

A Randomized Controlled Trail of Desarda's Repair with Lichtenstein Repair in the Management of Inguinal Hernia

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Abstract: ***Aim:** We analyze the outcomes of the Desarda tissue - based repair in comparison with the standard Lichtenstein procedure in treatment of primary inguinal hernia. **Objectives:** To compare the short - term results of Desarda technique with Lichtenstein's technique in terms of operative time, postoperative pain, seroma formation, surgical site infection, time to resume physical activity, foreign body sensation in the groin and recurrence. **Methods:** A total of 62 patients were randomly allocated into two groups to undergo one of two repairs: Desarda (group I) or Lichtenstein (group II) (30 vs.32, respectively). The outcome measures were operative time, postoperative pain was assessed on day 1, 3, 5, 30 and 90 using Visual analogue scale, seroma formation, surgical site infection, time to resume physical activity, foreign body sensation in the groin and recurrence. 3 patients didn't complete the follow - up and were excluded from analysis. Finally, 30 hernias were analyzed in the Lichtenstein group and 29 in the Desarda group. **Results:** After a 3 - month follow - up period, a single recurrence was observed in the Lichtenstein group, while no recurrences were reported in the Desarda group. The average operative time was 74.4 ± 2.5 minutes for the Lichtenstein repair and 71.9 ± 1.8 minutes for the Desarda repair ($P = 0.054$). In the Desarda group, postoperative pain was significantly lower during the first 5 postoperative days ($P < 0.0001$), as well as on postoperative day 90 ($P = 0.004$), compared to the Lichtenstein group. The Desarda group also demonstrated a significantly shorter time to resume physical activity ($P < 0.0001$) compared to the Lichtenstein group. There were statistical differences in postoperative pain and time to resume physical activity between the Desarda and Lichtenstein groups. **Conclusion:** The results of inguinal hernia treatment using the Desarda technique are comparable to those of Lichtenstein mesh repair. The key advantage of the Desarda technique is that it does not require the use of mesh, making it cost - effective. Additionally, the Desarda technique is easy to learn and patients who undergo this procedure experience earlier ambulation and less post - operative pain compared to those who undergo standard Lichtenstein mesh repair.*

Highlights

- Desarda introduced a mesh - free method for inguinal hernia repair in 2001.
- This study compared postoperative complications between Desarda repair and Lichtenstein repair.
- The Desarda group experienced significantly less postoperative pain ($P < 0.0001$).
- Patients in the Desarda group resumed physical activity significantly sooner ($P < 0.001$).
- Over a 3 - month follow - up, one recurrence occurred in the Lichtenstein group, while there were no recurrences in the Desarda group ($P = 0.999$).

1. Introduction

The term "hernia" is derived from Latin and means "a rupture" [1]. An inguinal hernia occurs when the contents of the abdominal cavity or preperitoneal fat protrude through a hernia defect in the inguinal area [2]. The exact incidence and prevalence of inguinal hernia are not well - defined. However, the likelihood of undergoing inguinal hernia surgery during one's lifetime is relatively high, estimated at 27% in men and 3% in women [3 - 5].

Inguinal hernia is one of the most common surgical conditions that can be treated effectively. Currently, the Lichtenstein method is the most widely used open mesh repair technique, which has shown recurrence rates of approximately 4% in long - term follow - up [6, 7]. However, this method has certain drawbacks. The use of

mesh implantation in the Lichtenstein method can lead to issues such as chronic groin pain, foreign body sensations, abdominal wall stiffness, and surgical site infections, all of which can interfere with the patient's daily activities [8, 9]. Furthermore, complications like mesh migration, mesh rejection, and sexual dysfunction causing pain and impairment of sexual activity have also been reported following mesh - based hernia repair techniques [10 - 13].

The success of hernia surgery is typically evaluated based on several benchmarks, including the recurrence rate, complication rate, simplicity of the procedure for surgeons in training, cost - effectiveness, and the time required for patients to return to normal activities [14].

In 2001, Desarda introduced a new method that appears to meet the aforementioned criteria. This technique does not involve the use of prosthetic mesh, complicated dissection or suturing, or the weakening of muscles or transversalis fascia for repair. Notably, the Desarda method is straightforward to learn.

According to the author, the Desarda method yields results that are either superior to or on par with the outcomes of Shouldice and Lichtenstein repairs. The reported complication rate is 1.8%, with a recurrence rate as low as 0.2% [15, 16].

2. Materials and Methods

- **Sample:** 62
- **Study Design:** Prospective study
- **Study Period:** June 2021 to June 2022

Inclusion Criteria:

Patients with inguinal or inguinoscrotal hernia.

Exclusion Criteria:

Patients below the age of 18 years, all complicated inguinal hernia, (Obstructed, strangulated, and gangrenous hernia), recurrent inguinal hernia, Patients with infection in the inguinal region or epididymo - orchitis, patients found to have thin, weak or divided external oblique aponeurosis intraoperatively.

Patients with a visible inguinal or inguinoscrotal swelling, presence of cough impulse, inability to get above the swelling, dull aching pain in inguinal region were diagnosed as inguinal hernia. All patients were subjected to preoperative evaluation including history taking, clinical examination and basic laboratory investigations. Elderly patients were subjected to further investigations as part of pre - anaesthetic work up and looked for any complications.

Patients were randomly divided into 2 groups by a team of surgeons to undergo one of the two repairs by Odd number patients were underwent Desarda tissue based repair (A group) and even number patients were underwent Lichtenstein mesh based repair (B group). In this study assignment of patient to surgery was done by randomization. Anaesthesia was used according to the anaesthetist's opinion after detailed pre anaesthetic evaluation. Oblique inguinal skin crease incision was used in all procedures. Dissection and assessment of the external oblique aponeurosis (EOA) was done. Operating time was calculated from skin incision to skin closure.

1) Desarda tissue based repair [A group]:

The Desarda repair for inguinal hernia was done as per the original description. The external oblique aponeurosis (EOA) was opened, hernia sac identified and either reduction inversion of the direct sac or herniotomy of the indirect sac was done. Upper leaf of EOA sutured to inguinal ligament in interrupted manner. A splitting incision was taken in upper leaf of EOA. The upper free border of EOA strip was sutured interruptedly to internal oblique or conjoint muscles with Prolene 2/0.

The resultant strip of EOA placed behind the cord formed a new posterior wall of inguinal canal. The spermatic cord placed in the inguinal canal and the lateral leaf of EOA is sutured to the newly formed medial leaf of EOA in front of the cord using Prolene 2/0 interrupted sutures. The superficial fascia and skin were closed as usual.

2) Lichtenstein mesh based repair [B group]:

The Lichtenstein tension free mesh repair was done as described by Lichtenstein. A polypropylene mesh was tailored to fit the posterior wall of inguinal canal. The mesh was sutured to the pubic bone, the inguinal ligament and internal oblique with Prolene 2/0. A 2 cm slit was made in the mesh to accommodate the cord, the two tails of which sutured together to create a new deep ring. The spermatic cord placed in the inguinal canal, closed by suturing the two edges of EOA. The superficial fascia and skin were closed as usual.

Postoperative analgesia was same for both the groups. Routine administration of one dose of tramadol injection was given postoperatively to each patient. Tablet Paracetamol was given to all patients twice a day for 3 days. The outcome factors are early recurrence of inguinal hernia, operative time measured from skin incision to skin closure, Postoperative pain scores was assessed on day 1, 3, 5, 30 and 90 using Visual analogue scale; 0 as least pain and 10 as maximum pain. Visual analogue scale score >5 at end of 3 months was the criteria to label as chronic pain. Time taken to return to basic and home activities was described as the patient's ability to perform basic elementary activities (i. e. getting dressed, walking) and home activities like (bathing, and performing daily household chores), seroma formation, surgical site infections, foreign body sensation were evaluated as postoperative complications. Patients were called up for follow up 1 month, end of 3rd month after the operation to note the complications and recurrence of hernia.

3. Statistical Analysis

Data were entered in the excel spread sheet and variables were coded accordingly. The statistical analyses were performed using SPSS version 20 trial software. Data were presented as mean with Standard deviation for normal distribution/scale data. Data were presented as frequency with proportion n (%) for categorical data. Unpaired 't' test was used to compare the means between the two groups. Fisher's exact test was used to compare the proportions between the two groups. p<0.05 was considered statistically significant.

Table 1: Comparison of baseline characteristics of two groups (Lichtenstein Vs Desarda)

S. No	Parameter	Lichtenstein group (n=32)	Desarda group (n=28)	Test	Statistic value	df	P value
1	Age in years (mean ±SD)	44.8 ± 6.3	45.1 ± 7.3	Unpaired 't' test	t=0.112	58	0.911 (NS)
2	Gender (n, %)			Fisher's exact test	$\chi^2=0.533$	1	0.657 (NS)
	Male	30 (93.8)	25 (89.3)				
	Female	2 (6.2)	3 (10.7)				
3	Types of Hernia			Fisher's exact test	$\chi^2=0.021$	1	0.999 (NS)
	Direct	5 (15.6)	4 (14.3)				
	Indirect	27 (84.4)	24 (85.7)				

NS = Not significant.

Table 2: Age distribution of patients observed between two groups (Lichtenstein Vs Desarda).

S. No	Age group	Lichtenstein group (n=32)	Desarda group (n=28)	Test	Statistic value	df	P value
1	31 – 40	8 (25)	8 (28.6)	Fisher's exact test	0.097	1	0.778 (NS)
2	41 – 50	18 (56.2)	14 (50)		0.234	1	0.628 (NS)
3	51 – 60	6 (18.8)	6 (21.4)		0.067	1	0.795 (NS)

Data are expressed as n (%). NS = Not significant

Table 3: Comparison of intraoperative and postoperative variables between two groups (Lichtenstein Vs Desarda)

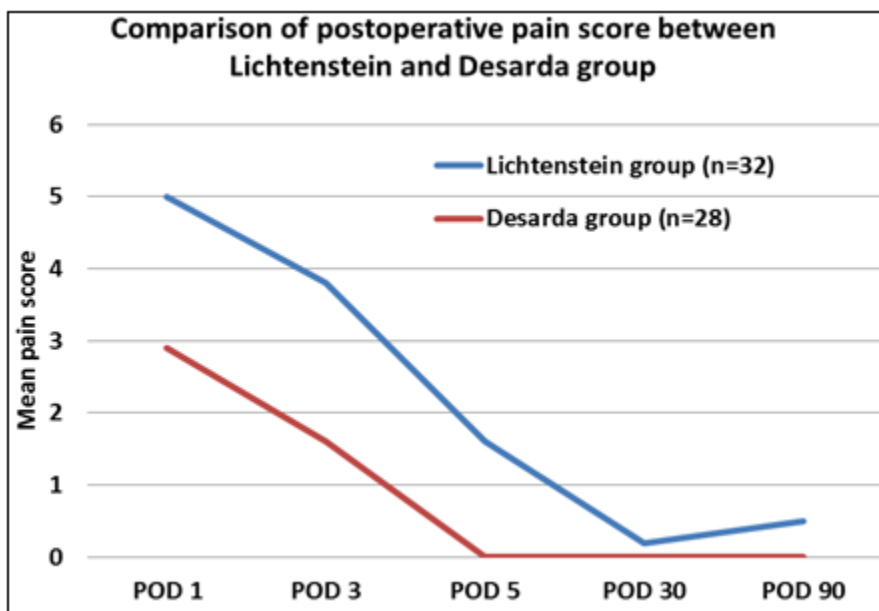
S. No	Parameter	Lichtenstein group (n=32)	Desarda group (n=28)	Test	Statistic value	df	P value
1	Duration of surgery (min)	74.4 ± 2.5	71.9 ± 1.8	Unpaired 't' test	t=1.96		0.054 (NS)
Post - operative pain score							
2	POD 1	5 ± 1	2.9 ± 1	Unpaired 't' test	t=7.88	58	<0.0001*
3	POD 3	3.8 ± 0.6	1.6 ± 0.8		t=11.2	58	<0.0001*
4	POD 5	1.6 ± 0.8	0 ± 0		t=10.8	58	<0.0001*
5	POD 30	0.2 ± 0.6	0 ± 0		t=1.96	58	0.044*
6	POD 90	0.5 0 ± 0.8	0 ± 0		t=3.01	58	0.004*
7	Time taken to return to normal gait (days)	5.5 ± 0.7	3.1 ± 0.6		t=13.8	58	<0.0001*

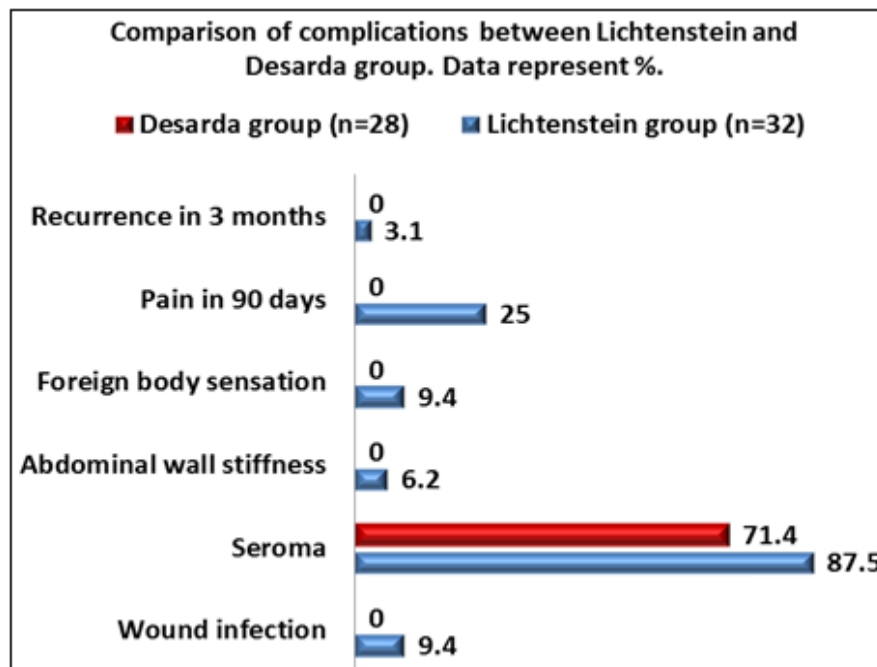
Data are expressed as mean with SD. *indicates p<0.05 and considered statistically significant

Table 4: Comparison of postoperative complication between the two groups (Lichtenstein Vs Desarda)

S. No	Parameter	Lichtenstein group (n=32)	Desarda group (n=28)	Test	Statistic value	df	P value
Early complications							
1	Wound infection	3 (9.4)	0 (0)	Fisher's exact test	$\chi^2=2.6$	1	0.241 (NS)
2	Seroma	28 (87.5)	20 (71.4)		$\chi^2=2.411$	1	0.195 (NS)
3	Abdominal wall stiffness	2 (6.2)	0 (0)		$\chi^2=1.81$	1	0.494 (NS)
Late complications							
1	Foreign body sensation	3 (9.4)	0 (0)	Fisher's exact test	$\chi^2=2.76$	1	0.241 (NS)
2	Pain in 90 days	8 (25)	0 (0)		$\chi^2=8.01$	1	0.0045*
3	Recurrence in 3 months	1 (3.1)	0 (0)		$\chi^2=0.89$	1	0.999 (NS)

Data are expressed as n (%). *indicates p<0.05 and considered statistically significant. NS = Not significant





Graph 1: Showing Postoperative Pain Score

4. Results

In total, 62 cases of inguinal hernia operated during the study duration. 32 in Lichtenstein and 30 in Desarda group. The baseline characteristics of two groups and Age distribution of patients compared with no statistical differences shown in Tables 1 and 2. The intraoperative and postoperative variables are shown in Table 4.

All Patients after Desarda's operative procedure get **EARLY RECOVERY** as compared to the standard Lichtenstein mesh repair. The mean duration (in days) to return to normal gait on statistical calculation was statistically significant with P value < 0.0001.

There was a statistically significant difference in post-operative pain scores with P value < 0.0001. On looking at the Graph 1, it is clearly observed that the pain scores in Desarda group are significantly less than Lichtenstein group. On comparison & evaluation of complications observed post operatively all the P Values are >0.05 which is statistically not significant, implying that both Lichtenstein and Desarda have comparable complication rates. There was no significant difference regard to operative time, seroma formation, surgical site infection, foreign body sensation in the groin.

There was one recurrence in Lichtenstein arm during the 3 month follow up. In Lichtenstein group the recurrence was near the pubic tubercle due to mesh rejection.

5. Discussion

Surgical repair of the inguinal hernia is the most common general surgery procedure performed today [19]. The successful surgical repair of inguinal hernia depends on a tension free closure of hernia defect to attain the lowest possible recurrence rate [1]. Use of prosthetic material for inducing fibrosis thereby strengthening the posterior wall of

inguinal canal was principle Behind lichtenstein mesh repair technique. It achieves most of the requirements of an ideal hernia surgery, but the complications related to the mesh are described [10, 11]. Many newer prosthetic Materials (biomaterials) have come to light, but their use in treatment of inguinal hernia is still a question.

Thus the search for ideal operative technique for inguinal hernia With low costs, low complication and recurrence rates, operability By consultants, surgeons in training at smaller and district hospitals, Ease of learning and enabling early return to day to day activities. The **desarda technique** satisfies most of the criteria of a Ideal technique.

Desarda uses external oblique aponeurosis for strengthening the posterior wall of inguinal canal. The author claims results, which are superior or equal to lichtenstein repairs, With 1.8% complication rate and 0.2% recurrence. The present study compared desarda technique with standard Lichtenstein technique for clinical outcomes, postoperative pain, Complications and early recurrence in treatment of primary Inguinal hernia.

In this study, Postoperative pain was significantly less in Desarda group (P = 0.0001) compared to Lichtenstein group.

Time taken to return to basic activities was statistically significant (P = 0.0001) suggesting patients operated with Desarda technique get ambulatory sooner and return to the basic activities before the patients operated with Lichtenstein repair. Early return to home activity in Desarda technique may be attributed to less tissue handling, less dissections and less postoperative pain.

One patient in lichtenstein group had recurrence and in the desarda group there was no recurrence within 3 month of operative repair (P=0.999). In lichtenstein group the recurrence was near the pubic Tubercle.

The duration of operation is a surgeon dependent variable and reflects the ease of operation. In the present study, operating time was calculated from skin incision to skin closure. The mean operative time was 74.4 ± 2.5 mins for Lichtenstein and 71.9 ± 1.8 mins for Desarda repair. ($P = 0.054$). It was statistically not significant. The similar operating time required is attributed to the fact that time required to fix the mesh is similar to the time required to cut and fix the external oblique aponeurosis in Desarda repair.

With respect to post - operative complications, there is no statistically significant difference between the two study arms.

- We believe pure tissue based hernia repair method like Desarda must be considered among the mainstream treatment guidelines for inguinal hernia. The strip of EOA is an excellent alternative to mesh. The strip being physiological, natural, and universally available prosthesis for reinforcing posterior wall of inguinal canal.
- We think exact identification of patients who are appropriate for tissue based repairs is necessary. The most evident indications for use of the Desarda technique include use in young patients, strangulated inguinal hernias, and financial constraints and when patient disagrees with the use of mesh. Use of originally unhealthy tissue for repair may lead to recurrence.
- The present study is a randomized controlled study where allocation of patients to the 2 groups was done by randomization. Exclusion criteria had Patients < age of 18 years, all complicated inguinal hernia (Obstructed, strangulated, and gangrenous hernia), recurrent inguinal hernia, patients found to have thin, weak or divided external oblique aponeurosis intraoperatively. Similar exclusions were also followed for Lichtenstein (B group) and the complicated patients were completely excluded.

6. Conclusion

- After a 3 - month follow - up period it was found that **no significant difference** in between desarda & Lichtenstein repair in management of inguinal hernia except post - operative pain & time taken to return to normal gait.
- The results of inguinal hernia treatment with the Desardatechniqueas good as Lichtenstein mesh repair in terms of in Desarda technique does not use a mesh, this makes **cost effective, easy to learn** and Patients after Desarda's operative procedure get **ambulatory sooner and less post - operative pain** as compared to the standard Lichtenstein mesh repair.

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