International Surgery Journal
*Prakash et al. Int Surg J. 2018 Sep;5(9):3139-3145*
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20183737

**Original Research Article**

# Comparative study of open mesh repair and Desarda's no-mesh repair for inguinal hernia, in GMKMCH, Salem, India

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**Received:** 23 June 2018
**Accepted:** 23 July 2018

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## ABSTRACT

**Background:** Mesh repair has gained popularity among the surgical repair of hernias but has limitations. This study is being carried out to compare the effectiveness of Desarda's no mesh repair, with Lichtenstein's tension free repair.
**Methods:** This prospective study was carried out in GMKMCH, Salem, over a period of 2 years. A total of 60 cases with inguinal hernia were included in the study. 30 patients were randomly subjected to Desarda's technique and 30 patients underwent Lichtenstein's repair. After surgery, patients were followed up and noted for complications like groin pain, surgical site infections, duration of hospital stay, duration to return to normal activity.
**Results:** Operative time was 45 minutes in Desarda's group and 50 minutes in the Lichtenstein group which was highly significant ($p<0.01$). On 2-year follow-up there were no recurrences in both groups. There were no surgical site infections in the Desarda's group, compared to whereas Lichtenstein's repair where had 4 (10%) recurrences. The occurrence of complications like loss of sensation over the groin, scrotal edema, abdominal wall stiffness was not seen in Desarda's group, whereas its occurrence was highly significant ($p<.01$) in Lichtenstein's group.
**Conclusions:** Desarda's no mesh technique is easy to learn and simple when compared to other no mesh repair techniques and requires no mesh. It can be used in a contaminated surgical field, in young individuals and in cases of financial constraints. Hence, Desarda's no mesh repair is favourably comparable with Lichtenstein's mesh repair.

**Keywords:** Desarda, Inguinal hernia, Mesh repair

## INTRODUCTION

A hernia is defined as protrusion of whole or a part of a viscus through the wall that contains it.[1] It is the most commonly seen condition in the outpatient department in most parts of the world. Improvements in surgical technique and a better understanding of the anatomy and physiology of the inguinal canal have significantly improved outcomes for many patients.[2]

Inguinal hernia repair may be done by open techniques, which includes tissue repair (Shouldice repair, Mcvay repair, Bassini's Repair) and Prosthetic repairs (Lichtensteins's tension free repair, plug and patch technique, prolene hernia system, Stoppa's technique). It can also be done by laparoscopic methods (Trans Abdominal Pre-Peritoneal repair, Totally Extra Peritoneal Repair, Intraperitoneal On lay mesh repair)

The choice of a method depends on the surgeon; however, the ideal method for modern hernia surgery should be simple, cost effective, safe, tension free and permanent.[3]

Despite the various modalities available for treatment of this common condition, no surgeon has ideal results. Complications like postoperative pain, nerve injury, infection, and recurrence continue to pose a challenge.

This necessitates the introduction of a new technique of hernia repair with reduced complication rates.

The Desarda's technique of inguinal hernia repair is an improvement as it overcomes the challenges faced with the use of the tension tissue-repair and mesh repair techniques. It is based on the concept of providing a strong, tension-free and physiologically dynamic posterior inguinal wall.[4]

This study visualizes two modalities of hernia repair:

- The Lichtenstein tension free repair,
- The Desarda's no mesh technique

and compares the efficacy and complication rates associate with them.

***Desarda's no mesh repair***

- This is a relatively new method which is based on the concept of providing a strong, mobile and physiologically active posterior abdominal wall.[5]
- This method was introduced by Dr. Mohan P. Desarda at Poona Hospital and Research Centre, Pune.

The external oblique aponeurosis (EOA) is cut, the inguinal canal is opened.

Intra-OP pictures:

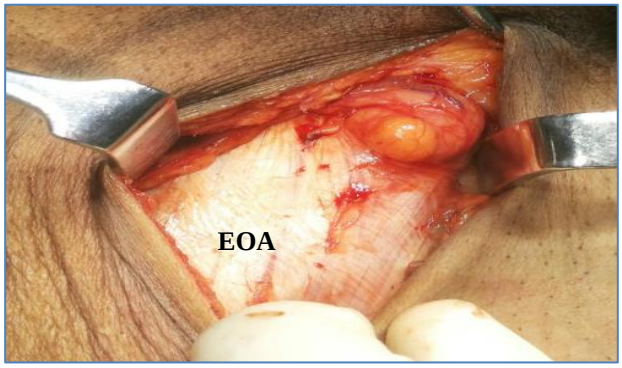



**Figure 1: External oblique visualized.**

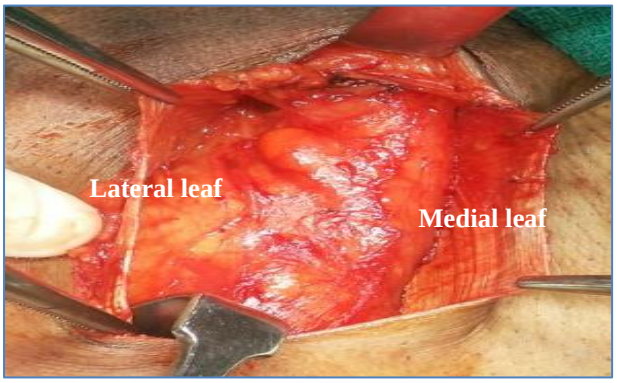



**Figure 2: External oblique split into two leaves.**

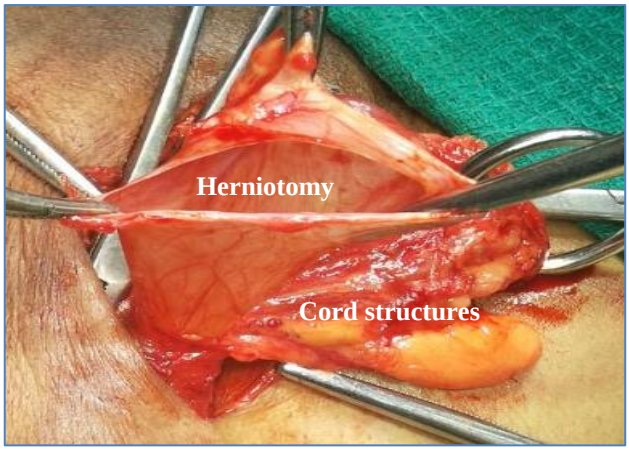



**Figure 3: Herniotomy done and cord structures lateralized.**

Herniotomy is done.

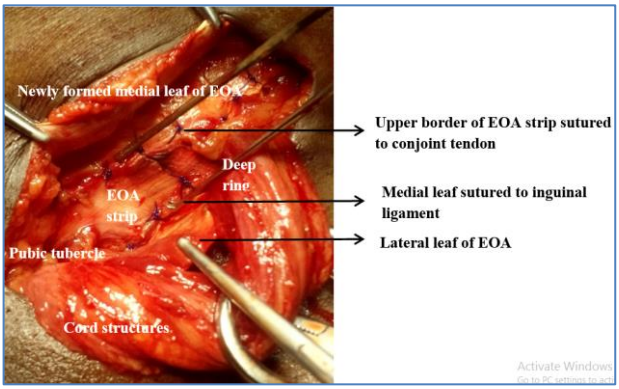



**Figure 4: Desarda's repair.**


**Figure 5: Desarda's repair-final appearance.**

The medial leaf of the EOA is sutured to the inguinal ligament from the pubic tubercle to the deep ring. Sutures are taken to narrow the deep ring, but care should be taken not to constrict the spermatic cord. A splitting

incision is made in the sutured medial leaf and is extended medially up to the rectus sheath and laterally 1-2 cm beyond the deep ring. The medial insertion and lateral continuation of this strip is kept intact through which it gets its blood supply. The upper free border of the strip is sutured to the conjoint tendon with 2/0 polypropylene interrupted sutures. The strip of EOA is placed behind the cord to form a new posterior wall of the inguinal canal. The lateral leaf of the EOA is sutured to the newly formed medial leaf of the EOA in front of the cord.

Undermining of the newly formed medial leaf on both of its surfaces helps in approximation to the lateral leaf without tension. This is followed by closure of the superficial fascia and the skin as usual.

***Mechanism of action***

External oblique muscle contraction produces a lateral tension in the strip, whereas internal oblique/conjoined muscle contraction results in a superolateral tension, hence making the strip like a shield which prevents herniation.

Hence when there is a strong intra-abdominal blow, there is a strong intra-abdominal contraction. This gets translated into an increased tension in the External Oblique aponeurosis strip which protects from herniation

Advantages are no suture line tension, no foreign material, simple and easy to do and learn.[5]

## METHODS

The study population consists of patients presenting with inguinal hernia at the General surgery outpatient department, in Government Mohan Kumaramangalam Medical College Hospital, Salem. It was a prospective study conducted for 2 years (January 2014 to January 2016).

***Inclusion criteria***

All patients who present in surgical outpatient department with inguinal hernia.

***Exclusion criteria***

- Associated surgical pathologies where the patient was getting operated for both conditions at the same time, laparoscopic repairs or the patients given general anesthesia for any reason.
- Old age with thinned out external oblique aponeurosis.
- Pregnancy.
- Children.
- Morbid obesity.
- Bilateral/ recurrent/ complicated inguinal hernia.

Patients were randomly subjected to Lichtenstein's tension free mesh repair and Desarda's no mesh technique after obtaining informed consent. All patients were treated with antibiotics and analgesics postoperatively.

Sample size: Among the 60 patients who were diagnosed with inguinal hernia, they were divided into 2 groups:

Group I : 30 patients were subjected to Desarda's no mesh repair
Group II: 30 patients were subjected to Lichtenstein's tension free mesh repair.

Follow-up: Patients were followed up till discharge, following which they were followed up after 2 weeks, 1 month, 2 months, 6 months, 1 year and 2 year.

## RESULTS

A total of 60 patients who presented in the outpatient department of General Surgery, with a diagnosis of inguinal hernia during the study period were enrolled in the study. The subjects were thoroughly examined and subjected randomly to Desarda's no mesh technique and Lichtenstein's tension free mesh repair

The outcome of each procedure was assessed during follow up. This was summarized into a master chart. The collected data was analysed with SPSS 16.0 version.

To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean and S.D were used for continuous variables. To find the significant difference between the bivariate samples in independent groups (male and female) unpaired sample t-test was used. To find the significance in categorical data Chi-Square test was used. In both the above statistical tools the probability value .05 is considered as significant level. The comparable tabulations permit certain statistical interferences to be made which are presented below.

***Age incidence***

The age of the patients varied from 20 to 60 years. Most of the patients belonged to more than 55 years of age. The following table shows the age distribution in the study group.

**Table 1: Distribution of cases in different age groups.**

| Age in years | Frequency | Percent |
|---|---|---|
| Up to 25 | 5 | 8.3 |
| 26-35 | 7 | 11.7 |
| 36-45 | 8 | 13.3 |
| 46-55 | 15 | 25 |
| > 55 | 25 | 41.7 |
| Total | 60 | 100 |

P: 0.835

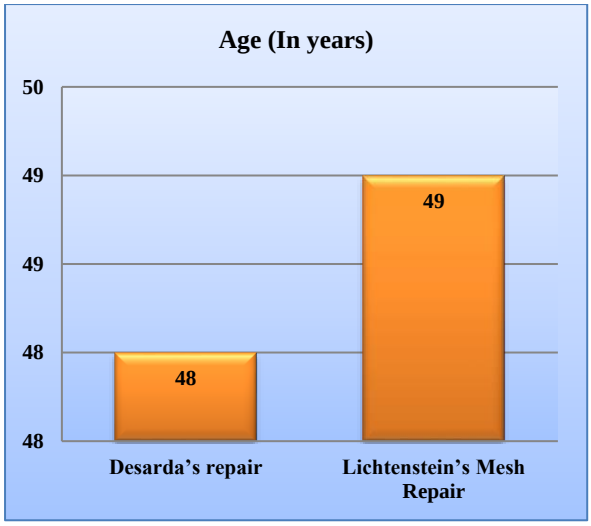



**Figure 6: Age distribution in each study group.**

***Duration of hernia***

The average duration of the hernia in the group of patients who underwent Desarda's repair was 7 months, whereas in those who underwent Lichensteins mesh repair it was 11 months.

**Table 2: Duration of the disease.**

| | Disease duration |
|---|---|
| Desarda's repair | 7 months |
| Lichtenstein's mesh repair | 11 months |

P: 0.000 (highly significant)

***Type of hernia***

Of the 30 patients who underwent Desarda's repair (DR), 10 (33.3%) patients had direct hernia and 20 (66.7%) patients had indirect hernia. Of the 30 patients who underwent Lichenstein's mesh repair (LMR), 11 (36.7%) patients had direct hernia (D) and 19 (63.3%) patients had indirect hernia (id).

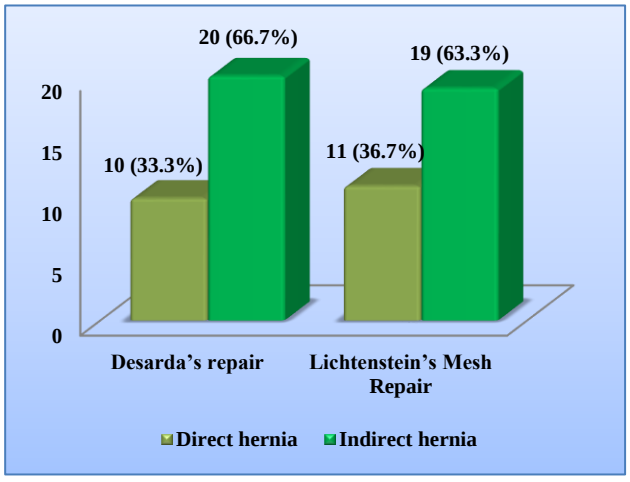



**Figure 7: Type of hernia in each group.**

***Intra-operative parameters***

***Type of anaesthesia***

Out of the 30 patients in the Desarda's group, 5 (16.7%) patients had surgery under Local Anaesthesia, whereas the rest under regional anaesthesia.

Out of the 30 patients in the Lichensteins group, 3 (10%) had surgery under Local anaesthesia (LA), and the rest under Regional anaesthesia (RA).

***Duration of surgery***

The average duration for Desarda's No mesh repair was 45minutes. The average duration for Lichtenstein's mesh repair was 50minutes. P: 0.000 (highly significant).

***Postoperative parameters***

***Groin pain***

Patients from both groups were followed up, and those who had groin pain were noted and the data was tabulated.

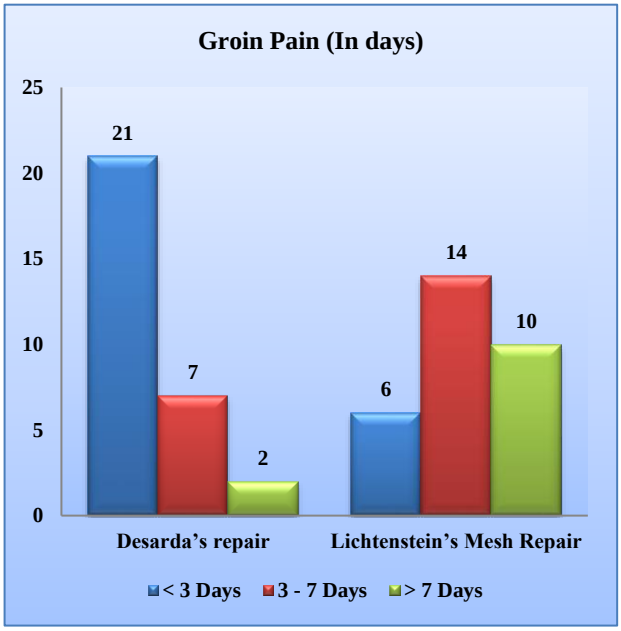
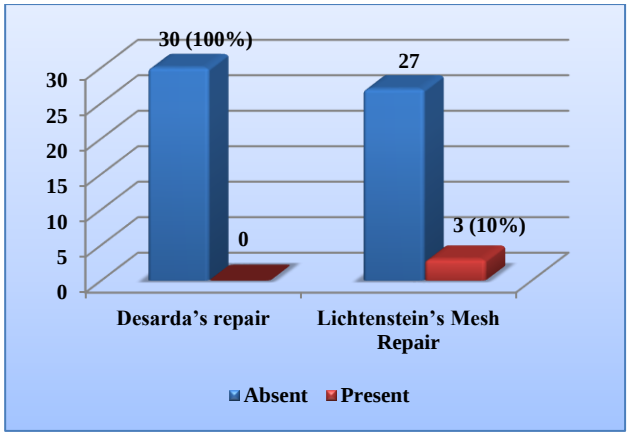



**Figure 8: Incidence of groin hernia in each group.**

***Surgical site infections (SSI)***

During the postoperative period patients who had surgical site infections were identified and graded as grade I according to CDC classification and the results were tabulated.

None of the patients in the Desarda group had surgical site infections, whereas 3 patients (10%) had surgical site infections in the Lichtenstein group.

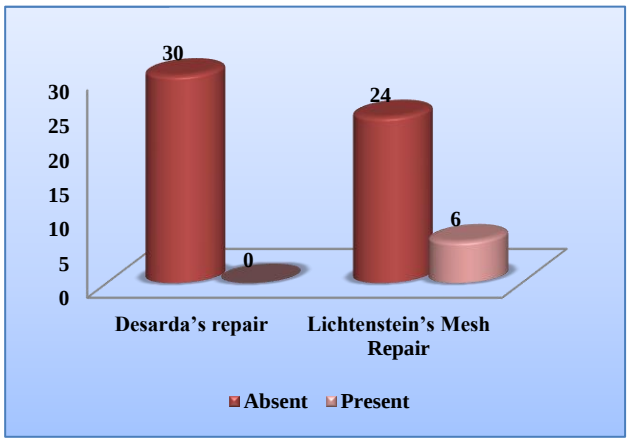



P: 0.076

**Figure 9: Incidence of surgical site infection in each group.**

***Foreign body sensation (FBS)***

Of the 30 patients who underwent hernia repair by Lichtenstein's technique, 6 (20%) patients complained of foreign body sensation, compared to Desarda's technique where there were no such incidence.




P: 010

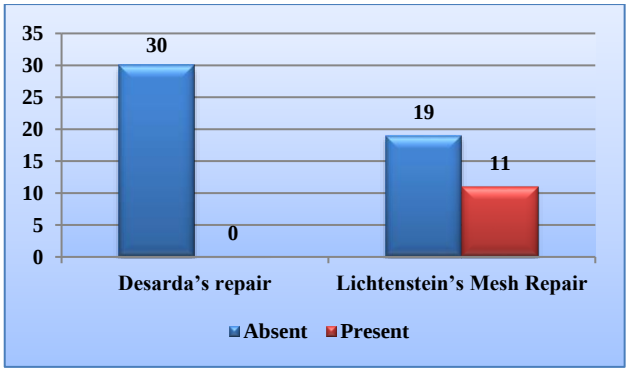
**Figure 10: Incidence of foreign body sensation in each group.**

***Abdominal wall stiffness (AWS)***

Of the 30 patients who underwent Desarda's inguinal hernia repair, none of the patient had abdominal wall stiffness. Of the 30 patients who underwent Lichtenstein's mesh repair, 7 (23%) had complaints of abdominal wall stiffness. This was statistically highly significant.

***Loss of sensation (LOS) over the groin***

The number of patients who had loss of sensation over the abdominal wall were noted and the results were tabulated.




P: 0.000

**Figure 11: Incidence of loss of sensation over groin in each group.**

***Scrotal edema (SE)/ Testicular atrophy (TA)***

None of the patients who underwent Desarda's repair had scrotal edema or testicular atrophy. 6 (20%) patients in the Lichtenstein's mesh repair group had scrotal edema, and 1 (3.3%) patient had testicular atrophy. The P value was highly significant

***Seroma (S)/ Hematoma (H)***

None of the patients in the Desarda's repair group had seroma/hematoma. 1 patient (3.3%) in the Lichtenstein mesh repair had hematoma, whereas 4 patients (13.3%) had seroma. P: 0.065.

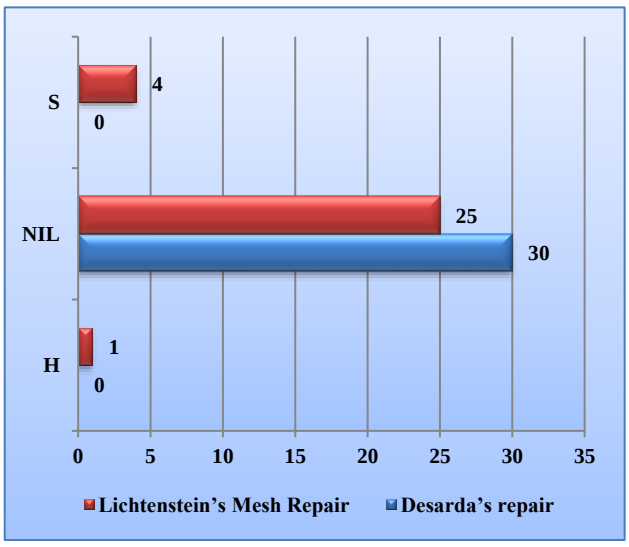



**Figure 12: Incidence of seroma/ hematoma in each group.**

***Duration of hospital stay***

The average duration of hospital stay was 4 days in case of Desarda's repair and 6 days in Lichtenstein's repair with a P value of 0.000 (highly significant).

***Return to normal activity (RTNA)***

In Desarda's group, the duration to return to normal activity was <7 days in 19(63.3%) patients, 7-15 days in 8(26.7%) patients, >15 days in 3(10%) patients. In Lichtenstein's group, the duration of return to normal activity was <7 days in 3(10%) patients, 7-15 days in 18(60%) patients, >15 days in 9(30%) patients. The p value was highly significant (0.000).

***Recurrences***

There were no recurrences in both the groups during a two year follow up.

## DISCUSSION

Inguinal hernia is a very common condition afflicting mankind.[5] A physiologically weak posterior inguinal canal wall is the main cause of inguinal hernia in most of the patients. Hence the main goal of hernia repair should be focused at providing a strong, mobile and physiologically active posterior wall of the inguinal canal.[6]

Mesh repair is now commonly used and is most often referred to as the gold standard technique.[10] But this surgery is associated with more complications like chronic groin pain, seroma, testicular atrophy etc., mostly in the hands of less experienced junior consultants. Mesh is also costly and is not available in many parts of the world. Though mesh acts like a mechanical barrier, it does not provide a mobile and dynamic posterior wall.[5]

Standard tissue repairs like Shouldice, Bassini also require expertise and are associated with tension in the repaired tissue.[6] Hence this study compares Desarda technique which is a relatively simple tissue repair, does not require a foreign body like mesh, cost effective, with minimal complications, with Lichtenstein's tension free mesh repair.[6] This method satisfies the rule of 'No tension' that is used in Lichtenstein's mesh repair, as well as provides a physiologically sound, dynamic posterior wall of inguinal canal.[7]

As the aging process is minimum in the tendons and aponeurosis, a strip of the external oblique, which is tendo-aponeurotic, is the best alternative to the mesh, which is used in Desarda's technique.[5]

In this study, incidence of inguinal hernia was highest in the 4$^{th}$ decade with a mean age of 48. The average duration of hernia in Desarda's technique was 7 months whereas in Lichtenstein's technique it was 11 months.

Various studies show that Desarda's technique is associated with lesser duration of surgery, and lesser post op complications like groin pain, abdominal wall stiffness, duration of hospital stay and time to return to normal activity.[4,6-8]

In this study, the average duration for Desarda's no mesh repair was 49 minutes, whereas the average duration for Lichtenstein's mesh repair was 54 minutes.

Groin pain has been found to be due to fibrous reaction to foreign body in case of mesh repair, leading to spermatic cord and nerve enmeshment, which affects the quality of life of the patient.[5] Desarda's technique being a pure tissue repair, and hence no fibrous reaction to produce groin pain. In present study, patients were classified into those who had groin pain for <3 days, 3-7 days, >7 days. 70% of the patients in the Desarda group experienced pain only for less than 3 days whereas 46.7% and 33.3% of the patients in Lichtenstein's method had pain for 3-7days and more than 7 days respectively.

Surgical site infection was higher in Mesh repair (10%) when compared to Desarda's technique (0%). Foreign body sensation and loss of sensation was present only in Lichtenstein's mesh repair group.

According to Desarda et al, the average duration that was needed for the patients to return to work in the Desarda group was 8.26 days whereas it was 12.58 days in the Lichtenstein group.[10] In present study most of the people (63.3%) in the Desarda's group returned to normal activity within 7 days, when compared to Lichtenstein's group where the patients (60%) returned to normal activity within 7-15 days.[11]

Desarda et al showed a recurrence of 1.97%, but it was observed during a 10-year follow-up. But in this study both the groups had no recurrences during 2-year follow-up which indicates the necessity for a large scale and long-term follow-up to identify recurrences if any.

## CONCLUSION

Desarda's no mesh technique is easy to learn and simple when compared to other no mesh repair techniques and requires no mesh. It is physiologically sound. It can be performed under local anesthesia when patient is unfit for regional/ general anesthesia. It is associated with less duration of surgery, less mesh related complications in the postoperative period and rapid recovery. It can be used in a contaminated surgical field, in young individuals and in cases of financial constraints.

Hence, Desarda's no mesh repair is favorably comparable with Lichtenstein's mesh repair. To conclude Desarda's no mesh repair, when compared to Lichtenstein's mesh repair produces same or better results. Large scale and Long term follow up may be required to identify the recurrent cases if any.

## ACKNOWLEDGEMENTS

Authors are deeply indebted to Dr. C. Rajasekaran, Professor and Head, Department of General Surgery, Government Mohan Kumaramangalam Medical College

Hospital, for his fathomless enthusiasm and motivation throughout the study. Authors would like to acknowledge Mr. S. Venkatesan, for helping to analyze and compile the statistical data for study.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Prakash, Mohan PB. Comparative study of open mesh repair and Desarda's no-mesh repair for inguinal hernia, in GMKMCH, Salem, India. Int Surg J 2018;5:3139-45.