

**ORIGINAL RESEARCH****Correlative Evaluation study of Desarda's tissue Based Repair Technique and Lichtenstein Mesh Hernioplasty in Treatment of Inguinal Hernia****Ankith Yarlagadda<sup>1</sup>, K. Shankar Reddy<sup>2</sup>, Satish Kumar Raju S.<sup>3</sup>**

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**ABSTRACT**

**Background:** To compare the main inguinal hernia repair using a pure tissue-based approach to the traditional Lichtenstein repair.

**Material and Methods:** 170 cases were divided into 2 groups for our study. Lichtenstein denoted as group L had 87 patients, whereas Desarda group D had 83 patients. Early (within 1 year) inguinal hernia recurrence was the main factor in the outcome. Treatment time from surgical intervention to skin closure was a secondary outcome factor. Visual analogue scale scores for postoperative pain were calculated. It was calculated how long it would take to resume routine activities at home. Postoperative problems included cord oedema, groin pain, seroma, fever, wound infections, persistent pain, etc.

**Results:** One recurrence is detected in each arm after a 15-month mean follow-up period ( $P=1$ ). In Lichtenstein, the operational time was  $73.89 \pm 12.63$  min, whereas the repair time was  $72.60 \pm 13.89$  min ( $P=0.508$ ). When compared to the Lichtenstein group, postoperative pain was significantly lower in the group's first seven post-operative days ( $P=0.09$ ). The amount of time needed to resume routine activities at home and in the group was significantly lower ( $P = 0.001$ ). Between the two trial arms, there was no statistically significant difference in the rates of post-operative complications.

**Conclusion:** The outcomes of the Desarda approach for treating inguinal hernias are comparable to those of conventional Lichtenstein surgeries. The Desarda method does not employ a mesh. Patients who undergo Desarda's surgical treatment recover from it more quickly than those who receive the traditional Lichtenstein mesh repair. Less postoperative pain, same consequences to method standardisation. The Desarda procedure may increase the selection of tissue-based groin hernia treatment options.

**Keywords:** Desarda tissue repair, Lichtenstein mesh hernioplasty, Primary Inguinal hernia, Tissue based repair.

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**INTRODUCTION**

A hernia is when a viscus or a portion of a viscus elongates through an unusual opening in the wall of the cavity in which it is contained.<sup>[1,2]</sup> Hernias can develop anywhere on the body, but the majority affect the front abdominal wall, notably the inguinal area. Whether or not this is done, an inguinal hernia is a protrusion of the contents of the abdominal cavity or pre-

peritoneal fat via a defect in the inguinal area.<sup>[2]</sup> The majority of hernia patients complain of pain or discomfort as well as groyne swelling, particularly when activity, coughing, or bowel movements cause an increase in intra-abdominal pressure. Throughout the day, pain worsens and subsides when resting down. Due to their prevalence, inguinal hernias continue to be a significant surgical issue. Inguinal hernia risk is estimated to be 27% for men and 3% for women over the course of a lifetime. Between 100 and 300 inguinal hernia patients per 100,000 die each year.<sup>[2,3]</sup>

The European Hernia Society approved mesh-based treatments, notably the Lichtenstein technique and laparoscopic methods, for the treatment of symptomatic inguinal hernia in adults. Among the several open mesh procedures, the Lichtenstein approach is currently the one with the lowest perioperative morbidity.<sup>[3,4]</sup> It is regarded as standard of care for those with inguinal hernias. However, issues like the feeling of a foreign body, wound infection, cord fibrosis, chronic discomfort, and recurrence (2%) are of significant concern. Mesh serves as a mechanical barrier, but it does not offer a posterior wall that is physiologically flexible and dynamic. Synthetic prosthesis has the potential to lead to new clinical issues like abdominal wall stiffness, pain, and groyne foreign body sensation that could have an impact on the patient's day-to-day activities. Infections at the surgical site are more common following mesh-based hernia surgeries.<sup>[4]</sup> Meshoma or plugoma tumours may develop around the mesh prosthesis as a result of a severe chronic inflammatory response that is often linked to a foreign body reaction; treating these tumours presents a new surgical challenge. Chronic scarring may also result in vas deferens blockage, which can impair erection and lower conception rates. A unique method of tissue-based hernia repair with very low recurrence was described by Dr. Mohan P. Desarda.<sup>[5,6]</sup>

Desarda repair is founded on the idea of supplying a powerful, mobile, and physiologically dynamic posterior inguinal wall without the use of any prosthetics. To strengthen the posterior wall in this instance, an undetached strip of external oblique aponeurosis is stitched to it in place of mesh. The method is simple to learn, needs less difficult dissection or suturing, doesn't require mesh, and produces results that are at least as good as Lichtenstein repair. Desarda suggested that the adoption of a strip of external oblique aponeurosis (EOA) is the best substitute for either mesh or the Shouldice repair since the ageing process is limited in tendons and aponeurosis.<sup>[6,7]</sup> The external and internal oblique muscles' contractions, which transformed the strip of EOA into a "shield" to prevent re-herniation, allowed the author to show that his repair was dynamic in nature. Additionally, he demonstrated how the EOA strip supported the transversalis fascia and decreased the likelihood of herniation behind the strip.<sup>[7,8]</sup> While Bassini's repair is frequently used in situations of strangulation, Lichtenstein repair is carried out in study centres. According to a study by Cocuzza et al., prosthetic mesh has long-term negative effects on the vas deferens that lead to azoospermia. Numerous investigators adopted innovative hernia repair methods as a result of the postoperative dysfunctions and problems they found.<sup>[8-10]</sup>

Our study examined the results of the straightforward inguinal hernia repair procedures developed by Lichtenstein and Desarda. Therefore, a prospective observational study is conducted to compare the recurrence rates and the postoperative morbidity between Desarda's technique and Lichtenstein's technique for uncomplicated inguinal hernias in terms of immediate postoperative pain, chronic groyne pain, wound infection, and the time taken to return to activities of daily living (ADL).

## **MATERIALS & METHODS**

The study was conducted at Department of Surgery, Ayaan Institute of Medical Sciences, Kanakamamidi Moinabad, Telangana, India, a study was conducted to compare the two

hernia repair techniques. Patients with inguinal or inguinoscrotal hernia during the time period of 24 months June 2021 to July 2022 were included in the study. The study consisted of two groups for total 170 patients. Group L (87) for Lichtenstein and Group D (83) for Desarda repair. The trial was open to all individuals who had inguinal or inguino-scrotal hernias.

#### Inclusion Criteria

1. Above age 18 years
2. Patients with inguinal or inguino-scrotal hernia

#### Exclusion Criteria

1. Under age of 18 years
2. Complicated inguinal hernia viz., obstructed, strangulated, and gangrenous hernia, recurrent inguinal hernia
3. Thin, weak or divided external oblique aponeurosis intra-operatively.

**Methodology:** Preoperative evaluation of each patient included a history review, physical examination, and routine laboratory tests. As part of the pre-anaesthetic work up, older patients were subjected to additional investigations to look for potential comorbid health problems. Patients were split into two groups and given the option of tissue-based or Lichtenstein mesh-based repairs (L group) (D group).<sup>[10]</sup> Randomization and patient desire were used to allocate patients to various surgical procedures. While the remainder of the units in the department used the Lichtenstein repair technique, all of the patients receiving the Desarda technique treatment were under the care of a single surgical unit. Following a thorough pre-anaesthetic evaluation, anaesthesia was used in accordance with the anesthetist's judgement. In all surgeries, an oblique inguinal incision was employed. The external oblique aponeurosis (EOA) was dissected and evaluated. From the point of skin incision through skin closure, the operating time was calculated.

## RESULTS

**Table 1: Comparison of baseline characters of two groups**

Variables	Lichtenstein (n= 87)	Desarda(n=83)	P-Value
Age (Mean±SD)	43.32 ± 14.06	41.75 ± 18.02	0.304
Gender	87 M	82 M/1F	NA
	<b>Comorbid conditions</b>		
Hypertension	34(39.08%)	28(32.94%)	0.442
Diabetes	24(27.58%)	20(23.52%)	0.608
Smoking	29(33.33%)	31(36.47%)	0.754
Ghutka	30(34.48%)	27(31.76%)	0.753
Alcohol	30(34.48%)	34(40.00%)	0.446
Chronic cough	24(27.58%)	23(27.05%)	1
Asthma	2(2.29%)	6(7.05%)	0.164
Stricture/BHP	9(10.34%)	5(5.88%)	0.406

Mean age of lichtenstein and desarda group was 43.32 ± 14.06 and 41.75 ± 18.02 respectively comorbidity condition in lichtenstein and desarda are noted.

**Table 2: Age distribution of patients**

Age in years	Lichtenstein number of patients (%)	Desardanumber of patients (%)	P Value
18-30	13[14.94%]	18[21.66%]	0.083

>30-40	15[17.24%]	12[14.45%]	0.624
>40-50	18[20.68%]	10[12.04%]	0.447
>50-60	26[29.88%]	14[16.86%]	0.918
>60-70	14[16.09%]	22[26.50%]	0.176
>70	1[1.14%]	7[8.43%]	NA
Total	87[100%]	83[100%]	0.304

Mean age: 48.52 years. Standard deviation: 16.14. The baseline characteristics like demographic profile, comorbid conditions on comparison were similar in both the groups.

**Table 3: Comparison of clinical characters**

Variables	Lichtenstein (n ¼ 87)	desarda (n ¼ 83)	P Value
Duration of hernia (In months) (Mean±SD)	11.65 ± 16.65	14.20 ± 29.28	0.462
Side of hernia(Right/Left)	63/32	61/31	1
Type of hernia (Direct/ Indirect)	36/59	32/60	0.762

Clinical characters and hernia features were compared with no statistical differences.

**Table 4: Showing intraoperative and post-operative variables**

Variables	Lichtenstein (n = 87)	Desarda(n = 83)	P Value
<b>Operative time (In minutes)</b>	<b>73.89 ± 12.63</b>	<b>72.60 ± 13.89</b>	<b>0.508</b>
<b>Postoperative pain scores (Sheffield's pain scale)</b>			
POD 1	2.72 ± 0.44	2.43 ± 0.61	0.0003
POD 3	1.56 ± 0.61	1.29 ± 0.65	0.0034
POD 7	0.46 ± 0.54	0.27 ± 0.44	0.009
POD 30	0.05 ± 0.26	0.01 ± 0.10	0.16
POD 90	0.02 ± 0.20	0.00 ± 0.00	0.32
Return to basic activity (Days)	3.30 ± 1.13	2.54 ± 0.85	0.001
Return to home activity (Days)	6.23 ± 2.02	5.56 ± 1.59	0.013
Follow up period (2-25 month)	14.70 ± 3.67	15.79 ± 4.94	0.088

Up until the seventh postoperative day, there was a statistically significant difference in the reported pain scores. Compared to the Lichtenstein repair procedure, patients who underwent surgery using the Desarda technique experienced much less discomfort through POD 7. According to statistical calculations, the average number of days it took to resume normal daily activities and household chores was statistically significant with P values under 0.05. In the first seven days following surgery, it is evident that the pain scores in the group are much lower. However, as the length increases, the pain scores become nearly identical, and after one month of the postoperative period, there is no difference in pain between the two groups. Both Lichtenstein and have comparable complication rates, according to comparison and evaluation of complications seen post-operatively. All P Values are >0.05, which is statistically not significant.

**Table 5: Showing comparison of complication rates between the 2 groups**

Variables	Lichtenstein (n = 87)	Desarda (n = 83)	P Value
<b>Early complications (&lt;30 days)</b>			
Fever	6(6.89%)	5(6.02%)	1

Cord oedema	8(9.91%)	5(6.02%)	0.31
Groin discomfort	4(4.59%)	3(3.61%)	1
Seroma	2(2.29%)	2(2.40%)	0.679
Surgical site infection	1(1.14%)	1(1.20%)	1
<b>Late complications (&gt;30 days)</b>			
Chronic pain	1(1.14%)	0	1
Neuralgia	0	0	1
Foreign body sensations	0	0	1
No complications	65(74.71%)	70(82.60%)	0.159
Recurrence	1(1.14%)	1(1.08%)	1

Regarding postoperative fever, cord oedema, groin pain, seroma, surgical site infection, persistent pain, neuralgia, and feelings of a foreign body, there was no discernible difference. During the one year follow up, there was one recurrence in both the Lichtenstein arm and the other arm. The recurrence was close to the pubic tubercle in the Lichtenstein group and the deep ring in the group.

## DISCUSSION

The inguinal hernia repair procedure is the most frequent general surgery operation done. In order to achieve the lowest possible recurrence rate, a tension-free closure of the hernia defect is essential for the surgical treatment of inguinal hernias. Prior to the development of Lichtenstein tension-free repair, Bassini's repair and its variants were the standard of care for inguinal hernia. Following that, the options for tissue-based repairs like Shouldice and Bassini's fixes were restricted.<sup>[11,12]</sup> Recurrence rates of 8.6% and 11% after Bassini and McVay repairs, respectively, were reported in a significant multi-center controlled experiment.

The Lichtenstein mesh repair method's underlying theory was the use of prosthetic material to induce fibrosis and so reinforce the posterior wall of the inguinal canal. The majority of the criteria for the optimum hernia surgery are met, but the mesh-related problems are described.<sup>[12,13]</sup> There are several more recent prosthetic materials (Biomaterials) available now, but it is still unclear whether these materials can be used to treat inguinal hernias. As a result, researchers are looking for the best surgical technique for inguinal hernias, one that is affordable, has low complication and recurrence rates, is operable by consultants and surgeons in training at smaller and district hospitals, is simple to learn, and allows for a quick return to normal activities. The majority of the requirements for an excellent technique are met by the Desarda technique.<sup>[13,14]</sup>

Desarda uses external oblique aponeurosis to fortify the inguinal canal's posterior wall. With a 1.8% complication rate and a 0.2% recurrence rate, the author says that his results are on par with or better than those of Shouldice and Lichtenstein repairs. This method has only been assessed in three randomised control trials. In order to treat primary inguinal hernias, the Desarda approach was compared to the traditional Lichtenstein procedure for clinical results, postoperative pain, comorbidities, and early recurrence.<sup>[14,15]</sup>

Within a year of surgical repair, one patient in the Lichtenstein group and one in the Desarda group in this study experienced recurrence ( $P = 1$ ). The recurrence was close to the pubic tubercle in the Lichtenstein group and the deep ring in the Desarda group. Desarda reported no recurrence in his procedure versus 1.9% recurrences in the mesh group in a clinical trial at

a small district hospital in India comparing his technique to the Lichtenstein repair. 1.9% recurrence in Lichtenstein and 1.94% in the Desarda group were reported by Szopinski et al. Studies by Youssef et al., Z Abbas et al., Rodriguez et al., and Mitura et al. all produced similar P values.<sup>[16]</sup>

In the first seven postoperative days, postoperative pain in the Desarda group was considerably lower than in the Lichtenstein group ( $P=0.09$ ). This discovery was not made by Youssef et al., Z Abbas et al., or Mitura et al. in any previous work. Numerous confusing elements, such as intraoperative tissue handling, nerve traction, and manipulation, may be to blame for this.<sup>[16,17]</sup> It is possible that patients who underwent surgery using the Desarda technique become ambulatory sooner and resume basic daily activities before those who underwent surgery using the Lichtenstein repair ( $P=0.001$  and  $P=0.013$ , respectively). Less tissue manipulation, fewer dissections, and postoperative pain with the Desarda approach may contribute to an earlier return to normal activities at home. Similar findings were reported by Youssef et al., Z Abbas et al., Mitura et al., and Desarda et al.<sup>[17]</sup> The length of the procedure is a surgeon-dependent variable and reflects how simple the procedure is. Unlike earlier research, where just the time required for repair was taken into account, the operating time in the present investigation was calculated from the skin incision to the skin closure. The average operating time for Lichtenstein was  $73 \pm 13.63$  minutes and for Desarda repair it was  $72 \pm 13.89$  minutes. ( $P = 0.5$ ).<sup>[17,18]</sup> Statistics showed that it was not significant. The same operating time is related to the fact that in a Desarda repair, cutting and fixing the external oblique aponeurosis take about the same amount of time. In contrast to our findings, Youssef et al. and Rodriguez et al. reported significant disparities in operative time.<sup>[18,19]</sup> There was a 1.05% incidence of chronic pain in the Lichtenstein group and a 1.08% incidence in the Desarda group in the current trial, although there was no statistically significant difference ( $P=1$ ). According to literature, the prevalence of chronic pain ranges from 1.1-6.49% in Lichtenstein and from 0.8-4.8% in the Desarda group. There is no statistically significant difference between the two trial arms for post-operative complications. High incidence of seroma was documented in the Lichtenstein group by Szopinski et al. Desarda et al. noted a threefold increase in complications in the Mesh group. Cord oedema was the most common consequence in our study. According to some surgeons, connective tissue defects and aberrant collagen metabolism are the causes of hernias. These surgeons are opposed to the Desarda method. Shouldice technique is still acceptable despite being a pure tissue healing treatment. Desarda, a pure tissue-based hernia repair technique, should be taken into consideration when developing standard treatment recommendations for inguinal hernias, in our opinion. Mesh is a great replacement for the EOA strip. The strip is a physiological, natural, and widely accessible prosthesis for bolstering the inguinal canal's posterior wall. We believe it's critical to precisely identify patients who can benefit from pure tissue-based repairs.<sup>[19]</sup> The Desarda procedure is most frequently used in cases of young patients, strangulated inguinal hernias, budgetary restraints, and when the patient objects to the use of mesh. Recurrence may result from the use of originally diseased tissue for healing. Since the data were only evaluated over a short period of time—the mean follow-up period was only 15 months—they only reflect short-term outcomes.<sup>[19,20]</sup> The current study is a longitudinal study in which patients were assigned to the 2 groups systematically rather than randomly. However, as this is not a randomised control trial, there is undoubtedly an allocation bias. However, in order to make up for the lack of randomization, the two groups were compared on the basis of baseline characteristics, not in order to remove bias but rather to demonstrate that the two groups are similar even in the absence of randomization, and the results obtained between the two groups have similarities that may be related to surgical intervention.<sup>[20]</sup> Criteria for exclusion had 18-year-old patients with difficult inguinal hernias.

Patients with inguinal hernias, obstructions, strangulations, and gangrene were discovered to have thin, frail, or divided external oblique aponeurosis during surgery. The complicated patients were totally eliminated from the Lichtenstein (L group) arm as well as similar exclusions.

## CONCLUSION

Over a mean follow-up period of 15 months, the outcomes of inguinal hernia therapy using the approach used in the study are comparable to those following conventional Lichtenstein surgeries. Since this method does not employ a mesh, it is simple to learn and makes repairs affordable. In comparison to the conventional Lichtenstein mesh repair, patients recover from surgery faster and can walk around more quickly. Less Postoperative discomfort and morbidity consistent with usual procedure. However, the primary weakness of the approach, weak external oblique aponeurosis or EOA with split fibres, is where Lichtenstein technique excels. To assess this repair further, large-scale, long-term multicentric randomised control trials must be done. The procedure has the potential to increase the number of tissue-based techniques for treating groin hernias that are now available.

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