

A Comparative Study between Desarda and Lichtenstein Technique for the Treatment of Inguinal Hernia

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Abstract:

Background: Inguinal hernia is the most prevalent surgical condition affecting young and elderly guys across the globe. Both tissue-based hernia repair and the routinely performed prolene mesh inguinal hernia repair provide several surgical options for treatment. An un-detached strip of external oblique aponeurosis is utilized to reconstruct the posterior wall of the inguinal canal in the newly discovered desarda hernia repair procedure. This research compares the outcomes of Desarda and Lichtenstein mesh hernia repairs.

Methods: 150 patients with inguinal hernia detected in a hospital-based interventional trial were separated into two groups, D (75 patients) for desarda method and L (75 patients) for lichtenstein repair. Postoperative complications such as seroma, hematoma, orchitis, early and late postoperative discomfort, chronic pain, and recurrence were assessed as outcomes. Hospital stay was also considered, and patients are followed up on day 7, one month, and six months following surgery.

Results: During follow-up, 15 patients in the lichtenstein group and 5 patients in the desarda group had chronic pain, which was not statistically significant ($p = 0.260$). In both groups, two recurrences were observed ($p = 1$). Seroma was seen in 5 individuals receiving desarda but none in the L group, although hematoma was more prevalent in the L group.

Conclusion: Desarda, being a novel procedure, may be utilized in young patients to prevent the issues that are most likely to occur with mesh hernia repair.

Keywords: Desarda Repair, Lichtenstein Repair, Mesh, Recurrence, Chronic Pain etc.

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Introduction

Inguinal hernia is a common condition whose frequency increases with age and is more prevalent in men. Its incidence is 386 per 100,000 males and 44 per 100,000 women. The lifetime risk of inguinal hernia is estimated to be 27% for males and 3% for women. The first repair for a hernia was performed in 1559, making hernias as ancient as surgery itself. Currently, surgery is the only treatment option available. In consideration of the architecture and pathophysiology of inguinal hernia, the focus was placed on restoring the anatomical integrity of the inguinal canal by tissue-based techniques or by covering the defect with synthetic material. Until the turn of the century, several procedures for tissue-based surgery had the name of the surgeon who advocated the practice (Marcy, Bassini, Halsted, Mcvay, Shouldice etc.). End of the nineteenth century saw the emergence of the notion of tension-

free defect repair, but it wasn't until 1960 that a suitable biomaterial in the shape of polypropylene mesh became accessible. In 1884, Lichtenstein developed mesh repair, which is the strengthening of the posterior wall of the inguinal canal using a mesh. Since 1990, both transperitoneal (TAPP) and preperitoneal (TEP) endoscopic approaches have been used to conduct hernia surgery. Prior to the 2009 release of The European Hernia Society Guideline (EHS), there was no agreement about the treatment of adult inguinal hernia. For adult inguinal hernia, the European Hernia Society (EHS) highly advocates mesh technique, either open or laparoendoscopic. The Shouldice procedure is regarded as the most effective non-mesh treatment for primary inguinal hernia. Nonetheless, postoperative morbidity impacting quality of life, the expense to the health care system, the sepsis rate, and

understanding the physiological contribution to the pathological process of hernia are also crucial. Dr. Mohan P. Desarda presented in 1998 a revolutionary procedure for tissue-based hernia repair based on the notion of producing a robust, mobile, and physiologically active posterior inguinal wall without the use of a prosthesis. The procedure needs less complex dissection or suturing, requires no mesh, and is simple to master. This research aims to evaluate the clinical outcomes of the conventional mesh-based Lichtenstein repair versus the tissue-based Desarda repair for the treatment of people with primary inguinal hernia.

Objectives of Study: This hospital-based interventional study was conducted at Government Medical College (GMC), Jammu, between May 2021 and April 2022, involving 150 male adult patients diagnosed with primary inguinal hernia (both direct and indirect types) who provided informed written consent and had a good condition of the external oblique aponeurosis, as assessed intraoperatively.

The study aimed to evaluate the technique of inguinal hernia repair using an external oblique aponeurosis strip, assess complications such as hematoma, seroma, orchitis, and postoperative pain, determine recurrence rates and their causes, and compare outcomes with those reported for the Desarda technique and Lichtenstein tension-free mesh repair.

Patients with recurrent, incarcerated, or strangulated hernias, groin infections, or those under 18 years of age or unwilling to provide consent were excluded. All participants underwent detailed clinical evaluation and standard preoperative investigations. Surgical procedures were performed under standardized protocols, and postoperative outcomes were recorded. Randomization was done using sealed envelopes opened immediately prior to surgery, allocating patients to either the Desarda repair or open mesh repair group.

Postoperative outcomes were compared after a one-year follow-up. Data were recorded in a structured proforma and analyzed using a master chart. Ethical clearance was obtained from the institutional ethics committee prior to commencement of the study.

Procedure

Technique of Lichtenstein repair: The hernia was repaired using an onlay piece of mesh that reinforced the inguinal canal floor. A polypropylene mesh of at least 15 × 10 cm was used. The mesh was sewn at least 2 cm medially beyond the pubic tubercle.

The inferior edge of the mesh was sutured to the shelving edge of the inguinal ligament at a spot 2 cm lateral to the internal ring using a continuous nonabsorbable monofilament suture. The mesh was

cut to enable the cable structures to flow through. To anchor the mesh superiorly, interrupted sutures were applied, taking care not to involve any nerves. Frequently, the tails of the mesh extended almost to the anterior superior iliac spine and were positioned smoothly beneath the external oblique laterally. The external oblique aponeurosis was closed over the cord structures with continuous Polypropylene 2/0 suture, whereas the skin was closed with interrupted Nylon 3/0 suture.

Technique of Desarda repair: Through the groin incision, the inguinal canal was enlarged. The thin, delicate fascial layer was preserved as much as possible over the EOA. This procedure reinforces the posterior wall of the inguinal canal. Continuous number 1 monofilament Polydioxanone suture was used to sew the superior leaf of the external oblique aponeurosis to the shelving, in turn, edge of the inguinal ligament.

The first two sutures were made through the sheath of the anterior rectus. The final suture was taken to appropriately and without restriction narrow the deep ring. Using a severing incision that extended 1–2 cm beyond the deep ring laterally and medially to the pubic symphysis, a 2 cm strip of external oblique aponeurosis was created from the sutured superior leaf. This provided us with a strip of external oblique aponeurosis that was already sutured to the inguinal ligament. The strip's medial and lateral attachments were intact.

Using an interrupted number 1 monofilament Polydioxanone suture, the top free edge of the strip was sutured to the conjoint muscle. This led to the placement of an EOA strip behind the spinal cord to establish a new posterior wall.

The cord was positioned inside the canal, and the inferior leaf of EOA was sutured to the freshly developed superior leaf in front of the cord using a continuous Polypropylene 2/0 suture. The skin was sutured using Nylon 3/0 interrupted sutures.

Outcome measure: The major outcomes that were measured were recurrence, persistent discomfort, and foreign body feeling. Secondary endpoints were post-operative pain intensity, operating time, hospital stay, and operation cost.

Return to basic activity was described as the patient's capacity to execute elementary tasks (i.e., dressing, walking, and washing) as well as return to all previously completed activities referred to as work activity.

Chronic post-operative inguinal pain (CPIP) is defined as pain assessed by the patient as > moderate and influencing daily activities for at least six months after surgery.

Statistical analysis: Data were collected by use of interview schedule and from phone calls. Data were

entered into a computer and a data file was constructed. Data were analysed by Fishers' Exact test). Statistical significance was considered as $p < 0.05$. Statistical analyses were done by using SPSS 22.0 (Statistical Package for the Social Sciences by SPSS Inc., Chicago, IL, USA, 2017).

Results

Total 150 patients were included in this study, 75 were operated via LICHTENSTEIN technique and other 75 by DESARDA technique, results were as follows:

Patients Demography: Out of 150 patients, 75 patients were operated with DESARDA with mean age 33.26 and 75 patients were operated with LICHTENSTEIN techniques with mean age 33.54.

Table 1: Age distribution in both the groups

Groups	Number	Mean Age
Desarda	75	33.26
Lichtenstein	75	33.54
Total	150	33.40

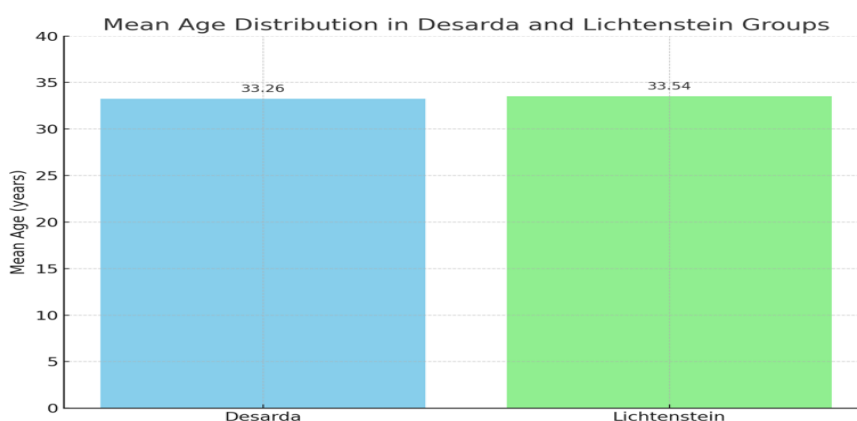


Figure 1:

Sex distribution: Only males were included in the study. 75 were operated with DESARDA and 75 were operated with LICHTENSTEIN techniques

Table 2: Sex distribution in both the groups

Groups	Sex - Male	Total
Desarda	75	75
Lichtenstein	75	75
Total	150	150

Side distribution: Both forms of hernia had 15 instances on bilateral sides, with 30 DESARDA cases and 25 LICHTENSTEIN cases on the left and 30 DESARDA cases and 35 LICHTENSTEIN cases on the right. Pearson the Chi-square test is performed to compare the two groups, and the Chi value is 0.203.

Table 3: Side distribution as per groups

Groups	Side			Total	Significance
	Bilateral	Left	Right		
Desarda	15	30	30	75	P =0.908
Lichtenstein	15	25	35	75	
Total	30	55	65	150	

Distribution as Per Complications

SEROMA formation: Out of 150 patients, only 5 patients have Seroma complication (DESARDA)

Table 4: SEROMA formation in both the groups

Groups	Seroma	Total	Significance
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	No	Yes		
Desarda	70	5	75	P=0.398 (Not Significant)
Lichtenstein	75	0	75	
Total	145	5	150	

Hematoma Formation: Out of 150 patients, only 6 patients have HEMATOMA complication (LICHTENSTEIN)

Table 5: HEMATOMA formation in both the groups

Groups	Hematoma		Total	Significance
	No	Yes		
Desarda	75	0	75	P =0.245 (Not Significant)
Lichtenstein	69	6	75	
Total	144	6	150	

Orchitis: Out of 150 patients, only 1 patient has ORCHITIS complication (LICHTENSTEIN)

Table 6: ORCHITIS in both the groups

Groups	Orchitis		Total	Significance
	No	Yes		
Desarda	75	0	75	P=1 (Not Significant)
Lichtenstein	74	1	75	
Total	149	1	150	

Early post op pain: Fishers' Exact test is used for comparison of both the groups. There is significant difference found in our study in DESARDA and LICHTENSTEIN group respectively.

Table 7: Early post op pain

Groups	Early Post Op Pain(<3 Days)		Total	Significance
	No	Yes		
Desarda	73	2	75	P=0.004 (Significant)
Lichtenstein	60	15	75	
Total	133	17	150	

Late post op pain: While comparing the two groups on the basis on late post operation pain (< 3 days), significant difference was observed.

Table 8: Late post operation pain

Groups	Late Post Op Pain(>3 Days)		Total	Significance
	No	Yes		
Desarda	71	4	75	P= 0 (Significant)
Lichtenstein	55	20	75	
Total	126	24	150	

Early and Late Postoperative Pain in Desarda and Lichtenstein Groups

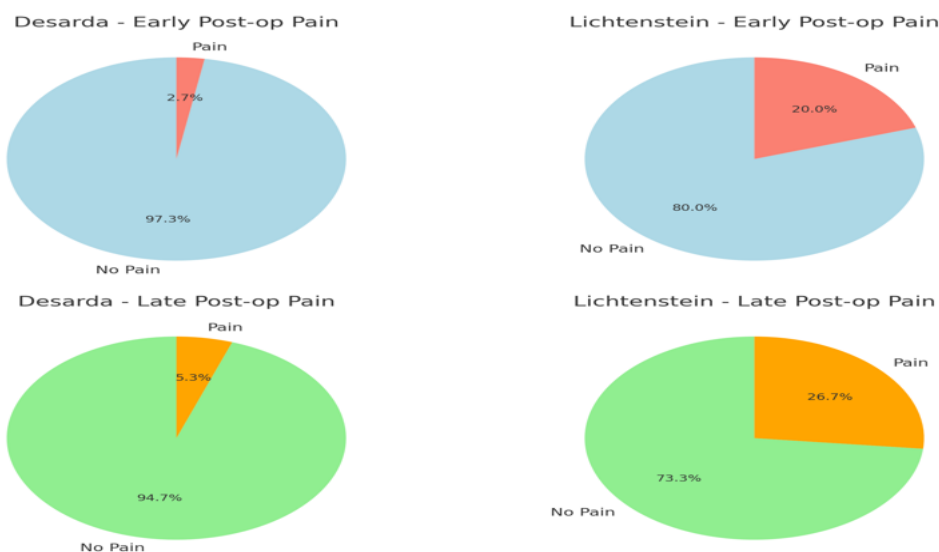


Figure 2:

Distribution as Per Hospital Stay: While comparing the two groups on the basis on late post operation pain (< 3 days), no significant difference was observed.

Table 9: Distribution as Per Hospital Stay

Groups	Hospital Stay			Total	Significance
	< 3 Days		<3 Days		
Desarda	70	5	75	P= 0.316 (Not Significant)	
Lichtenstein	68	7	75		
Total	138	12	150		

Distribution as Per Chronic Pain: While comparing the two groups on the basis on late post operation pain (< 3 days), no significant difference was observed.

Table-10: Distribution as Per Chronic Pain

Groups	Chronic Pain		Total	Significance
	No	Yes		
Desarda	70	5	75	P= 0.260 (Not Significant)
Lichtenstein	60	15	75	
Total	130	20	150	

Distribution as Per Recurrence: While comparing the two groups on the basis on late post operation pain (< 3 days), no significant difference was observed.

Table 11: Distribution as Recurrence

Groups	Recurrence		Total	Significance
	No	Yes		
Desarda	73	2	75	P= 1 (Not Significant)
Lichtenstein	73	2	75	
Total	146	4	150	

Discussion

In this study, there were substantial differences between early and late postoperative pain in both groups, but there were no significant differences between other parameters. Even according to EHS recommendations, the current results of hernia therapy range from moderate to exceptional. In hernia-specialized facilities, the typical recurrence

rate for the conventional Lichtenstein procedure is 1%, but in community hospitals it is around 4%, and in other studies it is over 18%. Published information for various mesh methods varies:

- 0 to 4.2% recurrences for Prolene Hernia System (PHS),
- 0 to 4% for Rutkow
- 1.6 to 19.0% for the (TAPP)

The reported incidence of postoperative complications ranges between 15% and 28%. With diligent postoperative surveillance, the frequency might rise up to fifty percent.

Seroma, hematoma, persistent pain, surgery site infection, and recurrence were the most often reported consequences. Death and significant deterioration in the quality of life of operated patients were uncommon but documented. These results indicate the need for more clinical study. There are several current research to enhance the method of inguinal hernia repair.

Lightweight prolene meshes, composite meshes, and other biologic prosthesis that are commercially available are being evaluated. The scientific study to optimize hernia surgery and reduce complications is ongoing. Additionally, tissue-based treatments are not out of the question in the hernia sector.

This tissue-based Desarda approach for inguinal hernia repair is a unique procedure. The application of the external oblique aponeurosis in the form of an undivided strip (which strengthens the posterior wall of the inguinal canal) is being established as a novel idea in tissue-based hernia repair, despite criticisms raised by certain writers. McArthur and Andrews or Zimmermann recommended the use of the external oblique aponeurosis in the past; yet, this procedure is original, distinct, and novel in comparison.

This innovative mending technique completes Lichtenstein's "no stress" philosophy. The aponeurotic strip is moved from the anterior wall to the posterior wall of the inguinal canal without extra stress at the posterior wall. Original and intriguing is the notion of an undivided, movable aponeurotic strip that "physiologically" reinforces the posterior wall of the inguinal canal. When referring to Desarda as "dynamic enforcement" of the posterior inguinal canal wall, Lichtenstein might be referred to as "prosthetic enforcement." The creator of the first technique hypothesizes that a naturally displaced and moveable aponeurotic strip is far more "physiological" than scar tissue created around a synthetic prosthesis for developing an anti-reherniation mechanism.

The Shouldice approach, which is still widely used today, is also tissue-based. There is no such study comparing aponeurotic tissue with transversalis fascia to date.

Primarily based on research on transversalis fascia, the qualities of inguinal connective tissue are being generalized. Only 20 to 30 percent of individuals have both genetic and metabolic alterations. Assuming 15 to 20% recurrences following some tissue-based procedures, 80 percent of patients survive without recurrence. It is possible to hypothe-

size that there is a subset of hernia patients for whom tissue-based procedures might be employed safely.

Comparing complications between the two groups, such as seroma, hematoma, orchitis, etc., we found no statistically significant difference in our study. The incidence of recurrence was same in both groups, and one in each group. Clearly, the recurrence in the Desarda group was due to a technological mistake. The produced aponeurotic strip was lengthy, leading in the formation of a large, deep inguinal ring and re-herniation. The recurrence was typical in the Lichtenstein group. This further reinforces the notion that surgical technique is essential for optimal outcomes. Although the International Association for the Study of Pain defines chronic pain as lasting more than 3 months, in our study we defined chronic pain as lasting more than 6 months due to the use of prolene mesh for hernia repair and the fact that inflammatory response to foreign material may last longer. Numerous additional authors have employed this method, which is advocated in the most recent publications.

In our study, 5 patients in the Desarda group and 15 patients in the Lichtenstein group developed persistent discomfort, likely due to nerve entrapment after mesh hernioplasty. This distinction was also not statistically significant.

Comparing the parameters of early and late postoperative pain, which were defined as occurring less than three days after surgery and more than three days after surgery, respectively, only two patients in the Desarda group experienced early post-operative pain compared to 15 patients in the Lichtenstein group, which is statistically significant. Only four patients in the Desarda group reported late postoperative discomfort, whereas 20 patients in the Lichtenstein group did, which is statistically significant. In all groups, pain was assessed with the use of a visual analog scale. Compared to hospitalization, no statistically significant result was seen.

The action of the prolene mesh on the surrounding tissues might explain the greater ratio of hematoma and seroma following Lichtenstein technique application. This is consistent with previous research and the known toxicity of polypropylene to tissue. Both groups reported similar levels of foreign body feeling and abdominal wall stiffness, and the results are within the range (4.5%–43.8%) described by other authors for mesh procedures. Surprisingly, patients from both groups reported mesh-related symptoms equally, and these sensations did not change after 6 months of follow-up or after participants were told of the procedure utilized.

Mitura and Roman-czuk have published the findings of a six-month follow-up analysis of the Desarda and Lichtenstein methods. They saw no

recurrence, and pain after six months was equivalent in both groups (VAS ratings of 8 versus 11 in the Desarda and Lichtenstein groups, respectively; $p=0.691$).

Situma et al. reported their findings on Desarda versus modified Bassini inguinal hernia repair, noting that there was no difference in terms of discomfort and return to normal activities.

Desarda and his team reported further findings based on a comparison between their approach and the Lichtenstein technique. There was no recurrence among the 269 Desarda patients and 1.97 percent among the 225 mesh patients. One year after surgery, 6.49 percent of mesh patients and none of the Desarda patients complained of chronic discomfort. Despite several methodological deficiencies in the offered publications, the Desarda technique demands further attention and greater efficacy than the Lichtenstein group.

In the current world, the expense of surgery has become the central problem. The expense of inguinal hernia therapy is not trivial, especially in Africa and Asia's developing nations. A benefit of the Desarda approach is its low cost. This is why several authors who have lately published studies have shown an interest in this method. The Desarda procedure is inexpensive since a synthetic prosthesis is not utilized. In underdeveloped nations, the price of composite mesh might be a significant challenge. In addition to economic concerns, the use of synthetic materials in young patients remains contentious. The effects of placing polypropylene within the human body for a lifetime are unclear. Also, there are emerging reports of sexual dysfunction following mesh implantation, hence many surgeons avoid mesh prosthesis for hernia repair in young patients. Desarda is also a tissue-based approach that may be employed in a polluted surgical area, as is typically the case with strangulated hernias.

Conclusion

This randomized controlled experiment revealed that the outcomes of inguinal hernia repair using the Desarda approach are comparable to those of traditional Lichtenstein surgeries throughout a one-year and six-month period in terms of recurrence, chronic pain, surgical complications, hospital stay, etc. Comparing early and late postoperative discomfort as well as cost effectiveness, the Desarda approach is much superior. Based on these findings, this technology has the potential to increase the number of tissue-based treatments for groin hernias. The most important indications for usage of the Desarda approach are alternative repair in young people, in polluted operation fields, in the presence of socioeconomic concerns, or if a patient is not ready to employ mesh.

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