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Comparative study of Desarda repair versus Lichtenstein repair in inguinal hernia: A prospective comparative study

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Abstract

Background: Inguinal hernias are one of the commonest problems encountered by the patients, which requires admission and surgery as its treatment. Present Study aimed to compare the surgical outcomes of Desarda repair versus Lichtenstein repair for inguinal hernia.

Methodology: This present prospective comparative study was conducted among the patients above 18yrs of age getting admitted to hospital with diagnosis of uncomplicated inguinal hernia included after obtaining the informed consent.

Result: Total of 50 patients were included in the study and divided into two groups based on type of surgical treated opted for the patients, in each group 25 patients are included. The overall mean age of all the patients included in the study was found to be 50.32 ± 13.67 yrs. Duration of the surgery, there was significant lower duration of surgical time in Desarda repair (48.2 ± 7.62 mins) compared to Lichtenstein repair (87.4 ± 7.37 mins) ($p < 0.05$). The cost of procedure among the DR group was lower than in the LR group (approximately 3000 and 5000 INR respectively). Found a significant higher pain score among the patients of LR group at 6hr (5.2 ± 1.1) and 12hr (2.4 ± 0.8), compared to DR group at 6hr (3.8 ± 0.8) and 12hr (1.6 ± 0.5). ($p < 0.05$) Number of days to resume to work was significantly lower in DR group (11 ± 1.0 days) compared to LR group (12.8 ± 1.4 days). ($p < 0.05$)

Conclusion: Present study documented a shorter operating time, early discharge and return to work among the patients underwent Desarda repair compared to the Lichtenstein repair. The post operative time and cost of surgery was found to be lower among the Desarda repair.

Keywords: Desarda repair, Lichtenstein repair, complications, operative time, pain

1. Introduction

Inguinal hernias are one of the commonest problems encountered by the patients, which requires admission and surgery as its treatment. Seventy five percent of all abdominal wall hernias are found in the groin, of which 95% are inguinal hernias. A hernia is defined as a protrusion, bulge, or projection of an organ or a part of an organ through the body wall that normally contains it. Collectively, inguinal and femoral hernias are known as groin hernias. Inguinal hernia is more common than femoral hernia and other abdominal wall hernias (eg, umbilical, epigastric), but femoral hernias present with complications more often^[1].

Inguinal hernia most probably has been a disease ever since mankind existed. In view of its existence in different kinds of animals, and in particular of primates, one can assume that already prehistoric human beings were affected with the disease. Written proof of this statement became available from manuscripts and finds in Mesopotamian and Egyptian cultures. So does the famous papyrus Ebers, dating from around 1550 BC, refer to patients suffering from inguinal hernia, quoting its appearance during coughing^[2].

Inguinal hernias have a male predominance with a male to female ration of 9:1. The lifetime risk of a person developing a groin hernia is approximately 15% in males and less than 5% in females^[3].

There had been various surgical methods tried in the hernia repair over the centuries starting with Bassini's repair to the recent Lichtenstein tension free hernia repair surgeries. According to European Hernia Society (EHS) guidelines published in 2009, mesh-based techniques, particularly the Lichtenstein technique and laparoscopic methods are recommended for treatment of symptomatic primary inguinal hernia in adults.

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In recent times a new procedure has been described for inguinal hernia surgery by Dr. Desarda a surgeon from Pune. Desarda's technique is tissue based technique of hernia repair using a detached strip of external oblique aponeurosis to strengthen the posterior wall of the inguinal canal [4]. The Desarda technique of non-mesh based or tissue based hernioplasty was described in 2001. This procedure is a simple procedure that can be done under any type of anaesthesia from general anaesthesia to local anaesthesia. The advantages of this procedure includes, being a physiological repair and tension free, pain is comparatively lower in this procedure [5, 6], no risk of complications in future as there is no mesh placed, can be used in strangulated hernia, [7] recurrence and complication rates equal to or better than Lichtenstein's repair and [6, 8] early ambulation and less time of hospital stay [5, 6] Low cost for the patient as mesh is not used. Simple procedure with equal or less operating time than Lichtenstein's repair [6]. Multiple studies have been done in various countries with good results comparing the procedure with mesh repair.

Since few decades Lichtenstein's mesh repair has been the standard of care in inguinal hernia surgery. Millions of people have undergone this procedure throughout the world though many alternative procedures were there mesh placement had the advantages of: being technically simple, Easy to perform, tension free, less painful and had low recurrence rate compared to other older procedures.

The cost of the surgery, duration of the surgery, post-operative pain, recurrence and chronic pain has been the challenge for various surgeons and patients which inhibit them from resuming back to work early [9].

Novelty: Our study aim is to compare the outcomes of Desarda repair versus Lichtenstein repair in inguinal hernias.

2. Patients and Methods

This study was conducted at Aarupadai Veedu medical college and hospital, Puducherry in the department of General Surgery from December 2019 to October 2021.

After getting Institutional Ethical committee clearance, the study was conducted by obtaining proper consent from the study participants. Consent was obtained by explaining the purpose of study. All the patients above the age of 18yrs who are getting admitted in the hospital with the diagnosis of uncomplicated inguinal hernia were included in the study.

The exclusion criteria that are used for patient selection was Patients less than 18years of age, patients with obstructed, strangulated or incarcerated hernia, recurrent hernias, Connective tissue disorders.

The patients being admitted to the hospital with the diagnosis of uncomplicated inguinal hernia, after taking detailed history and full detailed physical examination and fulfilling the inclusion and exclusion criteria were assessed and counselled about the study. Elderly patients needed further pre-operative workup as a part of pre anaesthetic check-up. All those patients willing to take part in the study, an informed consent explaining the details of the study and alternative options were obtained.

Patients were divided into 2 groups namely DR-group (Desarda repair group) and LR-group (Lichtenstein tension free repair group). DR- group was tissue based technique whereas, LR-group was mesh based technique. All patients were under a single surgical unit and operated by the same surgical team. Anaesthesia was used based on the anaesthetist's option. Incision used was Oblique incision in all procedures. Assessment of the external oblique aponeurosis (EOA) strength was done. Operating time was calculated from the time of skin incision to skin closure.

2.1 DR-group

In the surgical technique for Desarda repair, the external oblique is incised. The spermatic cord is dissected free from the hernial sac. The herniated organs are returned to the abdomen and redundant sac is excised as followed in standard techniques. The upper flap of the external oblique aponeurosis is sutured to the inguinal ligament, *behind* the spermatic cord. Then the external oblique is incised again, 1-2 centimeters above the inguinal ligament, simultaneously creating a new lower edge to the upper flap, and a "strip," or in other words a *patch*, made out of a strip of external oblique that is several centimeters wide. The upper edge of this "patch" is sutured to the internal oblique. The result is that a "patch" of external oblique aponeurosis is in place behind the spermatic cord, similarly to the way a Lichtenstein patch would be in place behind the spermatic cord. Sutured was done using PDSII no.1 (Monofilament Polydioxanone violet, Ethicon) continuous sutures in Desarda technique.

2.2 LR-group:

The Lichtenstein tension free mesh repair group underwent a standard mesh repair using polypropylene mesh fixed using 1 Prolene. Mesh was tailored and was sutured to the pubic bone, to the inguinal ligament and to the internal oblique. A slit was made in the mesh to accommodate the spermatic cord and both the slits were sutured around the spermatic cord again to create a new deep ring. Then again both the flaps of EOA were approximated and sutured and wound closed in layers.

Patients were followed up in the post-op period till discharge and at 1 month, 3 months and for a period of 6 months to assess the outcomes and recurrence. Patients who lost the follow-up were contacted through telephones. The independent variables was Age, Sex, type of hernia (direct/indirect), side of hernia, duration of hernia, Co-morbid conditions. Intra-operatively Size of defect, Time taken for surgery, Surgeon's assessment of external oblique aponeurosis strength was assessed. Post-op pain- measured at 6hrs interval, then at 24 hrs and 48 hrs using a visual analogue scale (VAS). Type of analgesia used in both the groups were same and the analgesic used was Inj. Tramadol 50mg given twice daily to all the patients. Length of hospital stay and day of resuming to work was assessed. Incidence of post-op complications like pain, seroma, SSI's, etc were assessed. Cost of treatment were compared in both groups. Foreign body sensation/ groin discomfort were assessed at the operative site.

3. Statistical Analysis

All the data were filled in proforma and entered in excel sheet. The demographic and study variables were summarized with help of tables and presented using the figures, bar diagram and pie charts. The continuous variables were summarized as mean \pm standard deviation, and categorical or nominal data as frequency and percentage. The inferential statistics was performed for the continuous variables between two groups using student's t-test and for categorical data using the chi-square test. The strength of association between the variables was analysed by Pearson's correlation. a p-value of <0.05 was considered statistically significant.

4. Results

Total of 50 patients were included in the study and divided into two groups based on type of surgical treatment opted for the patients, in each group 25 patients are included. Group LR = Lichtenstein repair and group DR = Desarda Repair.

The overall mean age of all the patients included in the study was found to be 50.32 ± 13.67 yrs of age. The mean age of

patients in LR was 51.8 ± 14 yrs and in DR it was 48.9 ± 13.5 yrs of age. ($p > 0.05$) The diagnosis among the patients, 60% of the patients presented with right inguinal hernia and 40% with left inguinal hernia.

Table 1: Showing the mean age of patients in the study

	N	Minimum	Maximum	Mean	SD
Age in years	50	21.0	75.0	50.320	13.67

Table 2: Showing the comparison of diagnosis between the group

		Desarda Repair		Lichtenstein repair	
		Count	Column N%	Count	Column N%
Diagnosis	Left Inguinal hernia	10	40.0%	10	40.0%
	Right Inguinal hernia	15	60.0%	15	60.0%

Table 3: Showing the comparison of mean age, duration of surgery and cost of procedure between the group using t-test

	Desarda Repair		Lichtenstein repair		t-test (p-value)
	Mean	SD	Mean	SD	
Age	48.9	13.5	51.8	14.0	0.462
Duration of surgery	48.2	7.62	87.4	7.37	0.001**
Cost for procedure	3000.0	.0	5000.0	.0	

Table 4: Comparison of the complications, pain, foreign body sensation and reaction between the groups using chi-square test

		Desarda Repair		Lichtenstein repair		Chi-square (p-value)
		Count	Column N%	Count	Column N%	
Postoperative complications	Nil	25	100.0%	25	100.0%	-
Chronic pain	No	25	100.0%	25	100.0%	-
Foreign body sensation	Absent	25	100.0%	15	60.0%	12.50 (0.001)**
	Present	0	0.0%	10	40.0%	
Foreign body reaction	Absent	25	100.0%	25	100.0%	-
Mesh rejection or infection	Nil	25	100.0%	25	100.0%	-

Table 5: Comparison of the strength of external oblique between the groups using chi-square test.

		Desarda Repair		Lichtenstein repair		Chi-square (p-value)
		Count	Column N%	Count	Column N%	
Strength of external oblique	Good	25	100.0%	16	64.0%	10.97 (0.001)**
	Weak	0	0.0%	9	36.0%	

Table 6: Comparison of the mean size of defect, post-operative pain between the groups using t-test

	Desarda Repair		Lichtenstein repair		t-test (p-value)
	Mean	SD	Mean	SD	
Size of defect	2.0	0.35	2.2	0.6	0.155
Postoperative pain at 6hrs	3.8	0.8	5.2	1.1	0.001**
Postoperative pain at 12hrs	1.6	.5	2.4	.8	0.001**

Table 7: Showing the post-operative complications between the groups

		Desarda Repair		Lichtenstein repair	
		Count	Column N%	Count	Column N%
Post-op complications	NIL	25	100.0%	25	100.0%

Table 8: Comparison of the duration of hospital stay and days to resume to work between group using t-test

	Desarda Repair		Lichtenstein repair		t-test (p-value)
	Mean	SD	Mean	SD	
Duration of hospital stay	3.3	0.5	3.9	0.7	0.001**
Day of resuming to work	11.0	1.0	12.8	1.4	0.001**

5. Discussion

This present prospective comparative study was conducted among the patients above 18 yrs of age getting admitted to hospital with diagnosis of uncomplicated inguinal hernia included after obtaining the informed consent. The overall mean age of all the patients included in the study was found to be 50.32 ± 13.67 yrs of age. The mean age of patients in LR was 51.8 ± 14 yrs and in DR it was 48.9 ± 13.5 yrs of age. ($p > 0.05$) The diagnosis among the patients, 60% of the patients presented with right inguinal hernia and 40% with left inguinal hernia. In study by Akhtar *et al.*, the mean age of patients in Desarda repair was 44.63 yrs and in LR group it was 45.3 yrs of age [10]. Duration of

the surgery, there was significant lower duration of surgical time in Desarda repair (48.2 ± 7.62 mins) compared to Lichtenstein repair (87.4 ± 7.37 mins) ($p < 0.05$).

The cost of procedure among the DR group was lower than in the LR group (approximately 3000 and 5000 INR respectively). In study by Akhtar MS *et al.*, the operative time was significantly lower in the Desarda technique (26.91 ± 5.82 min) compared to the Lichtenstein group (36.07 ± 8.06 min) [10]. In study by Arafa AS *et al.*, found that the Desarda repair had the shorter operating time and patients returned to normal gait early. The complication was nearly same in both the study arms [11]. In study by Vupputuri H *et al.*, there was a significant higher

surgical time in Lichtenstein mesh repair group and with higher post-operative pain in them compared to Desarda repair non-mesh group. However the complications were comparable between the groups [12]. In contrast, study by Rofriguez PR *et al.*, surgery time in the Desarda group was 51 minutes and 40 minutes in the Lichtenstein group, which is significant ($p < 0.05$) [13].

On assessment of post operative period, the post operative complications, chronic pain, foreign body reaction and mesh rejection or infection were no seen in both the study groups. The foreign body sensation was seen higher incidence in the LR group (40%), compared to the DR group. ($p < 0.05$) In study by Vupputuri H *et al.*, documented the chronic pain in groin region was significantly higher among the patients underwent the Desarda non-mesh repair [12]. The strength of external oblique on assessment, there was higher incidence of the weakness among the LR group (36%) compared to the patients in DR group with good strength of external oblique among all the patients.

On assessment of the post-operative pain among the patients, we found a significant higher pain score among the patients of LR group at 6hr (5.2 ± 1.1) and 12hr (2.4 ± 0.8), compared to DR group at 6hr (3.8 ± 0.8) and 12hr (1.6 ± 0.5). ($p < 0.05$) In study by Zahra SH *et al.*, documented a lower post-operative pain among the Desarda procedure compared to Lichtenstein however it was insignificant in their study [14]. In study Akhtar MS *et al.*, post-operative pain score was higher in Desarda technique. However, the physical activity, pain, seroma formation and foreign body sensation were lower in the Desarda technique. The pain reported via the VAS score on 1st post-operative day was 3.64 ± 0.60 in the Desarda group while it was 3.43 ± 0.86 in the Lichtenstein group. The mean VAS score for pain on 7th post-operative day was 1.36 ± 0.49 in the Desarda group while it was 1.24 ± 0.43 in the Lichtenstein group. There was no statistically significant difference between the Desarda and Lichtenstein group in regard to pain reported via the mean VAS score [10].

Similar to present study, Rofriguez *et al.*, documented average time to return to work in the Desarda group was 8.26 days, whereas the Lichtenstein group took 12.58 days [13].

In study by Mohamedahmed A *et al.*, documented DT and LT were found to have the comparable results in terms of recurrence rate, hematoma, atrophy of testis and time to return to the normal daily activity [15].

On assessment of the total duration of hospital stay and day to resume for work, we found that the DR group was better than LR group. The duration of hospital stay among the DR group (3.3 ± 0.5 days) was significantly lower than in LR group (3.9 ± 0.7 days), ($p < 0.05$) similarly the number of days to resume to work was significantly lower in DR group (11 ± 1.0 days) compared to LR group (12.8 ± 1.4 days). ($p < 0.05$) In line with present study, Zahra SH *et al.*, the time to require to start normal activity was assessed and it was statistically lower in Desarda technique and Desarda repair is better than Lichtenstein repair in terms of operative time and return to normal activity. [14] Found a significant higher pain score among the patients of LR group at 6hr (5.2 ± 1.1) and 12hr (2.4 ± 0.8), compared to DR group at 6hr (3.8 ± 0.8) and 12hr (1.6 ± 0.5). ($p < 0.05$).

Number of days to resume to work was significantly lower in DR group (11 ± 1.0 days) compared to LR group (12.8 ± 1.4 days). ($p < 0.05$)

6. Conclusion

Present study documented a shorter operating time, early discharge and return to work among the patients underwent Desarda repair compared to the Lichtenstein repair. The post

operative time and cost of surgery was found to be lower among the Desarda repair. The complications and recurrence were minimal among both the groups with comparable result. The present study states, Desarda repair as a better alternative for the Lichtenstein repair for hernia among the patients.

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