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Outcome of Desarda Technique versus Lichtenstein Repair in The Treatment of Primary Inguinal Hernia

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ABSTRACT
Background: Inguinal hernia repair is a pillar of general surgery procedures.
Objective: The study aimed to compare Desarda repair for primary inguinal hernia with the Lichtenstein repair
Methodology: 158 out of 196 patients with 1ry inguinal hernia were allocated to have repair with the Desarda technique or Lichtenstein one and completed a 5-year follow-up and underwent analysis for postoperative complications, recurrence, chronic pain, and abdominal wall stiffness.
Results: The mean age was 39.8±10.1in the **Lichtenstein** group while it was 41.3±9.7 in the other group. No reported significant difference between the 2 study arms as regards inguinal hematoma and ecchymosis, while seroma, testicular edema, and surgical site infection (SSI) were statistically higher in patients who underwent Desarda repair. For long-term follow-up, no significant difference between both study limbs was found as regards recurrence, although loss or change in sensation, abdominal wall stiffness, and Foreign Body (FB) sensation were more evident in the L Group .
Conclusion: In terms of recurrence, hematoma, and interval to resume regular daily activities or jobs, the outcomes of the Desarda and Lichtenstein procedures were shown to be similar. Furthermore, Desarda outperformed Lichtenstein in lowering problems such seroma development and SSI that were linked to the presence of the mesh.
Keywords: Desarda technique, Lichtenstein technique inguinal hernia.

INTRODUCTION

More than 20 million inguinal hernia repairs are done yearly, making it among the most common procedures in the world [1]. Groin hernias affect 27–43% of men during their lifetimes. Surgery is the cornerstone treatment for inguinal hernias, which are almost symptomatic [2]. Most of the time, surgical treatment is successful. However, 10–15% of patients require reoperations due to recurrences, and 10–12% of patients experience long-term incapacity as a result of chronic pain (pain that lasts longer than three months). Severe persistent pain affects 1–3% of people. Health and healthcare expenses are severely harmed by this on a global scale [3].

Treatment for groin hernias is not standardized at this time. In order to improve care and the training of surgeons who treat groin hernias, three hernia associations have independently released guidelines. The European Hernia Society (EHS) released guidelines in 2009 that addressed every facet of treating adult patients with inguinal hernias. In 2014, the EHS guidelines underwent an update [4,5].

There is no "best repair method", as evidenced by the wide variety of repairs that are being performed. Significant variances in treatment outcomes are also caused by cultural differences among surgeons, disparities in reimbursement schemes, and variations in logistical and resource capacities. A wide range of scientific literature presents a challenge to surgeons looking for the "best" treatment approaches, most of which is hard to understand and apply to one's own practice setting. As mentioned, there are wide variations in hernia repair methods based on the environment. In low-resource conditions, mesh usage likely ranges from 0 to 5%, whereas in high-resource ones, it reaches 95% [3,6].

Recent research documented problems with synthetic prostheses, like discomfort, stiffness of the abdominal wall, local responses (meshoma or plugoma tumors), and foreign body sensation. As a result, these impact the patient's daily functioning [7-9].

The most common method at the moment is open mesh repair, primarily Lichtenstein repair. Specialized hospitals and hernia surgeons advocate non-mesh repair, particularly for patients with a minimal risk of recurrence. Numerous lawsuits have been filed against meshes used in gynecological procedures, and the public and media have legitimately raised concerns about their safety when it comes to inguinal hernia surgery. Concerns exist over the industry's and insurance companies' influence. Some patients object to wearing mesh [3,10].

Since its description in 2001, the Desarda technique—a non-mesh method that repairs the posterior wall of the inguinal canal by using an external oblique aponeurosis—has grown in popularity because of its affordability and efficacy [11,12].
The study aimed to compare Desarda repair for primary inguinal hernia with the Lichtenstein repair.

PATIENTS AND METHODS

Study design

The current retrospective study included 158 adult male patients out of 196 patients with 1ry inguinal hernias who underwent either Lichtenstein mesh repair (L) or Desarda tissue-based repair (D).

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The final inclusion criterion includes the assessment of the condition of the external oblique aponeurosis,

The study was carried out at the Department of General Surgery Faculty of Medicine, Benha University Hospital, and Benha Teaching Hospital from January 2016 until December 2024. Follow-up is designed for 5 years duration.

Preoperative exclusion criteria included recurrent or strangulated hernias. Patients with mental disorders, and patients who were assessed on the American Society of Anesthesiologists (ASA) scale >3 score >3 were also excluded.

Intraoperative exclusion criteria include patients with ill-developed, divided, tiny, or weak external oblique aponeurosis.

Procedure:

After doing routine preoperative workup, all patients were given sedative premedication and one shot of antimicrobial prophylaxis before surgery). All operations were carried out under spinal anesthesia. Before performing any type of repair, the following mandatory steps were done including mobilization of the cord structures and identification and herniotomy

A. Lichtenstein tension-free mesh repair (L Group) (Figure 1)

According to Amid's instructions [13] the repair was carried out by applying the mesh, the floor and internal ring were strengthened. A 6 x 11 cm polypropylene foot-shaped mesh was cut to suit the inguinal floor. To make room for the spermatic cord, the mesh was divided. When implanted in the field, the mesh prosthesis was able to be sized appropriately and sufficiently cover the posterior wall of the inguinal canal. After that, the mesh was adjusted to fit the inside ring of the cord. A continuous 2/0 suture was used to fix the mesh to the inguinal ligament (IL), and a nonabsorbable 2/0 suture was used to fix it cranially.

B. The Desarda repair (D Group) (Figure 2)

Desarda repair was done using polypropylene sutures, the external oblique aponeurosis (EOA) was sutured to the reflection of the (IL) from the pubic tubercle to 2 cm behind the cord. The EOA was then incised 2.5–3 cm above the 1st suture line, leaving a flap of EOA in the inguinal canal floor where its upper border was sutured to the conjoint tendon [14]. Care was taken to locate and protect the inguinal nerves; if this was not feasible, the nerves were removed.

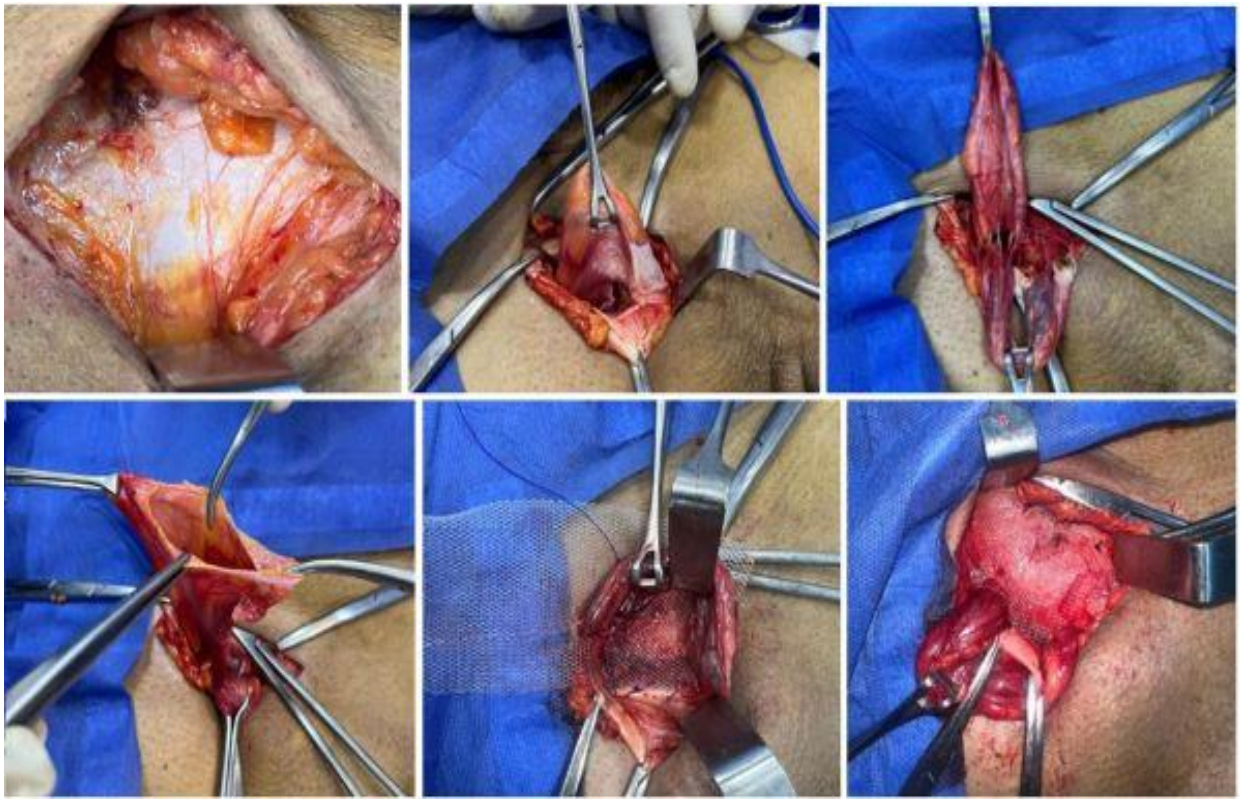

Figure 1: Lichtenstein technique

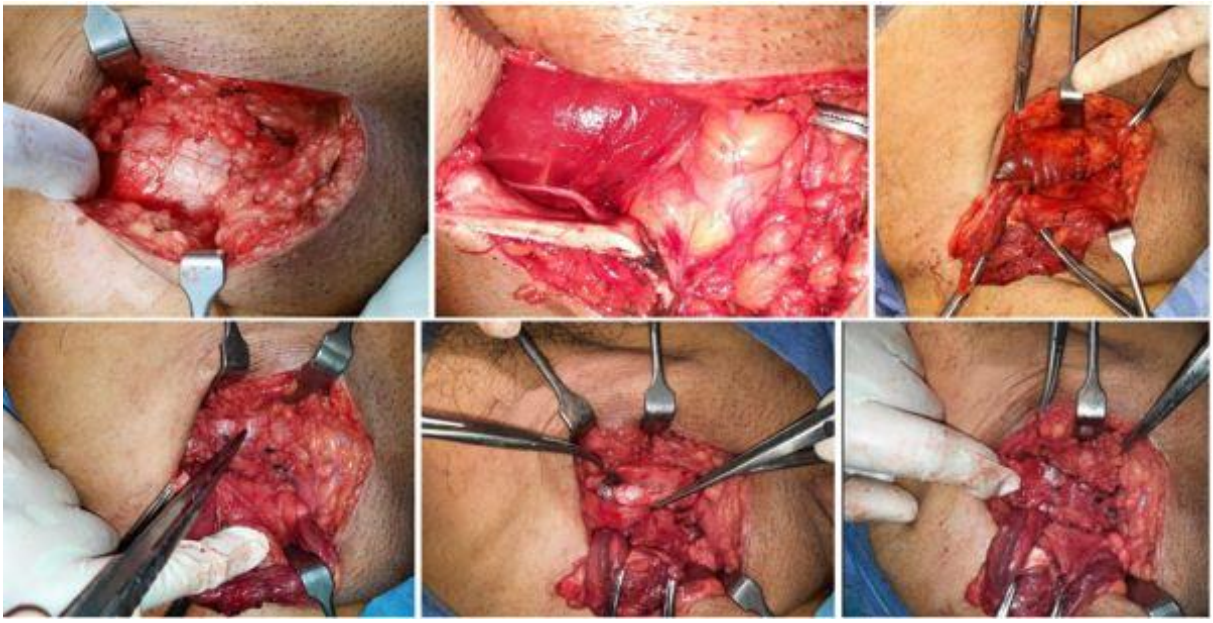

Figure 2: Desarda Repair.

Follow-up

All intraoperative variables were recorded and compared. Recurrences and other complications were recorded.

visual analog scale (VAS) was used for the assessment of early postoperative pain ranging from 0 (no pain) to 100 (maximum, unbearable pain).

Return to normal activity

- Basic activity: (i.e., dressing, walking, bathing)
- Home activity: (i.e., preparing food, cleaning house)
- Work activity: regaining all previous activities.

Outcomes

The 1^{ry} outcome was effective repair with minimal complications and low recurrence.

2^{ry} was early regaining of normal daily activities.

Statistical analysis

With an incidence of 20% loss in follow-up were taken into account while calculating the sample size, 79 samples were taken into consideration in each group with an effect size of 0.7, a power of 80%, a P value of 0.05, and G-power 3.1 software (Universities, Dusseldorf, Germany).

For the statistical study, IBM Corp., Armonk, New York, USA, provided SPSS, version 25. When describing quantitative parameters with mean and SD, the student's t-test was employed. For qualitative indicators that were expressed as the frequency with percent, the χ^2-test was employed. P-values below 0.05 were regarded as significant.

Ethical Approval: This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Benha University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

RESULTS

The study included 79 patients in each group. The mean age was 39.8±10.1 in L group while it was 41.3±9.7 in D group. Sociodemographics, comorbidities, occupation, and hernia characteristics were comparable in the two groups with no significant differences **(Table 1).**

Table 1: Sociodemographic data and patient characteristics

Variable		Group A Lichtenstein Repair C	Group B Desarda repair N=79	P value
Age		**39.8±10.1**	41.3±9.7	**0.087**
Comorbidities				
HTN		**7 (8.8%)**	8 (10.1%)	**0.79**
DM		9 (11.4%)	10 (12.6%)	**0.81**
IHD		**4 (5.1%)**	**4 (5.1%)**	**1.00**
Smoking		**37 (46.8)**	35 (44.3%)	0.75
BMI kg/m^2		**28.2±4.3**	29.1±3.8	**0.17**
Employment				
Student		**6 (7.6%)**	**5 (6.3 %)**	**0.75**
Non-physical		**36 (45.6%)**	35 (44.3%)	**0.87**
Light physical		**22 (27.8%)**	**25 (31.7%)**	**0.61**
Heavy physical		**4 (5.1%)**	**4 (5.1%)**	**1.00**
Retired		**11 (13.9%)**	10 (12.6%)	**0.81**

BMI: Body Mass Index

Table 2 shows no significant difference between the 2 study arms as regards inguinal hematoma and ecchymosis and surgical site infection (SSI) although the incidence was higher in L group but didn't reach the significance level. Seroma and testicular edema, were statistically lower in patients who underwent Desarda repair.

Table 2: Early postoperative complications at 7 and 30 days

Variable			7 days	30 days	P value
Testicular edema	**N (%)**	Group A (N=79) Group B (N=79) P value	**11 (13.9%)** **6 (7.6%)** 0.02	**6 (7.6%)** 2 (2.5%) 0.15	0.20 0.15
Inguinal hematoma	**N (%)**	Group A (N=79) Group B (N=79) P value	3 (3.8%) 3 (3.8%) 1.00	0(0%) 0(0%) 1.00	0.08 0.08
Ecchymosis	**N (%)**	Group A (N=79) Group B (N=79) P value	5(6.3%) **4 (5.1%)** 0.73	1(1.3%) 1(1.3%) 1.00	< 0.10 < 0.17
Seroma	**N (%)**	Group A (N=79) Group B (N=79) P value	9 (11.4%) 5(6.3%) < 0.26	2 (2.5%) 0 (0%) < 0.15	< 0.03* < 0.02*
Surgical site infection	**N (%)**	Group A (N=79) Group B (N=79) P value	3 (3.8%) 2 (2.5%) 0.65	0 (0%) 0 (0%) 1.00	< 0.08 < 0.15

*: Significant.

There was no significant difference between the D and L groups in regard to pain reported via the VAS score (mean 7.95±1.3 vs.7.6 ± 1.1, respectively; $p = 0.07$). After the VAS results were transformed to a descriptive pain scale, no differences were noted there either. Patients from the L and D groups reported mild pain (VAS 1–29): 82.3% of patients and 84.8 %respectively ($p = 0.32$). Return to basic, home, and work activities was achieved after comparable times in the two groups. Although the return-to-work activity occurred later in the L group, the difference was not significant at any of the time points **(Table 3).**

Table 3: VAS score and return to normal activities of the included patients

Variables		Group A Lichtenstein Repair N=79	Group B Desarda repair N=79	P value
Return to Activities				
Return to basic activity	**Mean± SD (days)** **Range (days)**	1.3±0.3 2-6	1.2±0.3 1-5	0.06
Return to home activity	**Mean± SD (days)** **Range (days)**	6.9±3.3 5-17	6.3±3.4 5-13	0.41
Return to work activity	**Mean± SD (days)** **Range (days)**	21.3±5.8 16-5	20.2±6.3 14-31	0.29
VAS	**Mean± SD**	7.95±1.3	7.6 ± 1.1	0.07
Mild pain VAS (1-29) **Moderate VAS (30-55)** **Strong VAS >55**	**N (%)** **N (%)** **N (%)**	65 (82.3%) 14 (17.7%) 0(0%)	67 (84.8%) 12 (15.2%) (0%)	0.67 0.67 -

*: Significant

For long-term follow-up, no significant difference between both study limbs as regards recurrence was found although loss or change in sensation, abdominal wall stiffness and F.B sensation were more evident in L Group (**Table 4).**

Table 4: Long term follow up at 1, 3, and 5 years

			1 year	3 years	5 years	P value
Recurrence	**N (%)**	Group A Group B P value	0 (0%) 0 (0%) -	1(1.3%) 1(1.3%) 1.00	1(1.3%) 1(1.3%) 1.00	0.60 0.60
Loss or change in sensation	**N (%)**	Group A Group B P value	**16 (20.4%)** **12 (15.3%)** 0.40	8 (10.2%) **4 (5.1%)** 0.23	3 (3.8%) 1(1.3%) 0.31	<0.005* <0.002*
Abdominal wall stiffness	**N (%)**	Group A Group B P value	**22 (27.8%)** **14(17.6%)** <0.001*	**12(15.3%)** 5 (6.3 %) <0.001*	**6 (7.6%)** **1(1.3%)** <0.001*	<0.003* <0.001*
Foreign Body (F.B) sensation	**N (%)**	Group A Group B P value	9 (11.4%) **4 (5.1%)** <0.15	**4 (5.1%)** 1(1.3%) <0.17	2 (2.5%) 0 (0 %) <0.15	<0.06 <0.07

*: Significant.

DISCUSSION

One of the most frequent surgical presentations in the world is an inguinal hernia [9]. A mesh-based approach was suggested as the primary option for all groin hernias in the Hernia Surge guidelines. The potential negative consequences of Mesh have drawn attention and public concern worldwide with the release of the International Hernia Surge Guidelines [15].

It is crucial to restate that mesh prostheses are safe and beneficial, as evidenced by the literature. When recommending treatment choices to patients, the following mesh repair complications—whether brought on by surgical or prosthetic technique—should be taken into account. Chronic post-inguinal hernia repair pain is often caused by the shrinkage, migration, or erosion of meshes into neighboring structures [16-19]. Although some studies have shown that mesh inguinal hernia repair improves sexual function and fertility, dysejaculation and pain related to sexual activity have been described as complications of the procedure [18,20].

The seroma was one of the main drawbacks of mesh-based repair for inguinal hernia. In the present study, seroma was more significant in L group and this is matched **Manyilirah *et al*.**[21] and many other previous studies [22-27] that reported the same outcomes.

Following irritation and serum leakage, the implantation of prosthetic materials may be a contributing factor in the development of seromas [28].

Five RCTs [21-25] with a total of 2777 participants reported more postoperative hematoma development in the L group and this comes against the current findings where no reported significant difference was found between the Desarda and Lichtenstein technique groups.

In the current study, the surgical site infection was higher in Lichtenstein group than Desarda group matching the results of many previous studies [21-25] and this may be due to the use of prosthetic material as well as the more reported incidence of seroma in patients in Group A. These issues are thought to be related to the

presence of a FB (mesh), which is removed during DT [29,30]

No significant difference was reported as regards the time to return to daily and work activity between both groups matching the results of previous studies [22-26]. The time it takes to return to work may not be a significant metric for comparing recovery from different surgical methods because it has been proposed that it depends on a number of non-medical factors, including patient expectations, mental state, and occupation [31].

With a follow-up of up to five years after surgery, a meta-analysis and network analysis of all available RCTs on inguinal hernia repair revealed no differences in the presence or intensity of chronic pain between tissue-based, Lichtenstein, and laparoscopic procedures [31,32] in the present study, Loss or change in sensation, Abdominal wall stiffness and F.B sensation were more evident in L Group.

Desarda and Lichtenstein both offer a low recurrence rate [33]. In the present study, no significant difference was reported as regards the recurrence rate in both groups over 5 years of follow-up matching the results of **Mohamed *et al.*** [9] who included five randomized controlled trials [22-25,34] in their systemic review reporting no significant difference in the recurrence rate between patients underwent Desarda and Lichtenstein repair (0.655% and 0.9% respectively). This incidence was slightly higher than the current results although only one recurrence was reported in each group and this may be assumed to be due to the small number of the included patients in comparison with the 2806 patients included in **Mohamed *et al.*** [9] systemic review.

CONCLUSION

In terms of recurrence, hematoma, and interval to resume regular daily activities or jobs, the outcomes of the Desarda and Lichtenstein procedures were shown to be similar. Furthermore, Desarda outperformed Lichtenstein in lowering problems such seroma development and SSI that were linked to presence of the mesh.

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- **Funding:** NIL.

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