



COMPARATIVE STUDY OF OPEN DESARDA'S NO-MESH REPAIR AND OPEN MESH REPAIR FOR INGUINAL HERNIA

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ABSTRACT

Inguinal hernia is the most common among the hernias. The best treatment modality of it is primarily surgical. Improvements in surgical techniques of inguinal hernia repair have significantly improved the outcomes for patients. The success rate of hernia surgeries is mostly noted by its permanence, amount of complications, cost effectiveness, and duration to return to normal activity. Though mesh repair has gained popularity among the surgical repair of hernias, it has certain limitations like availability of mesh, cost, learning curve and complications associated with it. Hence this study is being carried out to compare the effectiveness of Desarda's no mesh repair, a newer cost effective method, with the existing Lichtenstein's tension free repair, and to decide on a better treatment for inguinal hernia repair based on the results of this study. A total of one hundred and twenty patients were included in the study. These patients were grouped into group A (Desarda's repair group) and group B (Lichtenstein repair group) and randomization was done. Results of these two techniques were compared with respect to groin pain, surgical site infections, duration of hospital stay, duration to return to normal activity. There was no significant differences regarding age, sex, type of hernia, duration of hernia in both the groups. The operation time was 49 minutes in Desarda's group and 54 minutes in the Lichtenstein group which was considered highly significant. Over a period of two year follow-up there were no recurrences in both the groups. There were no surgical site infections in the Desarda's group when compared to Lichtenstein's repair. The occurrences of other complications like Loss of sensation over the groin, Scrotal edema, abdominal wall stiffness were not seen in Desarda's group, whereas its occurrence was highly significant in Lichtenstein's group. The mean hospital stay was 4 days in Desarda's group while it was 6 days in the Lichtenstein group in those patients who were hospitalized. The current study showed that Desarda's technique is easy to learn and simple method when compared to other tissue repair techniques and requires no mesh. It can be performed under local anesthesia when patient is unfit for Regional/General anesthesia and is associated with a less duration of surgery and less mesh associated postoperative complications, with a rapid recovery time.

KEYWORDS : Inguinal hernia, Desarda's repair, Mesh hernioplasty, Infection.

INTRODUCTION

A hernia is defined as protrusion of whole or a part of a viscus through the wall that contains it⁽¹⁾. It is an area of weakness or complete disruption of fibromuscular tissues of the body wall, through which structures arising from the cavity contained by the body wall can pass through or herniate⁽³⁾ Inguinal hernia 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⁾

The various surgical techniques of inguinal hernia repair are **Open techniques:** Tissue repairs-Shouldice repair, Mcvay repair, Bassini's repair. **Prosthetic repairs-** Lichtenstein's tension free repair, Plug and patch technique, Prolene hernia system, Stoppa's technique. **Laparoscopic approach:** Transabdominal Preperitoneal repair (TAPP), Totally extraperitoneal repair (TEP), Intraperitoneal onlay mesh repair (IPOM).

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⁽¹²⁾. 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 to surgeons.

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⁽¹⁰⁾.

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.

AIM OF THE STUDY

To compare the efficacy of Desarda's no mesh repair over Lichtenstein repair for the treatment of inguinal hernia, complications associated with both the modalities of treatment and to decide on the better treatment for inguinal hernia based on the findings of the study.

PATIENTS AND METHODS

The current study was conducted in the department of general surgery at Narayana medical college & Hospital Nellore, Andhra Pradesh, India, between September 2020 to January 2023.

Study Design:

Prospective study.

Inclusion Criteria:

All patients who present in surgical outpatient department with inguinal hernia: Direct, Indirect, Pantaloon.

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.

Sample Size:

Among the 120 patients who were diagnosed with inguinal hernia, they were divided into 2 groups

Group I :60 patients were subjected to Desarda's no mesh repair Group II :60 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 2year

Techniques:

Anaesthesia: - both the procedures were performed under local, regional (spinal / epidural) or general anaesthesia.

Operative Technique:

a) Common to both procedures includes: -Skin incision, exposure and incision of the external oblique aponeurosis (EOA), dealing with contents of the sac depending on their clinical status. Closure of superficial fascia and skin incision.

Procedure Specific To Each Group:

Group A: Desarda's technique (described by Desarda) with minor modifications for study purpose:

- Lower border of the upper leaf of EOA was sutured to the inguinal ligament behind the spermatic cord starting from the pubic tubercle to the internal ring with continuous sutures using 2o proline. A splitting incision was made in the upper leaf of EOA separating a strip of 1.5 cm width (1-2cm) keeping the medial insertion and lateral continuity intact. Upper border of this strip was sutured to the conjoined tendon, wherever tendon was not available it was sutured to internal oblique or conjoined muscles with polydioxanone suture (PDSII) to interrupted sutures. Now the spermatic cord lies on the newly created posterior wall by the strip of EOA. Upper border of the lower leaf of the EOA was sutured to the newly formed lower border of the upper leaf of the EOA anterior to spermatic cord, with 1o proline continuous sutures.

Group B: Mesh hernioplasty: -

one longitudinal margin of the polypropylene mesh (15x7cm) was sutured to inguinal ligament with 2o proline, starting from the pubic tubercle to 2 cm lateral to the internal ring. Then the mesh was fashioned with a lateral slit of 2 cm to accommodate the cord and to fit on to posterior wall of inguinal canal. The two lateral tails of the mesh was sutured together lateral to the internal ring to create new deep ring tight enough but not constricting spermatic cord. Then mesh was fixed to posterior wall with 2o proline. EOA has been closed in front of the card.

RESULTS AND ANALYSIS

A total of 120 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 27 version.

To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & S.D were used for continuous variables.

To find the significant difference between the bivariate samples in Independent groups (Male & 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.

Comorbid Conditions:

| | | DRLMR | | Total | |
|--------------|---------------|-------------------------|-----------------------------------|---------|--------|
| | | Desard a's repair | Lichtenste in's Mesh Repair | | |
| Com orbid | COPD | Count | 4 | 4 | 8 |
| | | %within DRLMR | 6.70% | 6.70% | 6.70% |
| | DM | Count | 6 | 8 | 14 |
| | | %within DRLMR | 10.00% | 13.30% | 11.70% |
| | HTN | Count | 4 | 6 | 10 |
| | | %within DRLMR | 6.70% | 10.00% | 8.30% |
| | HTN/DM | Count | 0 | 2 | 2 |
| | | %within DRLMR | 0.00% | 3.30% | 1.70% |
| | HTN/P | Count | 0 | 2 | 2 |
| | | %within DRLMR | 0.00% | 3.30% | 1.70% |
| | NIL | Count | 38 | 32 | 70 |
| | | %within DRLMR | 63.30% | 53.30% | 58.30% |
| P | Count | 8 | 6 | 14 | |
| | %within DRLMR | 13.30% | 10.00% | 11.70% | |
| Total | Count | 60 | 60 | 120 | |
| | %within DRLMR | 100.00% | 100.00% | 100.00% | |

P: 0.840

Comorbidities like COPD, DM, Hypertension, and prostatomegaly were taken into consideration and the findings were tabulated and are as follows

Duration Of Surgery:

The average duration for Desarda's No mesh repair was 49minutes. The Average duration for Lichtensteins Mesh repair was 54minutes

| | Levene's Test for Equality of Variances | t-test for Equality of Means | | | | | | | | |
|---|---|------------------------------|------|---------|--------|----------------------------|---------------------------------|---------------------------------|--|-----------|
| | | F | Sig. | t | df | Sig. (2- tail ed) | Mea n Di ffer enc e | Std. Error Diffe rence | 95% Con fidence Inter val of the Dif ference | Low er |
| Durat ion of Surge ry (In minut es) | Equal variances assumed | 4.879 | .031 | -4.361 | 58 | .000 | -5.433 | 1.246 | -7.927 | -2.940 |
| | Equal variances not assumed | | | -4.3618 | 51.868 | .000 | -5.433 | 1.246 | -7.933 | -2.933 |

P: 0.000

Postoperative Parameters:

Groin Pain:

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

| | | DRLMR | | Total | |
|---------------|---------|---------------------|-------------------------------|-------|----|
| | | Desarda's repair | Lichtenstein's Mesh Repair | | |
| Groin pain | <3 Days | Count | 42 | 12 | 54 |

| | | | | | |
|-------|----------------|----------------|--------|--------|-------|
| | | % within DRLMR | 70.0% | 20.0% | 45.0% |
| | 3-7 Days | Count | 14 | 28 | 42 |
| | | % within DRLMR | 23.3% | 46.7% | 35.0% |
| | >7 Days | Count | 4 | 20 | 12 |
| | | % within DRLMR | 6.7% | 33.3% | 20.0% |
| Total | Count | 60 | 60 | 120 | |
| | % within DRLMR | 100.0% | 100.0% | 100.0% | |

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.

| | | | | | |
|-----|---------|---------------|------------------|----------------------------|-------|
| | | | DR | LMR | Total |
| | | | Desarda's repair | Lichtenstein's Mesh Repair | |
| SSI | Absent | Count | 60 | 54 | 114 |
| | | %within DRLMR | 100.0% | 90.0% | 95.0% |
| | Present | Count | 0 | 6 | 6 |
| | | %within DRLMR | 0.0% | 10.0% | 5.0% |

P: 0.076

Foreign Body Sensation(FBS):

Of the 60 patients who underwent hernia repair by Lichtenstein's technique, 12 (20%) patients complained of foreign body sensation, compared to Desarda's technique where there were no such incidences

| | | | | | |
|-----|---------|----------------|------------------|----------------------------|-------|
| | | | DR | LMR | Total |
| | | | Desarda's repair | Lichtenstein's Mesh Repair | |
| FBS | Absent | Count | 60 | 48 | 108 |
| | | % within DRLMR | 100.0% | 80.0% | 90.0% |
| | Present | Count | 0 | 12 | 12 |
| | | % within DRLMR | 0.0% | 20.0% | 10.0% |

P: 0.10

Seroma (S) / Hematoma (H):

None of the patients in the Desarda's repair group had seroma/hematoma 2 patient (3.3%) in the Lichtenstein mesh repair had hematoma, whereas 8 patients (13.3%) had seroma

| | | | | | |
|-------|---------------|--------|------------------|----------------------------|-------|
| | | | DR | LMR | Total |
| | | | Desarda's repair | Lichtenstein's Mesh Repair | |
| S/H/H | Count | 0 | 2 | 2 | |
| | %within DRLMR | 0.0% | 3.3% | 1.7% | |
| | Count | 60 | 50 | 110 | |
| | %within DRLMR | 100.0% | 83.3% | 91.7% | |
| S | Count | 0 | 8 | 8 | |
| | %within DRLMR | 0.0% | 13.3% | 6.7% | |

P: 0.065

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

| | | | | | | | | | | |
|---------------|--------------------------------|----------------------------|-------|----|-----------------|-----------------|-----------------------|---|--------|---|
| | Levene's Equality of Variances | Test for Equality of Means | | | | | | | | |
| | F | Sig. | t | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | | |
| | | | | | | | | Lower | Upper | |
| Hospital stay | Equal variances assumed | 1.325 | 0.254 | 58 | 0.617 | -1.707 | 0.340 | -2.382 | -1.019 | 2 |

| | | | | | | | | | | | |
|--|-----------------------------|--|--|--|--------|--------|--|------|------|--------|--------|
| | Equal variances not assumed | | | | -5.007 | 53.809 | | -1.7 | 0.34 | -2.381 | -1.019 |
|--|-----------------------------|--|--|--|--------|--------|--|------|------|--------|--------|

P: 0.000

Return To Normal Activity (RTNA):

In Desarda's group, the duration to return to normal activity was <7 days in 38(63.3%) patients, 7-15 days in 16(26.7%) patients, > 15 days in 6(10%) patients.

In Lichtenstein's group, the duration of return to normal activity was <7 days in 6(10%) patients, 7-15 days in 36(60%) patients, > 15 days in 18(30%) patients.

| | | | | | |
|------|-------------|----------------|------------------|----------------------------|-------|
| | | | DRLMR | | Total |
| | | | Desarda's repair | Lichtenstein's Mesh Repair | |
| RTNA | < 7 Days | Count | 38 | 6 | 44 |
| | | % within DRLMR | 63.3% | 10.0% | 36.7% |
| | 7 - 15 Days | Count | 16 | 36 | 52 |
| | | % within DRLMR | 26.7% | 60.0% | 43.3% |
| | > 15 Days | Count | 6 | 18 | 24 |
| | | % within DRLMR | 10.0% | 30.0% | 20.0% |

P: 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 complications like chronic groin pain, seroma, and rarely testicular atrophy, mostly in the hands of less experienced junior surgeons. Mesh is more expensive and is not available in many parts of the country. Though mesh acts like a mechanical barrier, it does not provide a mobile and dynamic posterior wall⁽⁹⁾.

Standard tissue repairs like Shouldice, Bassini also require expertise and are associated with tension in the repaired tissue⁽⁸⁾.

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⁽⁶⁾, with Lichtenstein's tension free mesh repair. This method satisfies the rule of 'No tension', 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 tendoponeurotic, is the best alternative to the mesh, which is used in Desarda's technique⁽⁹⁾.

In this study, incidence of inguinal hernia was highest in the 4th 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^{7, 8, 10, and 12)}

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

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 entrapment⁽⁵⁾, which affects the quality of life of the patient. Desarda's technique being a pure tissue repair, and hence no fibrous reaction to produce groin pain. In our 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's group was 8.26 days whereas it was 12.58 days in the Lichtenstein group. In our 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

Desarda et al showed a recurrence of 1.97%, but it was observed during a 10year 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 technique is easy to learn and simple when compared to other tissue repair techniques and this 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 there is early return to normal activity. 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 study and Long term follow up may be required to identify the recurrent cases.

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Conflict Of Interests

All authors declared no potential conflicts of interest related to the research, authorship, and publication of this article.

Ethical Approval

This protocol was approved by the institutional ethics committee

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