When and why Desarda repair: Evaluation of the efficacy of Desarda technique in the management of inguinal hernia

Original Article

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ABSTRACT

Background: Inguinal hernia is a highly important topic in the field of abdominal wall surgery. The management is highly regulated.

Aim & objectives: The primary objective of this study was to evaluate the efficacy of the Desarda approach, operative technique, postoperative outcomes, complications, and side effects avoided when using mesh repair.

Patients and Methods: This observational prospective study was undertaken at Assiut University Hospital. This study was conducted on a sample of 30 male patients who had unilateral oblique inguinal hernia and were receiving either Desarda or Lichtenstein treatment.

Results: Both groups exhibited a statistically significant enhancement in the average visual analog scale for pain at 14 days postoperatively (repeated measures analysis of variance, *P=001*). There was an insignificant difference detected between the groups, based on statistical analysis as regards visual analog scale for pain at 3 h, and 1, 2, 7, and 14 days postoperatively (independent sample t test, *P>0.05*).

Conclusion: In terms of recurrence rates, acute postoperative discomfort, and overall results, Desarda's tissue repair was comparable to Lichtenstein's mesh repair, chronic groin discomfort, infection of the wound, and the duration of recovery to resume normal daily activities. We conclude that the Desarda repair is equally efficient as the usual Lichtenstein surgery in achieving effective hernia repair with no use of mesh with regards to pain.

Key Words: Desarda technique, inguinal hernia, mesh repair.

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INTRODUCTION

Inguinal hernia is a highly important topic in the field of abdominal wall surgery. The management is highly structured. The main parameters used to evaluate the efficacy of hernia surgery are not only the frequency of complications (namely, pain in the groin area and recurrence) but also the expense and recovery time[1].

The Desarda approach is a mesh-free surgical technique that was initially described in 2001. This surgical procedure employs a section of the external oblique aponeurosis as a substitute for a mesh. Its unique characteristic is in its affordability, absence of mesh utilization, and reduced need for thorough dissection[2].

Mesh repair has inherent restrictions due to its unphysiological use of mesh. Common problems in strangulated hernias consist of the possibility of mesh infection, persistent inguinal discomfort, seroma production, and foreign body feeling. Additionally, the use of mesh in these cases may result in increased costs.

This study shows the experience in using the Desarda technique in inguinal hernia repair. Assess the effectiveness of the Desarda technique, as regarding postoperative pain and recurrence, it also shows the side effects avoided when using mesh repair.

PATIENTS AND METHODS:

This research was performed at the Department of General Surgery, Assuit University. Ethical Committee approval and written, informed consent were obtained from all patients.

Inclusion criteria

Primary inguinal hernia, reducible inguinal or inguino-scrotal hernia, and age greater than 18.

Exclusion criteria

Groin region infection, bilateral hernia, recurrent hernia, incarcerated hernia, obstructive uropathy, and pantaloon hernia.

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Sample size calculation

As there was no previous study published data about the same issue, we did a pilot study with at least N=30 then we calculated the minimum±SD and then we calculated the sample size from our pilot result.

The sample size was 30 : 15 cases that underwent Desarda technique repair. Fifteen cases underwent mesh repair.

Study tools

A clinical trial was carried out on thirty individuals who had been diagnosed with as oblique inguinal hernia. The study group had hernia repair using the Desarda procedure.

All patients were subjected to:

Full history taking including age, name, sex, occupation, physical effort, workout, diabetes mellitus, hypertension, and any medical condition the patient had. History of recurrent inguinal hernia, and previous operations.

Examination

General and local examination

Examination of vital signs such as blood pressure, heart rate, and temperature.

Laboratory investigations

Complete blood count, kidney functions, liver functions, and blood sugar.

Follow-up

Every patient was discharged on the first day after the operation. The dressing was replaced on the fourth day after the operation, and the stitches were removed on the eighth day after the operation. The patients were thereafter instructed to return for follow-up visits at intervals of 1, 3, 6, 12, and 24 months. During these subsequent visits, the presence of problems such as bruising, swelling of the scrotum, fluid accumulation, infection at the surgical site, long-lasting pain, and reappearance of the condition were seen.

Mesh repair

Following the administration of the proper anesthetic, a straight incision measuring 5–6 cm in length was made parallel to the inguinal ligament, directly above the intended area of the external ring (Fig. 1).

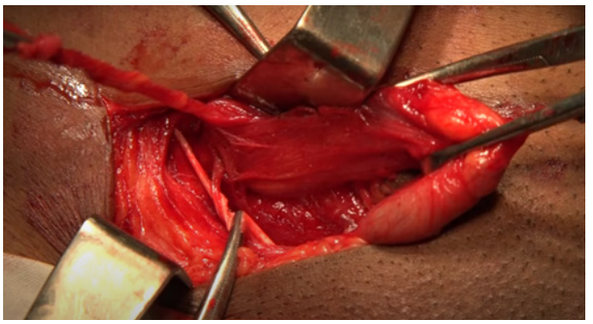

Fig. 1: Hernia sac dissection.

The Lichtenstein tension-free hernioplasty was a process for fixing hernias. There are many different kinds of meshes, and depending on the product, each mesh has a different approach. The basic concept was to reinforce and restore the inguinal floor by using a mesh to cover the fascial defect, hence preventing further hernias after the repair process. The surgeon may choose to reapproximate the external oblique fascia and recreate the external ring (Fig. 2).

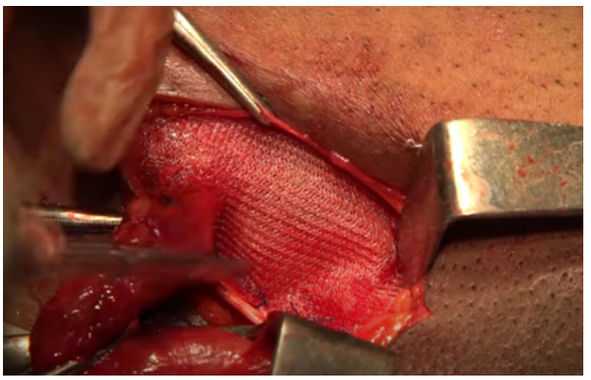

Fig. 2: Mesh fixation in Lichtenstein repair.

Desarda repair

Is based on the concept of providing a strong, mobile and physiologically dynamic posterior inguinal wall. The technique is simple, as well as being easy to learn and perform.

The fascial plasty starts with the medial leaf of the EOA, which is sutured with the inguinal ligament from the pubic tubercle to the abdominal ring. The first two sutures were taken through the anterior rectus sheath, and the last suture was taken to narrow the abdominal ring sufficiently, caring not to strangulate the spermatic cord.

An incision is made on the sutured medial leaf to obtain an aponeurosis flap of 1–2 cm. This fascial flap is extended medially up to the pubic symphysis and 2 cm beyond the abdominal ring laterally.

The upper free border of the aponeurosis flap is sutured to the internal oblique muscle at the level of the conjoint

tendon with a continuous suture. With these sutures of the EOA, a new posterior wall of the inguinal canal is formed behind the spermatic cord.

After the suture of the EOA, the patient is asked to cough or strain if it is under locoregional anesthesia, and general anesthesia the anesthetist is asked to give a deep breath to the patient; this is to verify the solidity of the new posterior wall.

The spermatic cord is replaced in the inguinal canal; the lateral leaf of the EOA is sutured to the new medial leaf of the EOA with a number 2/0 monofilament polydioxanone continuous sutures (Fig. 3).

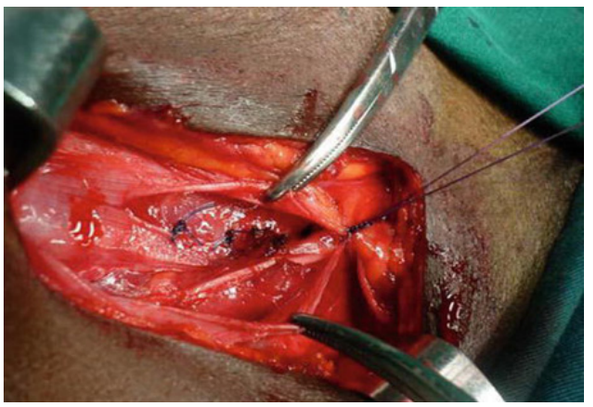

Fig. 3: Suture of the lateral leaf of the EOA to the new medial leaf of the EOA.

Outcome measures: primary (main)

Postoperative hospital stay refers to the time a patient spends in the hospital after a surgical procedure. Chronic pain is defined as either moderate [with a visual analog scale (VAS) score of 30–54] or high (with a VAS score >54) pain that persists for more than 6 months after surgery. Hernia recurrence refers to the reappearance of a hernia after it has been surgically repaired. Secondary (subsidiary): surgical duration, surgical expenses, duration required to resume different levels of daily activities, and sensation of a foreign object present. Stiffness of the abdominal wall in the groin region and postoperative complications (infection, seroma, recurrency, and stitch sinus).

Statistical analysis

The Shapiro–Wilk test was used to determine if the overall distribution of the data was regular. With SPSS, version 22.0 (IBM Corp., Armonk, New York, USA), the percentages and frequencies for the qualitative factors and the averages and SDs for the quantitative variables were calculated. While the independent sample t test was used to look at numerical data, the χ^2 test was employed to analyze categorical variables. Repeated measures analysis of variance was used to examine the results from different follow-up periods. Statistical significance was defined as a *P value* of less than 0.05.

Patient characteristics

Our study included 30 male individuals having unilateral oblique inguinal hernia who had either Desarda or Lichtenstein surgery. (Table 1) presents a comparison of the fundamental demographic information for both groups. There were no significant differences between the groups in terms of age, BMI, work status, related comorbidities, American Society of Anesthesiologists physical status, and follow-up length.

RESULTS:

Table 2 compares the hernial characters of enrolled patients. Insignificant statistical difference was detected across the groups regarding disease duration, type, laterality, side, size, and reducibility.

The mean duration of hernia was 43.8±9.5 months (range, 32–59) in the Desarda group and 45.7±7.6 months (range, 31–60) in the Lichtenstein group. All patients had unilateral indirect and reducible inguinal hernias. Ten (66.7%) patients in the Desarda group and nine (60%) patients in the Lichtenstein group had right-sided hernias. The mean hernial size was 3.2±0.8 and 3.5±0.9 cm in the Desarda and Lichtenstein groups, respectively.

Table 3 compares the surgical data, including operating time, hospital stay, and postoperative VAS for pain at different intervals.

Patients in the Desarda group had an average surgery length of 54.5±0.11 min (range, 41–65 min), whereas patients in the Lichtenstein group had an average surgery duration of 59.9±7 min (range, 45–69 min). Compared to the Lichtenstein group, the Desarda group's operation took less time to complete. However, the difference failed to reach statistical significance (*P=0.059* for the independent sample t test). Patients in the Desarda group stayed in the hospital for an average of 1.8±0.4 days (range, 1–3), whereas those in the Lichtenstein group stayed in the hospital for an average of 2±0.5 days (range, 1–3). Regarding the length of hospital stay, no statistically significant difference was found between the groups. Fourteen days after surgery, there were a statistically significant improvement in both groups' average VAS scores for pain. When comparing the groups' pain levels after 3 h, 1, 2, 7, and 14 days following the operation, the VAS revealed no discernible differences.

Table 4 compares the parameters of functional recovery, including time to return to basic activity, time to return to home activity, and time to return to work.

Regarding the amount of time needed for functional recovery, there was no statistically significant difference between the groups (independent sample t test, *P>0.05*).

Table 5 compares the intraoperative and postoperative complications, including ilioinguinal and iliohypogastric injury, testicular edema, testicular atrophy, hematoma, ecchymosis, infection, chronic pain, paresthesia, and recurrence.

Table 1: Patient characteristics (N=30 patients)

Variables	Desarda (*N*=15) [*n* (%)]	Lichtenstein (*N*=15) [*n* (%)]	*P* value
Age, years	34.1±9.8	35±11.6	0.815*
Less than 30	6 (40)	5 (33.3)	
30–40	3 (20)	4 (26.7)	
More than 40	6 (40)	6 (40)	
BMI, kg/m^2	28.4±4.8	28.2±5.7	0.910*
Average	4 (26.7)	4 (26.7)	
Overweight	7 (46.7)	6 (40)	
Obese	4 (26.7)	5 (33.3)	
Employment			0.658**
None	2 (13.3)	2 (13.3)	
Student	3 (20)	1 (6.7)	
Nonphysical	6 (40)	3 (20)	
Light physical	4 (26.7)	5 (33.3)	
Heavy physical	2 (13.3)	4 (26.7)	
Medical comorbidities	7 (46.7)	6 (40)	0.713**
Smoking	4 (26.7)	3 (20)	0.666**
ASA			0.879**
Grade I	8 (53.3)	9 (60)	
Grade II	4 (26.7)	4 (26.7)	
Grade III	3 (20)	2 (13.3)	
Follow-up, months	15±1.9	14.5±2.1	0.950*

ASA, American Society of Anesthesiologists.
*Independent sample t test.
**χ^2 test.

Table 2: Hernia characteristics (N=30 patients)

Variables	Desarda (*N*=15) [*n* (%)]	Lichtenstein (*N*=15) [*n* (%)]	*P* value
Duration, months	43.8±9.5	45.7±7.6	0.554*
Type of hernia			–
Indirect	15 (100)	15 (100)	
Direct	0	0	
Laterality			–
Unilateral	15 (100)	15 (100)	
Bilateral	0	0	
Side			0.705**
Right	10 (66.7)	9 (60)	
Left	5 (33.3)	6 (40)	
Hernial size, cm	3.2±0.8	3.5±0.9	0.402*
Reducibility			–
Reducible	15 (100)	15 (100)	
Irreducible	0	0	

*Independent sample t test.
**χ^2 test.

Table 3: Surgical outcomes (N=30 patients)

	Desarda (*N*=15)		Lichtenstein (*N*=15)		
Variables	Mean	SD	Mean	SD	*P* value*
Operating time, min	54.5	8.11	59.9	7.03	0.059
Hospital stay, days	1.8	0.4	2.0	0.5	0.545
VAS for pain					
3 h	1.2	0.78	1.4	0.74	0.475
24 h	1.7	0.70	2.2	0.78	0.095
48 h	3.7	0.88	4.0	0.93	0.426
7 days	1.3	1.22	1.5	0.99	0.517
14 days	0.5	0.52	0.7	0.49	0.285
P value**	<0.001		<0.001		

VAS, visual analog scale.
*Independent sample t test.
**Repeated measure analysis of variance.

Table 4: Functional recovery (N=30 patients)

	Desarda (*N*=15)		Lichtenstein (*N*=15)		
Variables	Mean	SD	Mean	SD	*P* value*
Return to basic activity, day	4.3	1.3	4.6	1.1	0.443
Return to home activity, day	9.6	5.6	12.3	4.4	0.159
Return to work, day	27.1	7.2	29.9	8.9	0.342

*Independent sample t test.

Table 5: Complications (N=30 patients)

Variables	Desarda (*N*=15) [*n* (%)]	Lichtenstein (*N*=15) [*n* (%)]	*P* value*
Ilioinguinal injury	0	0	–
Iliohypogastric injury	1 (6.7)	1 (6.7)	1.000
Testicular edema			
7 days	2 (13.3)	4 (26.7)	0.361
1 month	1 (6.7)	2 (13.3)	0.543
6 months	0	0	–
Testicular atrophy	0	0	–
Inguinal hematoma	3 (20)	2 (13.3)	0.624
Ecchymosis	3 (20)	1 (6.7)	0.283
Seroma			
7 days	2 (13.3)	5 (33.3)	0.195
1 month	0	0	–
SSI	1 (6.7)	4 (26.7)	0.142
Chronic pain	0	1 (6.7)	0.309
Paresthesia	1 (6.7)	1 (6.7)	1.000
Recurrence	0	1 (6.7)	0.309

A *p-value* is a statistical measurement used to validate a hypothesis against observed data.
The lower the p-value, the greater the statistical significance of the observed difference.

DISCUSSION

It's unclear how often and precisely inguinal hernias occur. The lifetime chance of undergoing surgery for an inguinal hernia is rather high, with a frequency of 3% in women and 27% in men[3].

The major objective of this research was to evaluate the effectiveness of the Desarda method, surgical approach, postoperative results and problems, and side effects avoided when employing mesh repair.

This observational prospective research was carried out in the hospital of Assiut University. Thirty male patients with unilateral oblique inguinal hernias following Lichtenstein or Desarda correction participated in this research.

According to the research, the average age of the patients in the Lichtenstein group was 35±11.6 years, whereas it was 34.1±9.8 years in the Desarda group. In a similar vein, the Lichtenstein group included six persons with medical comorbidities or 40% of the total. Twenty percent of patients in the Lichtenstein group and 26.7% of patients in the Desarda group were smokers.

According to our study, the groups did not differ statistically significantly in terms of follow-up time, age, BMI, job status, associated comorbidities, or American Society of Anesthesiologists physical status.

According to Ramu *et al*.[4], the goal of the current research was to evaluate the tissue-based Desarda technique against the conventional Lichtenstein repair when it came to treating primary inguinal hernias. The average age of the patients in the Lichtenstein group was 45.47±13.12, whereas it was 44.94±15.5 in Desarda's group, according to the researchers. Both groups' BMI distributions are similar, with every patient lying between 18.5 and 25 kg/m^2. They found that there was no age difference between the groups that was statistically significant. Between the groups, there was a statistically significant variation in BMI.

Moreover, our research is consistent with that of Neogi *et al*.[5], who examined the feasibility of Desarda tissue restoration at a Central Indian tertiary care hospital as the primary therapy for inguinal hernias. They contrasted this method with Lichtenstein repair based on a number of postoperative variables. They showed that the Lichtenstein group was 44.9 years old, with 16 (34%) smokers, 15 (31.9%) average BMI patients, and 30 (63.8%) overweight patients. The Desarda group's age was 45.1 years, with 19 (39.6%) smokers, 23 (47.9%) patients with average BMI, and 22 (45.8%) patients who were overweight.

Furthermore, our findings align with the research carried out by Yarlagadda[6], which aimed to contrast Desarda's pure tissue-based method with conventional Lichtenstein repair in the treatment of primary inguinal hernias. They revealed that the differences in comorbidities and age between the groups were statistically not significant.

According to the present research, the Desarda group's mean hernia duration was 43.8±9.5 months, whereas the Lichtenstein group's mean hernia duration was 45.7±7.6 months. Unilateral indirect and reducible inguinal hernias affected every participant. Right-sided hernias were seen in 10 (66.7%) patients in the Desarda group and nine (60%) individuals in the Lichtenstein group. In the Desarda and Lichtenstein groups, the mean hernial size was 3.2±0.8 and 3.5±0.9 cm, respectively. Regarding illness duration, kind, laterality, side, size, and reducibility, we discovered no statistically significant difference between the groups.

Moreover, our results are consistent with those of Ramu *et al*.[4], who showed that right-side hernias were more common, occurring there between 50 and 52.8% of the time. Left-sided hernia made up around 27.8% of the cases in Desarda's cohort, while bilateral hernia made up 41.7%. Bilateral hernia occurred for 5.6% of cases in the Lichtenstein group, while left-sided hernia made up 22.2%. However, the P value of 0.06 indicates that the difference was not statistically significant. The Desarda group included 36 patients who were found to have both medial and lateral hernias; 50% of the cases were of each kind. Of the 36 patients in Lichtenstein's research, 47.2% had medial hernias, and 52.8% had lateral hernias.

Our results also align with those of Neogi *et al*.[5], who reported that in the Desarda group, 36 (75%) patients had right-sided hernias, 38 (79.2%) patients had indirect hernias, and 45 (93.75%) patients had reducible inguinal hernias. In the Lichtenstein group, it was discovered that 32 (68.1%) patients had right-sided hernias, 43 (91.5%) had indirect hernias, and 45 (95.7%) had reducible inguinal hernias.

Our results show that the average operating time for patients in the Desarda group was 54.5±8.11 min, while the patients in the Lichtenstein group had an operating time of 59.9±7 min. This is based on the length of the surgeries. Compared to the Lichtenstein group, the Desarda group's operation took less time to complete. However, the difference failed to reach statistical significance.

As to the findings of Ramu *et al*.[4], the Desarda group had an average surgery time of 42.83±1.732, whereas the Lichtenstein group had an average surgery time of 50.72±2.009. With a *P value* less than 0.001,

there was a statistically significant difference of almost 8 min.

Moreover, our results are consistent with the research conducted by Neogi *et al*.[5], which showed that there was a statistically significant difference in the operational time – 14.6 min for the Desarda group and 20.3 min for the Lichtenstein group. The difference in how long the surgery took was attributed to the Desarda repair technique's use of continuous suturing.

Furthermore, the results of Youssef and El-Alfy[7], who demonstrated that group II's operating time (72.3.6±12.2 min) was significantly longer than group I's (59.4±6.3 min) (*P<0.001*), were also supported by the present experiment.

According to our research, patients in the Desarda group spent an average of 1.8±0.4 days in the hospital, while those in the Lichtenstein group spent an average of 2±0.5 days there. The duration of hospital stay did not significantly vary between the two groups.

Moreover, our results are consistent with those of Moghe *et al*.[8], who found no statistically significant difference in the length of hospital stay between the two groups under investigation.

Our results were in opposition to those of Ramu *et al*.[4], who discovered that the Desarda group had an average duration of hospital stay after surgery of 3.38±0.97 days, whereas the Lichtenstein group had an average length of stay of 4.08±0.73 days. In terms of how long each group spent in the hospital, there was a statistically significant difference (*P=0.04*).

The average VAS for pain 14 days after surgery demonstrated statistically significant improvements in both groups, according to the present research (*P=001*). Between-group differences in VAS pain levels at 3 h, 1 2, and 7 days after surgery were not statistically significant.

Moreover, our results coincide with those of Neogi *et al*.[5], who noted a statistically significant difference in pain severity between groups at 2 days and 1 week using the VAS. At 1 month, there was no statistically significant variation in the pain on the VAS between the groups.

According to the research, the Desarda group took an average of 4.3±1.3 days while the Lichtenstein group required an average of 4.6±1.1 days to return to basic activities. The mean duration required to resume domestic activities was 9.6±5.6 days for the Desarda group and 12.3±4.4 days for the Lichtenstein group. The average time it took for people to return to work was 27.1±7.2 days in the Desarda group and 29.9±8.9 days in the Lichtenstein group. According to our research, there was no statistically significant difference in the length of time it took for functional recovery to happen between the groups.

Additionally, Youssef and El-Alfy[7] discovered that there was no statistically significant difference in the time it took for patients in group I to return to work compared to group II patients (17.4±4.2 vs. 18.5±4.8, *P=0.14*), may support our findings.

Our results were at odds with those of Ramu *et al*.[4], who noted how long it took patients in both groups to return to their regular activities after being monitored. In the Desarda group, patients recovered to regular activity in an average of 6.19±0.74 days, whereas in the Lichtenstein group, it took an average of 7.08±1.02 days. In both groups, the length of time the patient returned to work was documented. The average time for patients to return to work in Desarda's group was 14.31±0.822 days, whereas it took 15.33±0.89 days in the Lichtenstein group. Regarding going back to normal and going back to work, there was a significant statistical difference between the two groups (*P=0.001*).

The current investigation found that although no instances of ilioinguinal nerve damage were recorded, one (6.7%) patient in the Desarda group and one (6.7%) patient in the Lichtenstein group had iliohypogastric nerve injury. Testicular edema was seen in two (13.3%) Desarda group patients and four (26.7%) Lichtenstein group patients 7 days after surgery. Furthermore, our results are in line with those of Ramu *et al*.[4], who reported that testicular edema was present in three (8.3%) and four (11.1%) of Desarda's and Lichtenstein's groups, respectively.

The current research also concurred with Youssef and El-Alfy[7], who found that although one (1.4%) patient had an ileo-hypogastric nerve lesion in the Lichtenstein group, two (2.8%) patients in the Desarda group had the same injury.

According to our findings, there were two (13.3%) and three (20%) inguinal hematomas in the Lichtenstein group and Desarda group, respectively. Three (20%) patients in the Desarda group and one (6.7%) patient in the Lichtenstein group both had wound ecchymosis.

Moreover, our results coincide with those of Ramu *et al*.[4], who reported that three (8.3%) of the Desarda's group patients and five (13.9%) of the Lichtenstein group patients had hematoma. According to the research, ecchymosis was reported by three (8.3%) patients in the Desarda group and six (16.7%) patients in the Lichtenstein group.

Similar to Akhtar *et al*.'s[9] findings, the present investigation confirmed that one patient in the Desarda group and four (4.7%) in the Lichtenstein group had hematomas.

It was discovered that one (6.7%) patient in the Desarda group and four (26.7%) patients in the Lichtenstein group had surgical site infections. Two (13.3%) patients from the Desarda group and five (33.3%) patients from the Lichtenstein group had wound seroma 7 days after the treatment. This condition fully disappeared 1 month after the procedure.

Our results show that only one (2.8%) patient in the Desarda group and two (5.6%) patients in the Lichtenstein group developed surgical site infection, which is in line with the conclusions of Ramu *et al*.[4]. According to the research, seroma development occurred in 11.1% of patients in the Desarda group and 19.4% of patients in the Lichtenstein group.

The results of the present research are consistent with those of Akhtar *et al*.[9], who found that postoperative wound infection occurred in six (6%) of the Desarda group and 10 (11.9%) of the Lichtenstein group patients. According to the research, seroma development occurred in eight (9%) patients in the Desarda group and 15 (24.1%) patients in the Lichtenstein group.

Our study's conclusions showed that 6.7% of the Lichtenstein group's participants had ongoing discomfort at the surgery site. In every group, one patient reported having paresthesia. Only one (6.7%) patient in the Lichtenstein group had recurrence. In terms of intraoperative and postoperative difficulties, we found no statistically significant difference between the groups.

The current investigation supports the findings of Ramu *et al*.[4], who showed that both groups had one recurrence after a 6-month follow-up period. When comparing the groups' experiences with hematoma, ecchymosis, surgical site infection, seroma, testicular edema, and recurrence, they did not find any statistically significant differences.

Furthermore, our findings are consistent with the research done by Neogi *et al*.[5], which showed that the Desarda group had 2.3% of chronic pain while the Lichtenstein group experienced 16%. Although the difference was large, it was not statistically significant. None of the groups reportedly suffered from a recurrence. They found that in terms of postoperative issues, there was no statistically significant difference between the groups.

Our research also supports the results of Youssef and El-Alfy[7], who showed that there was no significant difference in intraoperative and postoperative difficulties between the two groups.

CONCLUSION

The current study evaluated the efficacy of the Desarda technique, the surgical procedure, postoperative results, and problems, as well as the benefits of avoiding side effects through the use of mesh repair. When compared to Lichtenstein's mesh repair, Desarda's tissue repair had comparable results in terms of wound infection, recurrence rates, immediate postoperative discomfort, persistent groin pain, and recovery time for returning to normal activities. According to our research, the Desarda treatment may effectively heal hernias without the need for mesh, hence reducing discomfort, much like the standard Lichtenstein operation.

CONFLICT OF INTEREST

There are no conflicts of interest.

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