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Comparison between Desarda's Inguinal Hernia Repair and Lichtenstein Hernioplasty in terms of Complications, Operative time and Cost-effectiveness

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ABSTRACT

Objective: To compare Desarda tissue-based repair with the traditional Lichtenstein hernioplasty in terms of complications, operative time and cost-effectiveness.

***Study Design*:** Comparative Cross-sectional Study.

Place and Duration of Study: Surgical Department Combined Military Hospital, Mailsi Pakistan, from Dec 2019 to Dec 2020.

Methodology: Lichtenstein (Group-I) and Desarda (Group-II) were randomly allocated to 140 patients with inguinal hernia, 70 in each Group, respectively. Both Groups were compared in terms of postoperative complications, cost evaluation and operative time.

Results: The mean operative time in Group-I was 54.5±4.09 minutes, whereas in Group-II, it was 70.24±5.30 minutes. The mean cost estimated in Group-I was 4400±225 rupees, while in Group-II, it was 850±150 rupees, respectively. Desarda's repair was comparable to Lichtenstein's hernioplasty in terms of postoperative complications.

Conclusion: Desarda's hernia repair is more cost-effective than the Lichtenstein procedure for treating inguinal hernia. Reduced surgical time, faster restoration to normal gait, and return to work are all the possible benefits of the Lichtenstein repair. Furthermore, Lichtenstein hernioplasty is a better option in patients with weak external oblique aponeurosis.

Keywords: Desarda's repair, Inguinal hernia, Lichtenstein hernioplasty.

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INTRODUCTION

Inguinal hernia repair is the most widely performed surgery.[1] Over the course of their lives, 27% of men and 3% of women will require inguinal hernia repair.[2] According to 2009 European Hernia Society guidelines, mesh-based techniques, particularly the Lichtenstein technique and endoscopic methods, are recommended for treating symptomatic primary inguinal hernia in adults, while the Shouldice hernia repair is the best non-mesh repair method with a recommendation strength level of 1A. Recurrence rates with the Shouldice approach range between 0.7% and 1.7% in competent hands but can reach 15% in routine practice due to the difficulty of dissection and regeneration of tissue.

Lichtenstein surgery is the most widely used procedure due to its minimal postoperative complications and low recurrence rates.[3,4] There is significant controversy about whether using mesh in hernia repair increases the prevalence of persistent groin discomfort from 1% to 28.7%.[5] Mesh implantation in the inguinal area has been associated with complications like foreign body sensation in the groin, pain, and abdominal wall rigidity.[6] Migration of mesh to the colon, urinary bladder, femoral vein, preperitoneal region, and scrotum has been documented, along with reports of mesh rejection.[7] Sexual dysfunction has been reported following mesh repair.[8] Surgical site infection is also a known complication of mesh repair.[9]

Desarda pioneered a ground-breaking novel approach to tissue-based hernia repair in 2001. According to the Desarda, it neither requires sophisticated dissection nor mesh. It is simple to learn and more affordable for poor patients.[10] This study compared the complications, operative time and cost-effectiveness between Lichtenstein hernioplasty and Desarda hernia repair in the adult population with uncomplicated inguinal hernias in South Punjab, Pakistan.

METHODOLOGY

It was a comparative cross-sectional study conducted at the Surgical Department Combined Military Hospital, Mailsi Pakistan from December 2019 to December 2020 after approval of the Ethical review board committee (IRB Certificate Number: 2004 dated 16 Nov 2019) and taking written consent from patients.

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The sample size was calculated using the WHO calculator estimating the difference between two population proportions tests using a confidence level of 95%, absolute precision of 0.1, anticipated popula-tion proportion 1 of 20.5% and anticipated population proportion 2 of 55%.[10] The sample size was a minimum of 68 patients in each Group. We employed 70 patients in each Group, with the total study sample becoming 140 patients. Consecutive non-probability sampling method was used.

Inclusion Criteria: All the male patients between the ages of 18 to 65 years diagnosed as the cases of uncomplicated unilateral inguinal hernia having ASA class I-III were included in the study.

Exclusion Criteria: Patients with recurrent inguinal hernia, bilateral inguinal hernia and complicated inguinal hernia like strangulated or obstructed hernia were excluded from the study. In addition, patients with diabetes mellitus, chronic cough, hypertension, chronic obstructive pulmonary disease, obstructive uropathy, and ASA IV and V were excluded from the study.

Preoperative workup was carried out, including history taking, clinical examination and basic laboratory investigations. Patients were divided into two groups, Lichtenstein mesh-repair (Group-I) and Desarda tissue-based repair (Group II). The oblique inguinal incision was used in all procedures. Dissection and assessment of the strength of the external oblique aponeurosis were done.

Group-I: Lichtenstein hernioplasty was carried out. A 6 x 11 cm polypropylene mesh was fashioned to fit the posterior wall of the inguinal canal. First, suturing the mesh to the pubic bone's fibro-periosteum and continuing laterally with non-absorbable interrupted prolene 2/0 sutures until a point 2 cm lateral to the internal ring. A 2 cm gap was created laterally through the mesh to accommodate the cord. Next, suture the mesh's superior border to the conjoint tendon while suturing the mesh's two tails to form a new deep ring of mesh. Suturing the spermatic cord back into the inguinal canal was then performed. The superficial fascia and skin were closed.

Group-II: After skin incision, external oblique aponeurosis was incised, and the cord was lifted. Herniotomy was done for indirect hernia, or sac is reduced back of direct hernia. First, the upper leaf of external oblique aponeurosis was sutured with Vicryl 2.0 to the lower part of the inguinal ligament. Next, a transverse incision was given at the middle part of EOA, stitched to an inguinal ligament extending from the pubic tubercle to 1-2 cm lateral to the deep ring. Thus a new strip of external oblique aponeurosis was formed, upper margin of the newly formed strip was sutured with Vicryl 2.0 to the conjoint tendon. This strip then acted as a newly created posterior wall and mesh. Finally, the cord was retracted, and the wound closed as standard. The duration of the surgery was calculated from the point of skin incision to skin closure.

The patient was examined in an outpatient clinic during the first and second postoperative weeks. A physical exam was done during follow-up visits to detect hernia recurrence and postoperative complications associated with both operations. In addition, patients were evaluated whether a nerve had been injured by examining the extent of numbness or paresthesia in the operation area, groin, or toward the scrotum. Following surgery, the time required to regain a normal gait was determined by the time required to walk and move freely. The return-to-work period was defined as the ability to resume all previously completed tasks (work activities) without experiencing pain.

Statistical Package for Social Sciences (SPSS) version 25.0 was used for the data analysis. Mean±SD were calculated for numerical variables. Frequency and percentage were calculated for categorical variables. The chi-square test was applied for categorical variables, and a t-test was applied for numerical variables. The p-value ≤0.05 was considered significant.

RESULTS

The mean age of patients in Group-I was 50.04±15.07 years, while the mean age was 48.15±13.9 years (p=0.67). The mean BMI in Group-I was 35.07±8.17 Kg/m2, while the mean BMI in Group-II was 36.33±8.76Kg/m2 (p=0.41). Finally, the mean duration of hernia in Group-I was 27.51±17.9 weeks, while it was 30.00±18.45 weeks in Group-II, the difference being statistically non-significant (p=0.66). The comparison of the complications between the two groups was shown in Table-I. Finally, the comparison of the surgical outcomes between the two groups in terms of opera-tive time, time to normal gait, time to return to work and mean cost was shown in Table II.

DISCUSSION

Hernia repairs are among the earliest surgical procedures. The Shouldice repair was able to keep its integrity for an extended time until Lichtenstein's

tension-free repair took over most of Bassini's repair zone.[11,12] In a large multicenter controlled study, recurrence rates for Bassini and McVay repairs were reported to be 8.6% and 11.1%, respectively. Although the Shouldice repair technique has been used for over 30 years, it has a recurrence rate of less than 1% at the hospitals and up to 15% in general surgical practice.[13,14] Shouldice's method does not meet the criteria for a universal surgical treatment for inguinal hernia repair due to the substantial risk of recurrence in non-specialist centres.

Table-I: Comparison of Complications of Lichtenstein and Desarda Repair for Inguinal Hernia (n=140)

Complications	Group-I (n=70)	Group-II (n=70)	*p*-value
	Frequency (%)	Frequency (%)	
Ilio Inguinal Nerve Injury	1 (1.43)	2 (2.86)	0.570
Ilio Hypogastric Nerve Injury	1 (1.43)	1 (1.43)	1.000
Scrotal Edema	2 (2.86)	2 (2.86)	1.000
Scrotal Hematoma	1 (1.43)	1 (1.43)	1.000
Inguinal Hematoma	1 (1.43)	2 (2.86)	0.570
Surgical Site Infection	2 (2.86)	2 (2.86)	1.000
Pain and Numbness in Groin	2 (2.86)	3 (4.29)	0.410

Table-II: Comparison of Surgical Outcomes of Lichtenstein and Desarda Repair for Inguinal Hernia (n=140)

Surgical Outcomes	Group I (n=70)	Group II (n=70)	*p*-value
	Mean ± SD	Mean ± SD	
Operative time (minutes)	54.50±4.09	70.24± 5.30	<0.001
Return to normal gait (days)	3.40± 1.50	5.20±2.30	<0.001
Return to work (days)	16.30±2.60	19.10±2.80	<0.001
Cost (Rupees)	4400.00± 225.00	850.00±150.00	<0.001

A variety of surgeons has widely used prosthetic material.[15] These treatments can be performed open or laparoscopically. Despite major advances in prosthetic material technology, creating a biosynthetic mesh for hernia repair remains an open question. There are certain drawbacks to using a prosthetic material, such as infection, cost, and the formation of a static rather than a dynamic entity. It is widely accepted that mesh implantation might have a detrimental effect on sexual function. Cost-effective and low-recurrence techniques and those that can be learnt quickly and do not require the use of expensive, high-tech equipment should be introduced. We believe the Desarda technique is an excellent beginning point for developing an optimum strategy.[16,17]

Since Desarda's approach was initially published in 2001, debates over its validity and benefits have raged, with some claiming that it is simply a modification of Andrews' method.[6] In comparison to Lichtenstein's technique, many randomized clinical studies were conducted. One of which was conducted by Rodríguez *et al.* In this randomized trial, the Desarda and Lichtenstein methods for primary inguinal hernia repair were evaluated in terms of early and late postoperative results. Post-operative complications and recurrence were comparable between Desarda repair and Lichtenstein repair.[18]

While Lichtenstein's procedure was associated with four recurrences in an Indian hospital, Desarda technique was associated with no recurrences during a clinical trial.[17] On the other hand, recurrence was caused by the Desarda Group's newly repaired deep internal ring. The exclusion of patients with weak or thin external oblique aponeurosis probably led to the absence of weakness in the posterior wall of the inguinal canal rebuilt in our investigation. Desarda Group reported more fibrosis than Lichtenstein's mesh Group, resulting in nerve entrapment and severe groin pain.[18]

The operative time was less in the Lichtenstein Group (54.5±4.09 minutes) than in the Desarda Group (70.24±5.3 minutes) during our investigation (p=0.001). Manyilirah *et al.* also reported comparable results.[19] Prior studies focused exclusively on time required to repair the incision after it was made, but this study added the time required to close it. In some situations, particularly during the later phases of repair, additional traction may have been required, as well as the additional time required to create and position mesh around the cable in mesh cases.

Even though the same surgical team conducted all procedures, personal bias cannot be ruled out. Intraoperative and postoperative complications did not differ significantly between the two research groups. According to the study, the mesh group exhibited a high rate of seroma development. The most often reported concerns in this study were scrotal oedema and hydrocele development, which were addressed conservatively. Compared to Desarda, the Lichtenstein group regained normal gait significantly faster than Desarda. When the mean days to return to work were compared across both groups, Lichtenstein showed early work return. There was no significant difference in the days required to recover to normal gait, basic

activity, or household duties between the two groups, which contrasts with previous studies.[20]

Cost-wise Desarda approach is less expensive because the mesh is not required, albeit mesh does have several disadvantages. Mesh is used to constructing a mechanical barrier. It does not contribute to forming a dynamic and mobile posterior wall. According to its inventor, there is no better alternative to a mesh or Shouldice than an external oblique aponeurosis strip because the tendons and aponeurosis age slowly. This movable aponeurotic band supports the posterior wall of the inguinal canal. As a result, using a naturally displaceable and moveable aponeurotic strip as protection against re-herniation is significantly more "physiological."

CONCLUSION

Desarda's hernia repair is more cost-effective than the standard Lichtenstein procedure for treating inguinal hernias. Reduced surgical time, faster restoration to normal gait, and return to work are all possible benefits of the Lichtenstein Hernioplasty. Post-operative complications were comparable between both procedures. Desarda's repair should be investigated further in complicated hernias also.

Conflict of Interest: None.

Author's Contribtution:

AA:, SUSB:, SAA: Conception of design writing and editing of manuscript, UA: Editing of manuscript, AA:, MWB: Analysis of data.

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