



ORIGINAL ARTICLE

## Outcomes of desarda and lichenstein repair under local anesthesia in terms of operative time, pain, urinary retention, wound infection and recurrence rate.

Ahmed Siddique Ammar<sup>1</sup>, Daniyal Anwer Shiraz<sup>2</sup>, Maham Qazi<sup>3</sup>, Muhammad Shoaib<sup>4</sup>, Humaira Alam<sup>5</sup>, Muhammad Aslam<sup>6</sup>

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**ABSTRACT... Objective:** To compare the outcomes of Desarda repair and Lichtenstein hernioplasty under local anesthesia in terms of operative time, post operative pain, post operative urinary retention frequency, rate of wound infection and recurrence rate of hernia one year after surgery. **Study Design:** Prospective Comparative study. **Setting:** Department of General Surgery of CMA Teaching and Research Hospital which is Teaching Hospital of Azra Naheed Medical College Lahore. **Period:** 1<sup>st</sup> February 2021 to 31<sup>st</sup> January 2023. **Methods:** A sample size of 200 patients was calculated divided in two groups randomly having 60 patients each. Outcomes were measured and Data was collected on a predesigned proforma and was analyzed using SPSS 20 and level of significance was considered at  $p = \leq 0.05$ . **Results:** The mean age of patients was 31.5 years with SD of  $\pm 13.31$ . Wound infection rates are slightly higher ( $n=7, 7\%$ ) in Lichtenstein group as compared to Desarda groups done under local anesthesia ( $P$ -Value = 0.000). The operative time (37.9 minutes  $\pm$  SD 10.2 minutes) was less in Lichtenstein repair as compared to Desarda repair and post operative pain 12 hours after surgery ( $3.90 \pm$  SD 2.48) is higher in Lichtenstein group ( $P$ -Value = 0.000). However, recurrence after 1 year is more in Lichtenstein group ( $n=9, 9\%$ ). **Conclusion:** Desarda repair has clear advantages over Lichtenstein mesh hernioplasty in terms of less post operative pain, recurrence after one year and wound infection. However, the operative time is more in Desarda repair.

**Key words:** Anesthesia, Hernia, Lichtenstein, Pain, Recurrence.

### INTRODUCTION

Hernia is defined as protrusion of a viscous or part of viscus through the wall of its containing cavity. Inguinal hernia most commonly occurs in males. The majority of inguinal hernia cases are in men. Hernias occur in 11 out of 10,000 individuals between the ages of 16 and 24, but 200 out of 10,000 patients are 75 years of age and older.<sup>1</sup> The literature provides numerous techniques for treating inguinal hernias, including as Shouldice, Darn, Lichtenstein, and Desarda repairs. Because Lichtenstein hernia repairs have better results in terms of decreased postoperative pain and recurrence rates, they are the most widely performed repair in the world.<sup>2</sup> On the other hand, Desarda repair is relatively new with no mesh related complications as reported in Lichtenstein hernia repair.<sup>3</sup>

Inguinal hernia is usually done under spinal anesthesia but it can be done under local anesthesia.<sup>4</sup> When a patient is too old or has too many co-morbid problems to be eligible for spinal or general anesthesia, local anesthesia is typically employed.<sup>5</sup> However, only a small number of studies demonstrated that local anesthesia was preferable than spinal and general anesthesia in terms of fewer problems following surgery.<sup>6,7</sup> Local anesthetic hernia repair is less invasive and more economical, but its administration requires a thorough understanding of nerve anatomy and little structural manipulation.<sup>8</sup>

There is comparatively less data available in literature showing comparison of results of Lichtenstein and Desarda repair under local anesthesia. The purpose of this study is to compare the post operative outcomes of inguinal

1. MBBS, MS, FACS, CHPE, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.  
2. MBBS, FCPS, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.  
3. MBBS, FCPS, Assistant Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.  
4. MBBS, FCPS, Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.  
5. MBBS, FCPS, Associate Professor General Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.  
6. MBBS, FCPS, Professor Surgery, Azra Naheed Medical College/CMA Hospital, Lahore.

**Correspondence Address:**  
Dr. Ahmed Siddique Ammar  
Department of General Surgery  
Azra Naheed Medical College/CMA Hospital,  
Lahore.  
asammar1912@gmail.com

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hernia repair by Lichtenstein and Desarda repair under local anesthesia.

## METHODS

It was a comparative study carried out at the Azra Naheed Medical College Lahore teaching hospital, the CMA teaching and research hospital's department of general surgery. The study continued for two years, started on February 1, 2021, and ended on January 31, 2023. Following approval by the Azra Naheed Medical College's institutional review board (19-01-21), a sample size of 200 patients was determined with a 90% confidence level, 5% absolute precision, 3.9% anticipated wound infection, and 1.9% urine retention.<sup>9</sup> The formula used was  $n = Z^2 \frac{1-\alpha/2}{d^2}$ . Where  $Z^2 \frac{1-\alpha/2}$  = confidence level 90% = 1.645;  $P_1$  = population proportion 1 = 3.9%;  $P_2$  = population proportion 2 = 1.9%; and  $d$  = absolute precision = 5.

Non-convenience probability sampling was used to increase the sample size from patients with complete and reducible inguinal hernias who were admitted through the general surgery outpatient department (OPD) at CMA Teaching Hospital and were older than 18. A twofold equal grouping of individuals was created according to the type of hernia repair. Those in Group B had Lichtenstein repair whereas those in Group A underwent Desarda repair. Individuals with persistent irreducible and strangulated hernias, skin infections, and a post-micturition volume more than 30 milliliters as assessed by urinary bladder ultrasonography were not included. Thirty minutes before to the incision, the third-generation cephalosporin injection ceftriaxone 1gm intravenous (IV) was administered, after the participants' informed and written permission. Using standard weight polypropylene mesh and the Lichtenstein mesh hernioplasty and Desarda repair procedure, all operations were carried out by a consultant surgeon with over three years of experience. Desarda MP et al. described the Desarda hernia repair procedure, and Ramesh K et al. described the Lichtenstein mesh repair technique.<sup>10,11</sup> Local anesthesia was employed using step by step procedure as defined in literature by Olsen J et al.<sup>12</sup>

The outcomes were measured using the following metrics: post-operative discomfort, wound complications, hernia recurrence within a year, and urine retention. Urinary retention was defined as the inability to empty the bladder entirely or partially eight hours after surgery. The two criteria used to measure wound complications were wound hematoma, which was defined as a collection of blood visible on examination or wound seroma at 24 hours, and wound infection, which was defined as pain and localized swelling of the wound with purulent discharge from which the organism was isolated on culture after five days following the surgery.

An inguinoscrotal ultrasound conducted a year after surgery, confirming the hernia defect, and the existence of swelling at the operated site with a positive cough impulse when lying in bed or standing are indicators of a hernia recurrence. Twenty-four hours following the surgery, the visual analogue score (VAS) was used to gauge post-operative discomfort.

Using a proforma that was pre-designed, data was gathered and SPSS 20 was used for analysis. Urinary retention, post-operative discomfort, hernia recurrence, and wound complications measured by wound hematoma, seroma, and infection were the study factors. To determine whether there was a statistical difference, the groups were compared. Frequencies and percentages were used to represent qualitative data, whereas mean  $\pm$  standard deviation (SD) was used for quantitative variables. The chi-square test was used to compare the groups, and a significance level of  $p \leq 0.05$  was applied. According to our hypothesis, which states that even with age differences, the results would be comparable, the group differences had to be negligible in order for the hypothesis to hold true.

## RESULTS

Out of total 200 patients (100 in each group), 170 (85%) were male and 30 (15 %) were females. The mean age of patients was 31.5 years with SD of  $\pm 13.31$ . The minimum age was 23 while the maximum age was 77 years. Age distribution with their mean and standard deviation of patients in

both groups is shown in Table-I.

It is clear from Table-II that wound infection rates are slightly higher ( $n=7$ , 7%) in Lichtenstein group as compared to Desarda groups done under local anesthesia (P-Value = 0.000). The operative time ( $37.9$  minutes  $\pm$  SD  $10.2$  minutes) was less in Lichtenstein repair as compared to Desarda repair and post operative pain 12 hours after surgery ( $3.90 \pm$  SD  $2.48$ ) is higher in Lichtenstein group (P-Value = 0.000). However, recurrence after 1 year is more in Lichtenstein group ( $n=9$ , 9%) (Table-II).

	Group A Desarda Repair	Group B Lichtenstein Repair
Mean	31.8 years	29.3 years
Median	25	25
Standard Deviation	13.74	11.6

**Table-I. Age distribution of different patients in Desarda and Lichtenstein groups.**

## DISCUSSION

The most regularly done elective surgery is inguinal hernia repair, which is frequently the surgical resident's first elective procedure during their surgical residency.<sup>13</sup> The choice of hernia repair and type of anesthesia usually depend on preference of surgeon, anesthetist and patient.<sup>14</sup> A surgeon also takes into account the procedure's intricacy, length, length of hospital stay following surgery, and cost-effectiveness. Because of a natural deformity in the inguinal area where the testis descends from the abdomen to the scrotum, inguinal hernias are more common in men than in women.<sup>15</sup> In a study done by Sanna A et al, the ratio of male to female for inguinal hernia is 5:1.<sup>16</sup> These results are also endorsed by our study which also showed that inguinal hernia is commonly found in male patients as compared to female patients (170 (85%) vs 30 (15 %)) (5.6:1).

The ratio of direct vs indirect inguinal hernia in our study was almost equal (107 (53.5%) indirect hernia vs 103(51.5%) direct hernia).

Desarda repair is relatively new technique and is known to be safer than Lichtenstein mesh hernioplasty in terms of complications related to mesh.<sup>17</sup> The most common and dangerous complication of mesh reported in literature is mesh infection.<sup>18</sup> When a patient's own aponeurosis is used as a barrier between the inguinal ligament and the muscle arch to strengthen and physiologically dynamically enhance the posterior wall, the complication rate is significantly lower following Desarda repair. Numerous investigations found that after Lichtenstein hernia surgery, wound infections were more common.<sup>11,19</sup> However, studies that have been published have indicated a lower rate of wound infection with Desarda repair. Studies revealed that individuals undergoing Desarda repair had a lower rate of wound infections than those undergoing Lichtenstein repair.<sup>20,21</sup> The results of our study also showed that there was less incidence of wound infection in patients who underwent Desarda repair ( $n=3$ , 3%) as compared to Lichtenstein hernia repair ( $n=7$ , 7%).

Following hernia surgery, urinary retention is a typical consequence. Urine retention was more common during spinal anesthesia procedures, although post-operative urine retention under local anesthesia is extremely rare.<sup>22</sup> The risk factors for post operative urinary retention include age of patient, gender, pre operative diagnosis of Benign prostatic hyperplasia (BPH).<sup>23</sup> One typical side effect following hernia surgery is urinary retention. Under spinal anesthesia, urine retention was more common; however, under local anesthesia, the risk of post-operative urinary retention is very low.<sup>24</sup>

	Desarda (n, %)	Lichtenstein (n, %)	P - Value
Wound infection	3 (3%)	7 (7%)	0.000
Urinary retention	2 (4%)	6 (6%)	0.000
Recurrence after one year	3 (5%)	9 (2%)	0.001
Post operative pain	$2.32 \pm$ SD $1.71$	$3.90 \pm$ SD $2.48$	0.000
Operative time	$46.7$ minutes $\pm$ SD $9.7$ minutes	$37.9$ minutes $\pm$ SD $10.2$ minutes	0.000

**Table-II. Frequency and percentages of wound infection, Urinary retention, Recurrence after 1 year, post operative pain and Operative time in Desarda and Lichtenstein groups operated under local anesthesia.**

In our study only 2 patients develop post operative urinary complications in Desarda group while 6 patients developed retention in Lichtenstein group. Most of these patients were of age more than 50 years and had diagnosis of BPH on preoperative ultrasound. Among 8 patients the retention was managed by foley catheterization in 5 patients while retention in 3 patients was relieved spontaneously.

The operative time among two groups in our study is non-significant. However operative time is more in Desarda group (46.7 minutes  $\pm$  SD 9.7 minutes) in our study as compared to Lichtenstein group (37.9 minutes  $\pm$  SD 10.2 minutes). This is due to certain factors. The technique of Desarda repair is very new and technically challenging due to the creation of an external oblique aponeurosis flap and subsequent suturing to the inguinal ligament. It can be challenging to create an external oblique muscle flap in young patients with muscularity. Additionally, there is a greater risk of bleeding with Desarda surgery compared to Lichtenstein hernia repair, which is a relatively simple technique provided that the correct anatomy is observed. Few research shown a shorter surgical time for the repair of a Lichtenstein hernia, but the majority of studies demonstrated a relatively longer operative time for Desarda repairs.<sup>12,25</sup>

There are certain limitations to this study. First it is a single center study. More multicenter studies are needed in this regard to give more convincing data regarding the operative time and wound infection rates among both groups under local anesthesia. Secondly sample size is relatively less. Relatively large sample size is needed to better interpret the results on different type of hernia repair under local anesthesia.

## CONCLUSION

Both Desarda repair and Lichtenstein mesh hernioplasty are safe procedures under local anesthesia. In comparison with each other, Desarda repair has clear advantages over Lichtenstein mesh hernioplasty in terms of less post operative pain, recurrence after one year and wound infection. However, the learning curve

of Desarda repair is more which in turn causes more operative time while doing Desarda repair as compared to Lichtenstein mesh hernioplasty.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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**AUTHORSHIP AND CONTRIBUTION DECLARATION**

1	<b>Ahmed Siddique Ammar:</b> Manuscript writing.
2	<b>Daniyal Anwer Shiraz:</b> Revising it critically for important intellectual content.
3	<b>Maham Qazi:</b> Proof read.
4	<b>Muhammad Shoaib:</b> Data collection.
5	<b>Humaira Alam:</b> Data analysis.
6	<b>Muhammad Aslam:</b> Design of the work.