda repair (11.4% versus 2.1%) (14) and of an overall significantly lower risk of postoperative complications, seroma, and surgical site infection with Desarda repair (22); also, with the suggestion that the sensory disturbance may be related to nerve entrapment and mesh-related fibrosis (15). Taken together, these results suggest that this type of surgical reconstruction without using any prosthetic material has a lower inflammatory and fibrotic morbidity, and both surgical methods are safe when conducted under strict aseptic conditions, as there was no surgical site infection or hematoma in either group in the present study.

There were no short-term follow-up recurrences in either group. With longer follow-up, there would be better evidence to support low recurrence with Desarda repair; the original descriptions of Desarda repair by the authors of the procedure (12) had recurrence rates comparable to Lichtenstein repair, and in one study at three-year follow-up, recurrence was equivalent (14). There have been several systematic reviews and meta-analyses reporting that there is no statistically significant difference in recurrence in the two techniques (19,22,29), and a lower rate of postoperative seroma after the Desarda technique (29).

Clinically relevant implications arise from these findings. Desarda repair is a safe, non-mesh, physiologic option that is comparable to Lichtenstein tension-free mesh repair and has been shown to have several advantages, including shorter operative time, decreased postoperative pain, faster recovery times, and lower rates of chronic morbidity. It can then be considered a useful tool in certain patients, such as those for whom use of a mesh is not desirable or feasible due to cost and availability. Given the lack of prosthetic material, Desarda repair seems particularly suitable in resource-limited areas, where the availability or cost of mesh or its sterilization may be problematic (11,16), and in patients with a higher risk of

mesh-related complications or who prefer no foreign body to be implanted in their body. Lichtenstein mesh repair should, however, continue to be considered in selected situations such as large hernia defects, poor quality or weak external oblique aponeurosis, or recurrent hernias, where additional reinforcement with mesh may be advantageous.

The present study has certain limitations. It was a single-center, hospital-based observational study with a relatively small sample of 72 patients, which may limit the generalizability of the findings. The follow-up period was short (up to 3 months for pain assessment, with recurrence evaluated within 6 months), which is insufficient to draw definitive conclusions about long-term recurrence and chronic groin pain. Assessments of outcomes such as pain and return to activity may be subject to observer and patient-related variability. Patients with weak or divided external oblique aponeurosis were excluded, so the findings apply primarily to uncomplicated primary inguinal hernias. In addition, cost-effectiveness analysis and formal quality-of-life assessment were not performed. Further multicenter, large-scale randomized controlled trials with longer follow-up are recommended to assess long-term recurrence rates and the durability of Desarda repair. Future research should also focus on patient-reported outcomes, including quality of life, cost-effectiveness, and patient satisfaction, to better delineate the role of Desarda repair in contemporary inguinal hernia surgery.

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