



## RESEARCH ARTICLE

### A COMPARATIVE STUDY OF LICHTENSTEIN MESH REPAIR VS NON MESH TISSUE REPAIR DESARDA'S TECHNIQUE FOR INGUINAL HERNIA REPAIR

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#### Abstract

**Introduction:** Inguinal hernia is one of the most common problems encountered in surgery OPD with the necessity of surgical operation in most cases<sup>[1]</sup>, multitudinous procedures have been proposed for inguinal hernia surgery like Bassini's, Shouldice and other tissue repair techniques. Now generally used procedure is Lichtenstein tension-free mesh technique<sup>[2]</sup>. Desarda's method is tissue-related procedure of hernia surgery using an undetached strip of external oblique aponeurosis to strengthen the posterior wall of the inguinal canal. This study deals with the comparison of the Lichtenstein technique and Desarda's technique for uncomplicated inguinal hernia<sup>[9,10,11]</sup>.

**Aim:** To find the Effectiveness of Non-Mesh tissue technique (Desarda) in comparison with mesh technique (Lichtenstein)

**Settings and Design:** Prospective study.

**Materials and methods:** All cases with age ranging from 21 years to 60 years with uncomplicated inguinal hernia admitted to the Department of General Surgery of our institute, between August- 2021 and July- 2022 were included.

**Results:** It was observed that there was no significant difference in the rate of recurrence, inguinodynia between Lichtenstein's technique and Desarda's technique of inguinal hernia surgery. The mean duration of stay in hospital and mean duration return to normal activities was more in cases who underwent surgery by Lichtenstein's technique. Complications like surgical site infection, seroma, haematoma and post-operative pain on 1st, 3rd and 5th day were more in cases who underwent surgery by Lichtenstein technique than compared to Desarda's technique.

**Conclusion:** Desarda's no mesh technique was observed with similar results to Lichtenstein's mesh technique in terms of recurrence of hernia and post-operative morbidity. Desarda's group showed improved results when compared to Lichtenstein group in terms of immediate postoperative pain, inguinodynia, surgical site infections, hospital stay duration and the time taken to return to normal life activities. Desarda's no mesh procedure may be considered as a substitute to

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Lichtenstein's mesh repair to avoid long-term mesh-related morbidity for uncomplicated inguinal hernias.

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## Introduction:-

Inguinal hernias remain an important surgical problem. The estimated existence threat for developing inguinal hernia is 27% for men and 3% for women. The yearly mortality ranges from 100- to 300 per 1,00,000 inguinal hernia cases<sup>[1]</sup>. In the European Hernia Society Guidelines(EHS), mesh-related procedures, Lichtenstein's procedure, in particular, is recommended for the treatment of characteristic primary inguinal hernia<sup>[2]</sup>. Mesh works as a mechanical support, but it doesn't give a mobile physiologically dynamic posterior wall<sup>[3]</sup>. Synthetic prostheses can produce new clinical problems, similar as foreign body sensation in the groin, discomfort, and abdominal wall stiffness, which may affect the case's everyday functioning. Surgical wound infections are more frequent after mesh-used hernia repairs<sup>[4]</sup>. Foreign body response around the mesh prosthesis may lead to chronic inflammation which may produce meshoma, the treatment of which becomes a new surgical challenge<sup>[5]</sup> also, prolonged scarring due to mesh may lead to vas deferens inhibition, leading to lower fertility rates and a dysejaculation syndrome. A study by Cocuzza et al. observed prosthetic mesh leads to long-term detrimental consequence on the vas deferens, causing azoospermia<sup>[6]</sup>. Due to the observed complications and postoperative dysfunctions, numerous investigators took to new hernia surgery techniques.

Desarda's method, presented in 2001, is a new hernia surgical procedure grounded on the conception of furnishing a strong mobile, physiologically active, and dynamic posterior wall<sup>[7]</sup>. Desarda argued that since the aging process is minimum in tendons and aponeurosis, the use of a strip of external oblique aponeurosis (EOA) is a good substitute to either mesh or the Shouldice's technique. The author demonstrated that his technique was dynamic in nature due to the condensation of the external and internal oblique muscles, thereby converting the strip of EOA into a 'shield' to avert re-herniation. He also showed that the strip of EOA supported the transversalis fascia and that chances of herniation behind the strip were also reduced<sup>[7]</sup>.

## Materials And Methods:-

All cases having uncomplicated inguinal hernia diagnosed clinically and by radiological examination were included in the study. Over a Period of 12 Months, 50 cases progressed between the age of 21 & 60 years treated for inguinal hernia were included in this prospective randomized study. Cases were aimlessly divided into two equal groups. Group A (control group) were subordinated to Lichtenstein's mesh whereas Group B (study group) were subordinated to Desarda non mesh technique.

### Inclusion criteria:

1. Adult cases above the age of 21 years.
2. Cases with clinically proven inguinal hernia

### Exclusion criteria:

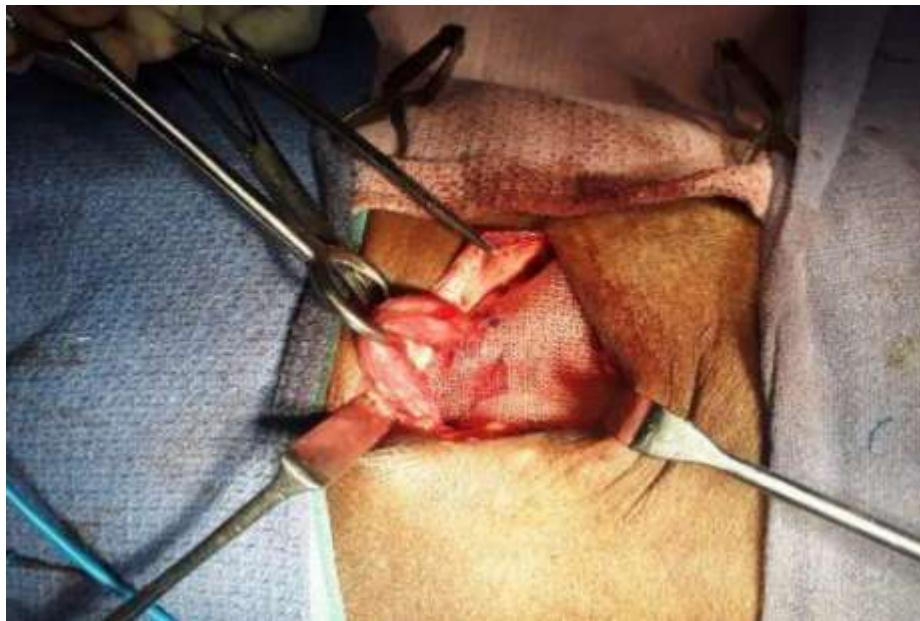
1. Cases over 60 years
2. Cases associated with recurrence of inguinal hernia
3. Cases with complicated inguinal hernia

## Procedure Details

### Lichtenstein's procedure (group A)

The technique was performed as described in the literature<sup>[8]</sup>, under spinal anaesthesia case in supine position, the oblique incision is made over the distance from the internal to the external ring which in proposition allows for the lowest length of incision required, which is about 5 to 7 cm incision parallel and 1 cm superior to the oblique line from ASIS to pubic tubercle which begins medially 2 cm side to the pubic tubercle in the anterior abdominal wall, after opening the layers of abdominal wall which are external oblique aponeurosis, inguinal canal is opened. Spermatic cord is separated, external spermatic fascia, Cremasteric fascia, internal spermatic fascia opened, sac visualised, type of hernia is verified. The sac of direct hernia is reduced and suture plication of transversalis fascia is done, and sac of indirect hernia is opened, any contents reduced. The sac is stitched closed at its neck and excess sac removed. Medial defect is closed, a piece of polypropylene mesh, measuring 8x15 cm is placed over the posterior

wall, behind the spermatic cord at the deep inguinal ring(as shown in figure 1), loose sutures hold the mesh to the inguinal ligament and conjoint tendon, external oblique closed with 2-0 polyglactin also subcutaneous and skin are closed.



**Figure 1:-** showing mesh placed over posterior wall.

#### **Desarda's repair (group B)**

This technique was performed as described in the literature<sup>[8,9,10]</sup>. After taking an oblique inguinal incision, skin and subcutaneous tissue were dissected to reach the external oblique aponeurosis layer. The external oblique aponeurosis was incised in line with the upper part of the superficial ring, which left the thinned-out portion in the lower flap, so a good strip of tissue can be taken from the upper flap. The sac was excised in all cases except in small direct hernias where it was inverted. The superior flap of the external oblique aponeurosis was sutured with the inguinal ligament from the pubic tubercle to the internal ring using 1-0 monofilament polyamide or polypropylene interrupted sutures (as shown in figure 2). The first two sutures were taken in the anterior rectus sheath where it joined the external oblique aponeurosis. The last suture was taken so as to constrict the deep ring adequately without tightening the spermatic cord. Each bite was elapsed first through the inguinal ligament, then the transversalis fascia, and then the external oblique.

A splitting incision was made in this sutured superior flap, partially dissecting a strip with a width equivalent to the gap between the muscle arch and the inguinal ligament but not more than 2 cm. This splitting incision was extended medially up to the pubic symphysis and laterally 1–2 cm beyond the abdominal ring. The medial insertion and lateral continuation of this strip were kept intact. A strip of the external oblique, was then available, the lower border of which was already sutured to the inguinal ligament. The superior free margin of the strip was then approximated to the internal oblique or conjoint muscle lying close to it with 1-0 monofilament polyamide or polypropylene interrupted sutures along its length (as shown in figure 3). This would ensure in the strip of the external oblique is put behind the spermatic cord to shape a novel posterior wall of the inguinal canal. The spermatic cord was put back in the inguinal canal and the inferior flap of the external oblique was sutured to the newly formed medial flap of the external oblique in front of the cord. The first stitch was taken between the lateral margin of the splitting incision and the inferior flap of the external oblique (as shown in figure 4). Then all the layers were closed using appropriate suture materials.



**Figure 2:-** Showing Strip of the EOA – lower border sutured to the inguinal ligament.



**Figure 3:-** Showing Strip of the EOA – upper border sutured to the internal oblique or conjoined muscle.



**Figure 4:-** Showing newly formed EOA.

### Statistical Analysis

Descriptive statistics were done for all data and suitable statistical tests of comparison were done. Continuous variables were analyzed with the Unpaired test and categorical variables were analyzed with Fisher Exact Test. Statistical significance was taken as  $P < 0.05$ . The data was analyzed using SPSS Version 16.

### Results:-

A total of 50 patients were included in this study. Each arm of the study had 25 patients, and the demographic characteristics of the two groups were comparable. The mean age of patients in group A was 29 years, and in group B was 28 years.

**Table 1:-** Demographic details.

|          | LICHTENSTEIN (N=25) | DESARDA (N=25) |
|----------|---------------------|----------------|
| MEAN AGE | 29                  | 28             |
| MALE SEX | 25(100%)            | 25(100%)       |
| HERNIA   |                     |                |
| DIRECT   | 5(20%)              | 4(16%)         |
| INDIRECT | 20(80%)             | 21(84%)        |
| SITE     |                     |                |
| LEFT     | 9(36%)              | 11(44%)        |
| RIGHT    | 16(64%)             | 14(56%)        |

**Table 2:-** Duration of hospital stay.

| DURATION       | LICHTENSTEIN (N=25) | DESARDA (N=25) |
|----------------|---------------------|----------------|
| SHORT(<4 DAYS) | 16                  | 21             |
| LONG(>4 DAYS)  | 9                   | 4              |

Mean hospital stay for Desarda's group was less than 4 days, for Lichtenstein group was more than 4 days ( $p$ -value<0.0001)

**Table 3:-** Post-operative pain:

| POST-OPERATIVE PAIN | LICHTENSTEIN (N=25) | DESARDA (N=25) |
|---------------------|---------------------|----------------|
| FIRST POD           | 22                  | 18             |
| THIRD POD           | 23                  | 15             |
| FIFTH POD           | 21                  | 12             |

Analysis of post-operative pain was done using visual analogue scale and mild to moderate severity pain was noted on 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> post-operative day, which was significantly less in Desarda's group as compare to Lichtenstein group ( $P$  value <0.0001)

**Table 4:-** Complications.

| COMPLICATIONS      | LICHTENSTEIN (N=25) | DESARDA (N=25) |
|--------------------|---------------------|----------------|
| SEROMA             | 3                   | 1              |
| WOUND INFECTION    | 6                   | 2              |
| HAEMATOMA          | 3                   | 1              |
| TESTICULAR ATROPHY | 0                   | 0              |
| RECURRENCE         | 0                   | 0              |

There is no recurrence between both groups, complications are more for Lichtenstein group then Desarda group ( $p$  value <0.0001). There were no case of chronic groin pain lasting more than 3 months in either of the group.

### Discussion:-

Lichtenstein mesh technique is now extensively used, and is frequently appertained to as the gold standard despite a fairly deficit of clinical trial comparing mesh with tissue repair technique. Cost of surgery<sup>[12]</sup> and post-operative morbidity affecting the quality of life are important consideration in the inguinal hernia surgery. There are no clear scientific substantiation to ameliorate to prove that the mesh prosthesis technique is superior to non-prosthesis technique in this respect<sup>[12]</sup>.

There are advantages and disadvantages associated with all types of open inguinal hernia surgery. Current non prosthesis repair (Bassini or Shouldice) is criticized for causing tension in the tissue and mesh repair is criticized for causing complication of foreign body. Desarda's technique uses an undetached strip of external oblique aponeurosis between the muscle layer and inguinal ligament to give a strong and physiologically dynamic posterior wall<sup>[11]</sup>.

The posterior wall of the inguinal canal was weak and without dynamic movement in all cases. Strong aponeurotic extensions were absent in the posterior wall. The muscle layer movement was lost or lowered in all cases. The movement of the muscle layer refined after it was stitched to the upper border of a strip of the external oblique aponeurosis (EOA). The revised posterior wall was kept physiologically dynamic by the new and refined muscle strength supplied by external oblique muscle to the weakened muscles of the muscle layer. A physiologically dynamic and strong posterior inguinal wall, and the shielding and contraction action of the muscles and aponeurosis around the inguinal canal are important factors that inhibit hernia development or hernia recrudescence after repair. In addition, the squeezing and plugging action of the cremasteric muscle and binding effect of the strong cremasteric fascia, also play an important part in the precluding of hernia<sup>[9,10,11]</sup>. Desarda's result in a tension free repair without the use of any foreign body, being simple to perform.

For inguinal hernia surgeries, different studies have tried to give an answer as to which of the current methodology is better. <sup>[13]</sup>THE EU HERNIA COLLABRATION made a systemic modification of the randomized prospective studies and analysis of the result of different studies.

The use of synthetic mesh mainly reduces the threat of hernia recrudescence irrespective of placement technique. Mesh technique appears to reduce the chance of persisting pain rather than increase it as suggested in studies conducted by McGillicuddy JE et al<sup>[14]</sup>.

MP Desarda et al<sup>[9,10,11]</sup> reported no case had severe pain postoperatively and nearly all cases (n = 396) were free of pain and discomfort after the alternate postoperative day. 340 cases (85) were discharged by the 4th postoperative day, and utmost returned to normal conditioning within 2 weeks. There was 1 early Haematocoele, and 1 recrudescence at 2 years<sup>[9,10,11]</sup>. In this study Return to normal nonstrenuous conditioning After 7- 15 days in Desarda group was 84 while only 48 cases in Lichtenstein form. (p value < 0.0001).

In studies conducted by Mitura K, Romanczuk M et al<sup>[15]</sup>, after Desarda technique there was lower acute postoperative pain, rated in VAS scale at 3.3 in first day after the surgery 2.1 in 2nd day and 1.5 in third one, and in group II rated at 3.8, 2.7 and 1.6 respectively. Cases after Desarda technique were discharged on fourth day after the surgery, in group II on fifth postoperative day (p < 0.05). One week after the hernia operation cases in both groups equivalently classified the intensity of the pain (VAS 1.2). Six months after the hospitalization the effect of performed surgery was described as good or really good. Only one case in group I was unsatisfied with the surgery results. There was minor intensity of the pain at this point—resembling in both groups (I--0.8, II--1.1). Full exertion was achieved by 46 patients in group I and 45 in group II. There was no hernia recrudescence among the cases six months after the surgery. In This study mild to moderate pain only noticed mild to moderate on 1st, 3rd and 5th post-operative days was significantly less in Desarda's group as compare to Lichtenstein group (P value < 0.0001).

The external oblique muscle method satisfies all criteria of current hernia surgery. Desarda's methodology is simple and easy to do. It doesn't challenge dangerous or complicated deconstruction. There's no strain in suture line. It doesn't demand any foreign material and doesn't use weak muscle or fascia transversalis for repair. It doesn't use mesh prosthesis so it's further provident and also avoid morbidity associated with foreign body like rejection, infection, long standing groin pain.

Szopinski et al<sup>[16]</sup>, stated in their Randomized controlled trial that the Desarda's methodology has the implicit to enlarge the number of tissue predicated technique available to treat groin hernias. The most apparent suggestion for use monetary constraints or if a case differ with the use of mesh.

### Conclusion:-

Desarda technique was established to be superior in terms of lower post-operative pain scores, lower analgesic demand, shorter hospital stay and early return to preoperative functional status. Use of Desarda technique avoids

mesh related complications like mesh infection, heaviness in the groin and foreign body sensation. Desarda technique is much further provident than Lichtenstein technique.

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