



Original Article

A Comparative Study of Desarda's Procedure Versus Lichtenstein Mesh Repair in Inguinal Hernia: A Randomised Control Study

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ABSTRACT

Inguinal hernia is a common issue, and its clinical course is often complicated by obstruction and strangulation. In 2009, the European Hernia Society (EHS) strongly recommended the use of the Lichtenstein technique for the repair of primary inguinal hernias. Although it is one of the most commonly performed operations for inguinal hernias, the use of a prosthetic mesh has resulted in an increased incidence of foreign body sensation and chronic groin pain. The Desarda technique described by its pioneer, Prof. M.P. Desarda, makes use of a sling of the external oblique of the patient to reinforce the posterior wall making it a non-mesh repair for inguinal hernias and hence reducing mesh-related complications.

Objectives:

- To compare the efficacy of Desarda's procedure with Lichtenstein mesh repair technique with respect to post operative complications and patient compliance.

Results: Results revealed that the mean operative time was found to be significantly ($p=0.018$) less in Desarda's procedure compared with Lichtenstein mesh repair (51.33 Vs. 57.33 mins; Mean Diff. 6.00 mins). The mean time required to return to normal activities after surgery was also found to be significantly less with Desarda's procedure when compared with Lichtenstein mesh repair (2.50 Vs. 3.77 days; Mean Diff. 1.26 days; $p<0.001$). In addition, feeling of discomfort/foreign body sensation due to mesh was observed in high proportion of patients i.e., 30% in Lichtenstein mesh repair group. The moderate pain was distributed in less percentage of study subjects of Desarda group as compared to Lichtenstein mesh repair group at all time intervals except at 6 months.

Conclusion: Desarda's technique may be considered as an alternative to mesh repair. Desarda repair is easy to perform and has shown to take shorter operative time. Also, there is no need of mesh with less suture material requirement. So, this method proves cost effective than the Lichtenstein method. Desarda hernia repair was found to be superior to Lichtenstein repair in terms of post-operative pain, chronic inguinal pain and foreign body sensation. This study clearly demonstrated that Desarda's procedure could be recommended for inguinal hernia repair.

Keywords: LTF mesh repair, desarda's repair, chronic inguinal pain, foreign body sensation, cost effective

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INTRODUCTION

Inguinal hernia is one of the most common types of abdominal wall hernias, characterized by the protrusion of abdominal contents through a weakness in the inguinal canal. It accounts for nearly 75% of all abdominal wall hernias and has a lifetime risk of approximately 27% in men and 3% in women. The management of inguinal hernia has evolved significantly over the years, ranging from open surgical repair to advanced laparoscopic techniques. Understanding the anatomy, classification, and modern surgical approaches is crucial for effective treatment and prevention of recurrence.

Now generally used procedure is Lichtenstein tension free mesh repair. Dr.MohanP.Desarda reported a novel technique of tissue based hernia repair with very less recurrence rate. Desarda's procedure is based on concept of providing strong and physiologically dynamic posterior inguinal wall without using any prosthetic material.

MATERIALS AND METHOD

This study was a randomised controlled trial. It was carried out in the PG department of Surgery, SNMC Bagalkot, Karnataka from April 2023 to July 2024 after approval from the Ethics Committee and obtaining written and informed consent from the patients.

Inclusion criteria:

1. Age ≥ 18 years
2. Patients diagnosed with uncomplicated unilateral inguinal hernia

Exclusion Criteria:

1. Recurrent hernia
2. Complicated inguinal hernia like obstructed hernia, strangulated hernia
3. Patients who are not willing to give consent

Sample size is calculated using the formula,

$$n = 2(Z_{\alpha} + Z_{1-\beta})^2 \sigma^2 / d^2$$

At 95% confidence level, and 80% power of the study

α (two-tailed) = 0.050 and at 95% confidence level.

β = 0.200 and 80% of power of the study

Where Z_{α} = standard table value for 95% CI = 1.96

$Z_{1-\beta}$ = Standard table value for 80% Power = 0.84

- Sample size estimated is 30
- 30 patients were assigned to Group A, patients undergoing Desarda procedure for inguinal hernia repair, and 30 patients were assigned to Group B, patients undergoing Lichtenstein mesh repair in inguinal hernia.

Patients were kept NPO for 6 hours. Hair clipping was done and Inj. Ceftriaxone 1gm iv was given as pre-op antibiotic. All surgeries were performed under spinal anaesthesia.

Herniotomy:

A 7–8 cm incision was made along the groin skin crease, starting 2 cm above and medial to the pubic tubercle, parallel to the inguinal ligament. Subcutaneous tissue and fascia were dissected to expose the external oblique aponeurosis (EOA) (fig 1), which was incised from the superficial ring to 2 cm lateral to the deep ring. Care was taken to avoid injury to ilioinguinal and iliohypogastric nerves. The spermatic cord was mobilized at the pubic tubercle, and Cremasteric fibers were divided. Vas deferens was identified.

The hernial sac was dissected free from the cord up to the deep ring, twisted, transfixed, and ligated with 2-0 Vicryl (fig 2). Excess sac was excised 1 cm distal to the ligature. Direct hernia sacs were invaginated; large sacs were opened, contents reduced, and adherent sac left in situ.

Posterior wall repair was done using either Lichtenstein or Desarda technique. Operative time was recorded from initiation of repair technique to skin closure.

Desarda Repair:

The upper leaf of the external oblique aponeurosis (EOA) was sutured to the inferior border of the inguinal ligament from the pubic tubercle to the deep ring using continuous 2-0 Prolene (fig 3). The final stitch narrowed the deep ring without compressing the cord.

A 1.5–2 cm strip was created by splitting the upper EOA leaf, extending medially to the rectus sheath and laterally beyond the deep ring. This strip was sutured to the internal oblique/muscle arch with continuous 2-0 Prolene. Cough impulse confirmed tension in the strip. The cord was placed into the new canal, and the lower EOA leaf was sutured over it to the upper leaf. Skin was closed with ethilon, and dressing applied.

Lichtenstein's Mesh Repair:

Following herniotomy, the cord was retracted. A 6×11 cm standard Prolene mesh was shaped to fit the inguinal canal. It was fixed to the posterior wall with the first suture placed 1 cm medial to the pubic tubercle. A slit was made in the lateral mesh (between upper 2/3 and lower 1/3) to pass the cord between the two tails. The cord was lateralized, and the mesh's lower edge was sutured to the inguinal ligament continuously. The upper edge was fixed to the internal oblique using interrupted 2-0 Prolene sutures. Mesh tails were closed around the cord, forming a new deep ring. The cord was placed back, EOA was closed with continuous 2-0 Vicryl, and the superficial ring was adjusted to snugly fit the cord. Skin was closed with ethilon, and dressing was applied.

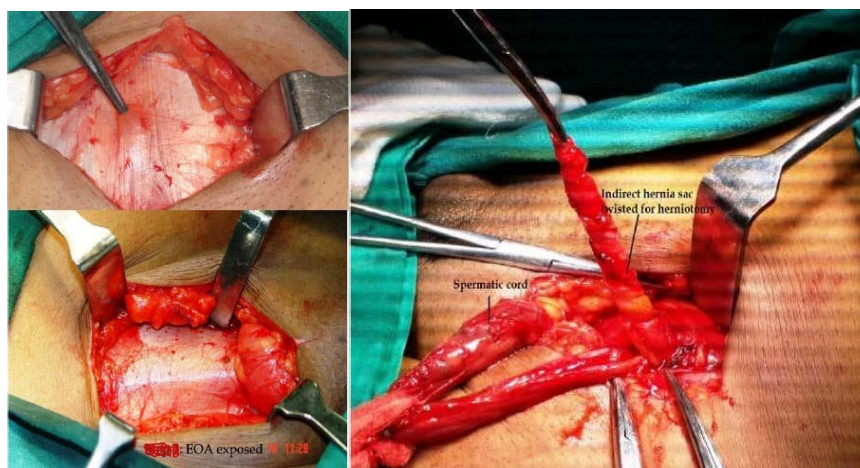


Fig1fig2

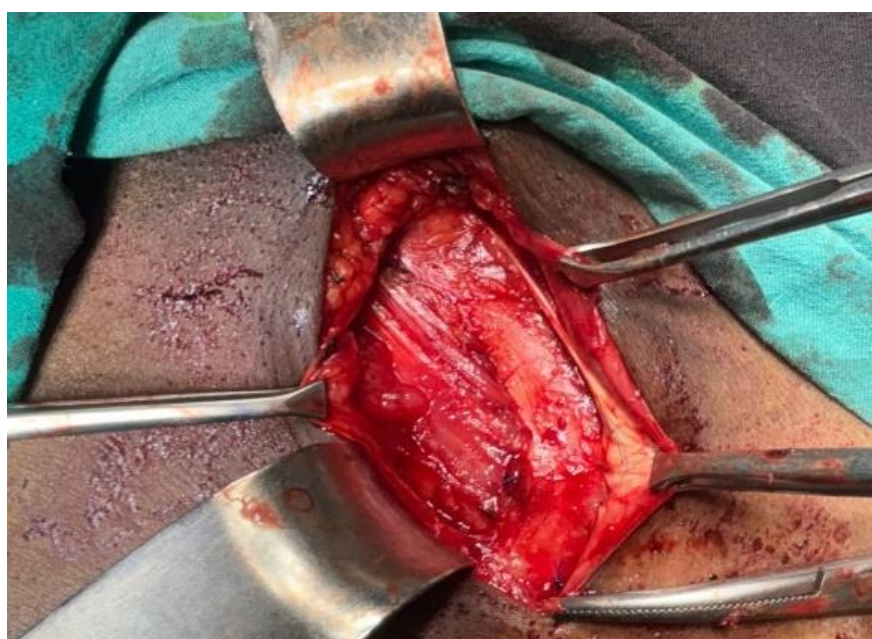


Fig3

Intraoperative picture of Desarda repair

Follow-up

Patients were prescribed IV fluids and IV aqueous dynapar 8 hourly on same day. Patients were allowed oral feeds 8 hours later and shifted from parenteral to oral analgesics SOS. Pain measurement on Visual Analogue Scale and Check-dress with evaluation of stitch line was done on 2nd day and was evaluated for any seroma or hematoma formation or wound infection. Patients were discharged on 3rd to 5th day when able to walk comfortably. In case of wound infection, period of admission was lengthened for treatment. Patients were viewed after 1 week at that time skin sutures were removed and follow up data was recorded. Further follow up was done on patient's visit or by phone call.

Preoperative variables like age, BMI, occupation, addiction, associated illnesses, chief complaints, location of hernia, type of hernia, reducibility, any acute presentation, associated scrotal swelling, intraoperative variables like method of repair, local wound condition, adhesions, intraoperative complications (injury to vas, nerves or vessels) were recorded.

Outcome variables like operative time, cost of surgery, post-operative complications like wound infection, seroma, scrotal swelling, fever etc., post-operative pain score on visual analogue scale (time points were 3rd day, 5th day, at 1 week at 1 month, at 3 months and at 6months), time to return to normal activity in days, foreign body sensation, chronic pain and recurrence were recorded.

RESULTS

30 Desarda repair and 30 Lichtenstein repairs were done . All patients were followed up during post operative period, and after discharge they were followed up by regular visits or by telephone contact.

TABLE 1: DISTRIBUTION OF THE SUBJECTS BASED ON DIAGNOSIS

Diagnosis		Groups		Total
		LTF MESH REPAIR	DESARDA	
Left direct inguinal hernia	Count	3	2	5
	%	10.0%	6.7%	8.3%
Left indirect inguinal hernia	Count	7	6	13
	%	23.3%	20.0%	21.7%
Right direct inguinal hernia	Count	9	4	9
	%	30.0%	13.3%	15.0%
Right indirect inguinal hernia	Count	11	18	28
	%	36.7%	60.0%	46.7%
Total	Count	30	30	60
	%	100.0%	100.0%	100.0%
Chi-square value- 4.56				
p value- 0.472				

Results revealed that, in LTF mesh repair group, majority of the study subjects i.e., 36.7% were diagnosed with Right indirect inguinal hernia followed by Right direct inguinal hernia (30%), Left indirect inguinal hernia (23.3%), and left direct inguinal hernia (10%)

Similarly, in Desarda group, majority of the study subjects i.e., 60% were diagnosed with Right indirect inguinal hernia followed by Left indirect inguinal hernia (20%), Right direct inguinal hernia (13.3%), and Left direct inguinal hernia (6.7%).

However, the distribution of the study subjects based on diagnosis between LTF mesh repair and Desarda groups was not statistically significant ($\chi^2 = 4.56$; $p=0.472$).

TABLE 2: COMPARISON OF THE MEAN OPERATIVE TIME BETWEEN THE GROUPS USING INDEPENDENT SAMPLE T-TEST

Groups	N	Minimum (minutes)	Maximum (minutes)	Mean	SD	Mean diff	p value
LTF MESH REPAIR	30	40.0	75.0	57.33	10.96	6.00	0.018*
DESARDA	30	40.0	70.0	51.33	7.87		

*Significant

Results implied that the mean ($\pm$ SD) operative time was found to be 57.33 ($\pm$ 10.96) mins and 51.33 ($\pm$ 7.87) mins in LTF mesh repair and Desarda groups respectively with the mean difference of 6.00 mins. There was a statistically significant ($p=0.018$) difference was found in mean operative time between LTF mesh repair and Desarda groups.

TABLE 3: DISTRIBUTION OF STUDY SUBJECTS BASED ON THE CHANGES IN PAIN AT DIFFERENT TIME INTERVALS (Pain was scored on a visual analogue scale)

Post Op Time Interval	Pain		Groups		Total	Chi-square value	p value
			LTF MESH REPAIR	DESARDA			
Day 1	Mild	Count	2	6	8	2.71	0.257
		%	6.7%	20.0%	13.3%		
	Moderate	Count	20	19	39		
		%	66.7%	63.3%	65.0%		
	Severe	Count	8	5	13		
		%	26.7%	16.7%	21.7%		
Day 3	Mild	Count	9	23	32	14.52	0.001*
		%	30.0%	76.7%	53.3%		
	Moderate	Count	12	6	18		
		%	40.0%	20.0%	30.0%		
	Severe	Count	9	1	10		
		%	30.0%	3.3%	16.7%		
Day 5	No pain	Count	0	1	1	20.79	0.001*
		%	0.0%	3.3%	1.7%		
	Mild	Count	13	28	41		
		%	43.3%	93.3%	68.3%		

	Moderate	Count	12	1	13		
		%	40.0%	3.3%	21.7%		
	Severe	Count	5	0	5		
		%	16.7%	0.0%	8.3%		
Day 7	No pain	Count	0	1	1	12.06	0.007*
		%	0.0%	3.3%	1.7%		
	Mild	Count	15	26	41		
		%	50.0%	86.7%	68.3%		
	Moderate	Count	14	3	17		
		%	46.7%	10.0%	28.3%		
1 month	Severe	Count	1	0	1	10.80	0.005*
		%	3.3%	0.0%	1.7%		
	Mild	Count	15	15	30		
		%	50.0%	50.0%	50.0%		
	Moderate	Count	12	3	15		
		%	40.0%	10.0%	25.0%		
3 months	No pain	Count	3	12	15	11.04	0.004*
		%	10.0%	40.0%	25.0%		
	Mild	Count	3	1	4		
		%	10.0%	3.3%	6.7%		
	Moderate	Count	8	0	8		
		%	26.7%	0.0%	13.3%		
6 months	No pain	Count	19	29	48	9.23	0.002*
		%	63.3%	96.0%	80%		
	Mild	Count	8	0	8		
		%	26.7%	0.0%	13.3%		
	Moderate	Count	22	30	52		
		%	73.3%	100%	86.7%		

*Significant

Results inferred that the majority of the subjects experience moderate pain in both LTF mesh repair and Desarda group. Distribution of study subjects based on the changes in pain was found to be statistically significant between LTF mesh repair and Desarda groups on day 3 ($p=0.001$), day 5 ($p=0.001$), day 7 ($p=0.007$), 1 month ($p=0.005$), 3 months ($p=0.004$), and at 6 months ($p=0.002$). However, at 6 months there was no pain observed in 73.3% and 100% of subjects in LTF mesh repair and Desarda group respectively.

TABLE 4 : COMPARISON OF THE MEAN DAYS OF RETURN TO NORMAL ACTIVITIES AFTER SURGERY BETWEEN THE GROUPS USING INDEPENDENT SAMPLE T-TEST

Groups	N	Minimum (no. of days)	Maximum (no. of days)	Mean	SD	Mean diff	p value
LTF MESH REPAIR	30	2.0	5.0	3.77	0.82	1.26	0.001*
DESARDA	30	2.0	3.0	2.50	0.51		

*Significant

Results portray that the mean ($\pm$ SD) time required to return to normal activities after surgery was found to be 3.77 ($\pm$ 0.82) days and 2.50 ($\pm$ 0.51) days in LTF mesh repair and Desarda groups respectively with the mean difference of 1.26 days. There was a statistically significant ($p<0.001$) difference was found in mean time required in days to return to normal activities after surgery between LTF mesh repair and Desarda groups.

TABLE 5: DISTRIBUTION OF STUDY SUBJECTS BASED ON THE CHANGES IN SURGICAL SITE INFECTION (SSI) AT DIFFERENT TIME INTERVALS

Post Time Interval	Op	SSI	Groups			Chi-square value	p value
			LTF MESH REPAIR	DESARDA	Total		
Day 3	Absent	Count	30	30	60	-	-
		%	100.0%	100.0%	100.0%		
Day 5	Absent	Count	25	27	52	0.577	0.448
		%	83.3%	90.0%	86.7%		
	Present	Count	5	3	8		
		%	16.7%	10.0%	13.3%		

Day 7	Absent	Count	25	26	51	0.131	0.718
		%	83.3%	86.7%	85.0%		
	Present	Count	5	4	9		
		%	16.7%	13.3%	15.0%		
Day 30	Absent	Count	30	30	1	-	-
		%	100.0%	100.0%	1.7%		
3 months	Absent	Count	30	30	60	-	-
		%	100.0%	100.0%	100.0%		
6 months	Absent	Count	30	30	60	-	-
		%	100.0%	100.0%	100.0%		

Results delineated that SSI was not significantly distributed among study subjects in both LTF mesh repair and Desarda group at all the time intervals monitored for SSI viz. on day 5 ($p=0.448$), and day 7 ($p=0.718$). Furthermore, SSI was completely absent in 100% of the study (i.e., 30/30) in both LTF mesh repair and Desarda groups on day 3, day 30, 3 months, and 6 months

TABLE 6: DISTRIBUTION OF THE STUDY SUBJECTS BASED ON CHRONIC INGUINAL PAIN AFTER 6 MONTHS

Chronic inguinal pain		Groups		Total
		LTF MESH REPAIR	DESARDA	
Absent	Count	23	28	51
	%	76.7%	93.3%	85.0%
Present	Count	7	2	9
	%	23.3%	6.7%	15.0%
Total	Count	30	30	60
	%	100.0%	100.0%	100.0%
Chi-square value- 3.26				
p value- 0.071				

Results inferred that chronic inguinal pain was noticed in high proportion of patients i.e., 23.3% (7/30) of study subjects in LTF mesh repair group when compared to Desarda group i.e., 6.7% (2/30).

TABLE 7: DISTRIBUTION OF THE STUDY SUBJECTS BASED ON POST-OPERATIVE DISCOMFORT/ FOREIGN BODY SENSATION

Discomfort/ foreign body sensation due to mesh		Groups		Total
		LTF MESH REPAIR	DESARDA	
Absent	Count	21	27	48
	%	70.0%	90.0%	80.0%
Present	Count	9	3	12
	%	30.0%	10.0%	20.0%
Total	Count	30	30	60
	%	100.0%	100.0%	100.0%
Chi-square value- 3.75				
p value- 0.053				

*Significant

Results depicted that feeling of discomfort/foreign body sensation due to mesh was observed in high proportion of patients i.e., 30% (9/30) in LTF mesh repair group when compared to Desarda group i.e., 10% (3/30).

DISCUSSION

The gold standard for hernia repair is considered to be Lichtenstein repair, it is a tension-free repair of the inguinal canal making use of a synthetic mesh to reinforce the posterior wall of the inguinal canal. Although it is one of the most commonly performed operations for inguinal hernias, the use of a prosthetic mesh has resulted in an increased incidence of foreign body sensation and chronic groin pain. The Desarda technique described by its pioneer, Prof. M.P. Desarda, makes use of a sling of the external oblique of the patient to reinforce the posterior wall making it a non-mesh repair for inguinal hernias and hence reducing mesh-related complications.⁷ Furthermore, Desarda procedure is a simple procedure that can be done under any type of anaesthesia from general anaesthesia to local anaesthesia.

Furthermore, the main advantages of Desarda procedure includes, being a physiological repair and tension free, pain is comparatively lower in this procedure. Low cost for the patient as mesh is not used. Simple procedure with equal or less

operating time than Lichtenstein's repair. Multiple studies have been done in various countries with good results comparing the procedure with mesh repair. With this scenario, present single blinded randomised controlled study was conducted with the main purpose to compare the efficacy of Desarda's procedure with Lichtenstein mesh repair technique with respect to post operative complications and patient compliance.

In our study, the mean age of study subjects in LTF Mesh Repair and Desarda's technique group was found to be 46.67 years and 41.80 years without significant difference ($p=0.176$). Furthermore, majority of the study subjects i.e., 23.3% and 33.33% were belonged to age group of 61-66 years age group and 31-40 years age group in LTF Mesh Repair and Desarda's technique groups respectively. These findings were comparable with previous studies reported in the literature by various other research investigators. Sahay et al., conducted an institution based prospective observational study to evaluate the surgical outcomes in Desarda versus mesh repair of inguinal hernia. Seventy patients were included out of which 35 patients who underwent mesh repair were placed in group A and other 35 who underwent Desarda were placed in group B. The mean age of study subjects in mesh repair and Desarda's procedure was found to be 50 and 53 years respectively with majority being distributed in age groups of 51-70 years in both the groups.⁶⁹ In another prospective cohort study conducted by Gedam et al., reported that majority of the patients belonged to age group of 50-60 years and 60-70 years in mesh repair and Desarda groups respectively.⁷ Furthermore, Maurya et al., reported mean age of 37 and 40 years in Desarda and Lichtenstein groups respectively.⁶¹

In a study conducted by Dr. Desarda, in 2008 comparing this technique with mesh repairs, he reported that patients in whom the author's technique was performed had a shorter hospital stay, less time to return to work, and fewer complications. In accordance with Dr. Desarda's findings the mean operative time was found to be significantly ($p<0.001$) less with Desarda's procedure compared with LTF mesh repair (51.33 Vs. 57.33 mins; Mean Diff. 6.00 mins) in our study. The mean time required to return to normal activities after surgery was also found to be significantly less in our study with Desarda's procedure when compared with LTF mesh repair (2.50 Vs. 3.77 days; Mean Diff. 1.26 days; $p<0.001$). Moreover, in our study, nil incidences of inguinal hernia recurrences were observed with Desarda's procedure as compared to LTF mesh repair wherein recurrence of inguinal hernia was noticed in 3.3% of study subjects. In addition, feeling of discomfort/foreign body sensation due to mesh was observed significantly ($p=0.002$) high proportion of patients i.e., 60% in LTF mesh repair group in our study.

Previous studies reported in the literature evidenced that postoperative pain was significantly less with Desarda's technique when compared to mesh repair. In consistence with literature studies, in our study also moderate pain was distributed in less percentage of study subjects belonged to Desarda group as compared to LTF mesh repair group at all time intervals. Furthermore, distribution of study subjects based on the changes in pain was found to be statistically significant between LTF mesh repair and Desarda groups on day 3 ($p=0.001$), day 5 ($p=0.001$), day 7 ($p=0.007$), 1 month ($p=0.005$), 3 months ($p=0.002$), and at 6 months ($p=0.002$). However, at 6 months there was no pain observed in 73.3% and 100% of subjects in LTF mesh repair and Desarda group respectively.

In addition, chronic inguinal pain was noticed in high proportion of patients i.e., 23.3% of study subjects in LTF mesh repair group when compared to Desarda's technique group (6.7%).

In our study feeling of discomfort/foreign body sensation due to mesh was observed in high proportion of patients i.e., 30% in LTF mesh repair group.

Although in our study, SSI was not significantly distributed among study subjects in both LTF mesh repair and Desarda group at the all the time intervals monitored for SSI; there were a greater number of surgical site infection observed among study subjects belonged to LTF mesh repair when compared with Desarda's technique group both on day 5 and day 7. These findings depicted that LTF mesh repair was found to be the risk factor of surgical site infection in patients underwent inguinal repair.

CONCLUSION

Desarda's technique may be considered as an alternative to mesh repair. Desarda repair is easy to perform and has shown to take shorter operative time. Also, there is no need of mesh with less suture material requirement. So, this method proves cost effective than the Lichtenstein method. Desarda hernia repair was found to be superior to Lichtenstein repair in terms of post-operative pain and foreign body sensation. It can be recommended for younger patients. This study has shown that the efficacy of Desarda repair in respect to influencing long term outcomes in patients is comparable to Lichtenstein repair. So, it can be safely used as an alternative to conventional method. In infected and strangulated cases, Desarda repair can be used effectively, as risk of mesh infection is eliminated. Also, this technique can eliminate the fear of mesh infection in diabetic patients. This study clearly demonstrated that Desarda's procedure could be recommended for inguinal hernia repair

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Ethical approval: The study was approved by the institutional ethics committee

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