

Comparison Between Short Term Outcomes of Lichtenstein and Desarda Repair for Inguinal Hernia

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ABSTRACT

Desarda repair for inguinal hernia repair came into being in 2001 and was an alternative to the Lichtenstein repair where mesh placement is necessary. The procedure is thought to be simple, reproducible and avoids the complications of a mesh and thus favorable for resource limited countries. Aim of the study was to compare short term outcomes of Lichtenstein versus Desarda repair for inguinal hernia in terms of mean post-operative pain and frequency of post-operative wound infection, scrotal edema and hematoma.

Methodology: This RCT was conducted at Surgical Unit I, Fatima Jinnah Medical University, Lahore. Diagnosis of inguinal hernia was confirmed on clinical examination and per-operative findings. Two groups were formed with one undergoing Desarda repair and one Lichtenstein repair. Post-operative scrotal edema and hematoma formation, pain scores and wound infection were recorded and evaluated for both groups.

Results: The overall incidence of scrotal edema was 5.0% (n=3) with 6.7% in Lichtenstein group and 3.3% in Desarda repair group. The overall incidence of hematoma formation was 0% (n=0), and the overall wound infection rate was also 0%. The overall mean for pain score for all study participants was 2.73 S.D 1.36. Mean pain score in Desarda repair was 2.13 S.D 1.30 and 3.33 S.D 1.15 for Lichtenstein group (p-value 0.001).

Conclusion: Desarda repair is an economical repair especially for resource-limited countries and should be undertaken in place of a Lichtenstein repair where mesh cost and availability poses a problem. The Desarda repair has a better morbidity profile than the Lichtenstein repair and with more data generation may have a place to become the standard open inguinal hernia repair technique.

Keywords: Desarda Repair; Lichtenstein Repair; Short-term outcomes

INTRODUCTION

Inguinal hernia repair is one of the most frequently performed general surgical procedure due to high life time risk approaching 27% in males and nearly 3% in females of developing an inguinal hernia. An ideal repair is the one which is not only cost effective, but is tension free, respecting the tissues and incorporates a posterior wall that is physiological and dynamic with the repair incurring low rate of recurrence. This should further be supplemented by the fact that the repairs are both easy to learn, reproduce and perform.¹

According to the 2009 guidelines published by the European Hernia Society, Lichtenstein technique of tension free repair is recommended as procedure of choice for an open inguinal hernia repair. This repair was introduced in 1984, and has been reported to have low recurrence rate, approximating less than 4%, but with complications such as chronic pain, foreign body sensation, abdominal wall stiffness, migration of the mesh into the abdominal cavity, infection of mesh and meshoma formation.²

Desarda in 2001 reported results of his tension-free technique, using the external oblique aponeurosis, a recurrence rate of 0.25% in his study on 400 patients with a ten year follow up.³ The benefits of a Desarda repair lie in the fact that its simple to learn with no complex dissection and the repair does not involve using a mesh with its accompanying complications.^{4,5}

A regional retrospective study has highlighted in favor of Desarda repair in terms of less mean post-operative pain on visual analogue scale at 24 hours with a mean pain score of 2.73 S.D 1.64 for Desarda repair and 3.33 S.D 1.75 for Lichtenstein repair with a P value of 0.0004 signifying statistical significance. They further found that on the 7th post operative day, pain score on visual analogue scale was 1.46 S.D 0.65 for Desarda repair and 1.52 S.D 0.68 for Lichtenstein repair with a p value of 0.644. They also found that surgical site infections were 0% in both groups.¹

In Pakistan, Desarda repair is relatively less performed with few surgeons comfortable and knowledgeable of the technique,

further only a few local studies have highlighted better initial results with Desarda technique alone or in comparison to Lichtenstein repair.⁶⁻⁸

The alternative technique that the Desarda repair presents in lieu of a Lichtenstein repair holds the promise of less early and late mesh related post-operative complications. In Pakistan's socioeconomic structure, one can imagine that a Desarda repair eliminates the cost of a mesh and the costs of morbidities that may ensue with a mesh. Evidence generation in the local setting may help contribute to a change in local practice and this belies the reason why this study was conducted. Aim of this study was to compare short term outcomes of Lichtenstein versus Desarda repair for inguinal hernia in terms of mean post-operative pain and frequency of postoperative wound infection, scrotal edema and hematoma.

MATERIALS AND METHODS

After approval from ethical review committee of the hospital, 60 patients who presented in the Out-patient Department of Surgery, fulfilling the selection criteria and after consultant evaluation were included. Criteria was - All male patients of age 18-65 years having unilateral reducible indirect or direct inguinal hernia diagnosed on clinical examination were included in the study. Any patient with diabetes, hypertension or renal failure, Bilateral inguinal hernia, Irreducible or obstructed hernias assessed clinically, or Recurrent inguinal hernia was excluded.

Randomization was carried out using a web based program, and groups were formed with Group A undergoing Desarda Repair and Group B undergoing Lichtenstein Repair.

Duration of study was from January 2018 till March 2021, after approval of synopsis. Sample size of 60 was calculated with 30 in each group, using a confidence interval of 95%, power of test at 80%, and using expected mean pain scores for Desarda repair² as 2.4 S.D 1.9 and for Lichtenstein¹ 3.5 S.D 0.97.

Repairs were performed under spinal anesthesia and the surgery itself was carried out by the same consultant surgeon with the primary investigator assisting. Prophylactic Co-amoxiclav 1 gram intravenously was administered prior to making the skin incision within 20 minutes. This further administered for 2 further doses at 8 hourly intervals.

Mean of all pain scores on visual analogue scale for each group of patients on same post-operative hour. Pain score will be assessed at 24th post-operative hour. At this post-operative hour mean of all pain scores of a group will be calculated and will be compared to the mean of pain score of other group.

Post-operative analgesia was given to both groups similarly, with Ketorolac 30mg intravenous administered thrice a day during in-patient stay and oral diclofenac 50mg twice a day on discharge. For patients who developed wound infections, grade 1 and 2 infections were given oral antibiotics for one week, name Co-amoxiclav 1 gram twice daily. For grade 3 and 4 infections patients were given intravenous antibiotics, along with irrigation of the open 2-3 times a day with dressings and samples for culture and sensitivity were sent.

Wound infections were assessed at discharge and then at 1 week post-operatively on follow up; scrotal edema and hematomas were recorded during the hospital stay of 48 hours and pain scores were recorded post-operatively at hour 24 using the visual analogue score.

All the collected data was entered and analyzed through SPSS version 24.0. Numerical variables; age and pain scored have been presented by mean ±SD. Categorical variables i.e gender, scrotal edema, hematoma, wound infection have been presented by frequency and percentage. Chi-square and T-test was used to assess association between the two groups for the following variables: Pain score, scrotal edema, wound infection and hematoma formation with P value < 0.05 as significant.

RESULTS

The age of the patients ranged from 18 years to 65 years with a mean of 38.1±14.1 years. The mean age in the Desarda repair group was 36.7 S.D 13.26 and in the Lichtenstein repair group the mean age was 39.5 S.D 15.0.

The overall incidence of scrotal edema was 5.0% (n=3) and hematoma formation was 0%, and the overall wound infection rate was also 0%. The frequency of post-operative outcomes is shown in the table. Chi-square analysis was done to see if there was an association between type of surgery and development of scrotal edema wherein scrotal edema was present in 6.7% of patients undergoing Lichtenstein repair and 3.3% of patients undergoing Desarda repair; there was no significant association found between the type of surgery and the development of scrotal edema.

The presence of scrotal edema was stratified according to age (less than 30 years and equal to or greater than 30 years) for both procedures and a chi-square analysis showed that no association existed. (p-value <0.05) However, a chi-square analysis done for age and scrotal edema regardless of the type of procedure done, showed a p-value of 0.04. This showed that significant association existed where after inguinal hernia surgery patients younger than 30 years may be more likely to develop scrotal edema. The overall mean for pain score for all study participants was 2.73 S.D 1.36. Independent sample t-test was used to compare the mean pain scores, and there was a significant difference between the two groups with a p-value of 0.001, using a p-value less than 0.05 as significant. The t-test shows that the mean pain scores of the Desarda repair were significantly less as compared to the Lichtenstein repair group.

A bivariate analysis was done of age and pain scores, and we found that the Spearman's Rho was -0.77 with a p-value of 0.56. There was no statistically significant association as the p-value was greater than 0.05, however from the Rho one can deduce that with increasing age, less pain was felt for all participants undergoing inguinal hernia surgery. Chi-square

analysis was done to see if an association existed between scrotal edema and higher pain scores. The p-value was 0.83, using a p-value of 0.05 and less as significant, we can deduce that there is no significant association between pain scores and the presence of scrotal edema.

Mean BMI was 20.5 S.D 3.2 kg/m² which was lower than the South Asian obesity BMI score; and patients that had scrotal edema the mean BMI was 19.3 S.D 3.21 kg/m² and for patients with no scrotal edema mean BMI was 20.5 S.D 3.48 kg/m².(p= 0.54) The mean BMI for patients with scrotal edema and without scrotal edema in the Desarda group was 18.00 S.D 0.00 kg/m² and 20.3 S.D 3.79 kg/m². (p=0.549)

In the Desarda group using the mean BMI of 20.5kg/m² as a cut-off it was found that the mean pain score for those with a BMI greater than or equal to 20.5 kg/m² was significantly different (p=0.02), showing that patients with a BMI higher than 20.5 kg/m² have higher pain scores.

Table 1: Frequency of Post-operative Outcomes.

Outcome	Total (N=60)	Desarda (N=30)	Lichtenstein (N=30)
Scrotal Edema	3 (5%)	1 (3.3%)	2 (6.7%)
Hematoma formation	0(0%)	0(0%)	0(0%)
Wound infection	0(0%)	0(0%)	0(0%)

Table 2: Chi-square association analysis of frequency of Scrotal Edema in 48 hours post-operative hospital stay according to type of surgery.

Operative Procedure	No	Yes	Chi-square	P-value
Lichtenstein	28 (93.3%)	2 (6.7%)	0.351	0.554
Desarda	29 (96.7%)	1 (3.3%)		

Table 3: Mean pain scores for each group along with Independent Sample T-test results.

Procedure	Mean Value	Standard Deviation	T-Test	P-value
Lichtensein	3.33	1.15	3.770	0.001*
Desarda	2.13	1.30		

*P-value less than 0.05 considered significant

DISCUSSION

In our study of 60 participants with 30 in each group that is LR and DR; we found that out of the three measurable short term outcomes, we had no wound infections and no scrotal hematoma formation, however there were 5% overall scrotal edema in both the LR and DR groups, and when assessed by group 3.3% scrotal edema was present in the DR group and 6.7% in the LR group. Compared to previous studies, this rate is much lower for both the repairs. Scrotal edema was reported to be 6.52%-7.1% in Desarda repair and in LR group it was reported to be 5.6%-25%.⁹⁻¹¹ Another randomized control trial corroborated these findings and found that Desarda repair was superior to LR in lesser scrotal edema formation.¹²

In a meta-analysis comparing both the techniques it was found that surgical site infections occurred more commonly in the LR group with a relative risk of 0.36. However it did not find hematoma formation to be significantly different between the two groups.¹³ In our patient subset we found no wound infections, possibly due to the fact that all surgeries were elective surgeries and that they all occurred under antibiotic prophylaxis and that antibiotics were continued post-operatively. A large prospective study that was done for patients undergoing LR found that the inclusion of antibiotic prophylaxis reduced their wound infection rate¹⁴, thus we can see that antibiotics in inguinal hernia surgery play a reasonably supportive role especially in countries like Pakistan with limited resources and poor access to sanitation.

Another systematic review done by Ge et al. found that overall there was no significant difference between the two techniques and they were both equally feasible and safe. There was no advantage of either procedure over the other in terms of post-operative pain upto 2 weeks. Wound infection rates averaged 1% for DR group and 1.9% for the LR group, though statistically

not significant, there was a small appreciable clinical difference in favour of the DR group. This is similar to our results where we found that there was no difference between the groups in terms of wound infections. Hematoma formation was 5.9% for the DR group and 6.1% for the LR group, again clinically similar and without any statistically significant difference. Our study however found there were no hematoma formations in either group and both techniques were comparable¹⁵.

Keeping in mind these two systematic reviews and data from other studies, we can assume that our studies findings are similar in terms of wound infection, scrotal edema formation and hematoma formation as the available literature in that there is no difference between the two repair techniques and neither is superior to the other in terms of these.

To the best of our knowledge, our study is the first of its kind reporting stratification of scrotal edema by age and it found that scrotal edema development was associated with age with a statistically significant association by Chi-Square test, thus meticulous dissection and tissue handling in all cases and ages should be prescribed but even more so with advancing age and for those above the age of 30. Our study also reports that there is no significant association between technique used and the development of scrotal edema, which is similar to the results of the previously discussed studies.

Scrotal edema and post-operative pain levels were not statistically significant. An Independent Sample T-test showed that the two groups had significantly different mean pain levels. Desarda repair had considerably lower mean pain levels than Lichtenstein repair, according to the t-test.

Gedam et al reported a mean pain score of 2.72 S.D 0.44 for LR and 2.43 S.D 0.61 for DR, the mean pain scores are similar to our studies and comparable. They found similar to our study that the pain scores were significantly less in the DR group¹⁰. The meta-analysis done by Ge et al found that there is no significant difference between two techniques in terms of pain score, however this is in contrast to our study findings.¹⁵

Age and pain scores were bivariate analyzed, and Spearman's Rho was -0.77 with a p-value of 0.56. The p-value was more than 0.05, yet the Rho showed that all inguinal hernia surgery patients felt reduced pain with age. It is intriguing that discomfort decreases with age, possibly due to lower collagen content or less firm muscle tone, making the repair less tight. These findings suggest that younger patients undergoing open inguinal hernia surgery should pay special attention to nerve management and suture line tension. Our outcomes were comparable to other trials and may have had a superior morbidity profile for both procedures. We had a modest number of patients per group, but compared to other trials, heterogeneity was not substantial. Desarda repairs reduce post-operative discomfort and scrotal edema better than Lichtenstein repairs.

CONCLUSION

The author believes that Desarda repair is an economical repair especially for resource-limited countries and should be undertaken

in place of a Lichtenstein repair where mesh cost and availability poses a problem. The Desarda repair has a better morbidity profile than the Lichtenstein repair and with more data generation may have a place to become the standard open inguinal hernia repair technique.

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