



## Original Article

# Lichtenstein Versus Desarda's Technique of Hernia Repair

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### ABSTRACT

**Aim:** To compare Desarda's versus Lichtenstein's mesh repair in patients with unilateral, primary, reducible inguinal hernia in terms of mean operative time and seroma formation

**Methods:** This randomized control trial conducted at Department of Surgery, Patuakhali Medical College & Hospital, Patuakhali. Eighty patients with unilateral, primary, reducible inguinal hernia were randomly distributed into two groups to undergo hernia repair i.e. Lichtenstein (L) and Desarda's (D). Outcome was measured in terms of mean operative time and seroma formation. Seroma formation was defined as presence of enclosed cavity containing serous fluid determined by ultrasonography at 30<sup>th</sup> post-operative day.

**Results:** Thirty three patients (41.25%) were above 50 years of age, whereas remaining 47 patients (58.75%) were below 50 years of age. Five patients (6.25%) were female and 75 patients (93.75%) were male. Seroma formation was 5% in Desarda's group while 7.5% in Lichtenstein group ( $P > 0.05$ ). Similarly difference in mean operative time was statistically non-significant. Seroma formation was common in older age group. There was no effect of smoking, obesity, operative time and gender on seroma formation.

**Conclusion:** It is concluded that there is no difference in frequency of seroma formation and mean operative time in Desarda's or Lichtenstein's technique of hernia repair.

**Key words:** Inguinal hernia, Lichtenstein repair, Desarda's group, Seroma formation

### Introduction

Inguinal hernia is the most common types of hernia in the world<sup>1-3</sup>. Lifetime risk for inguinal hernia is 27% for men and 3% for women<sup>4</sup>. Annual morbidity rates in various countries vary from 100 to 300 per 1,00,000

people. Inguinal hernia repair is one of the commonest operations done by a surgeon and methods depends on him as there were no written surgical guideline<sup>5-7</sup>. The ideal method for modern hernia surgery should be simple, cost effective, safe, tension free and permanent. The Lichtenstein mesh repair achieves all these goals in great extent<sup>8</sup>. But due to high initial cost and non-availability in district sadar hospital, this procedure is gradually reduced in secondary health care centre. The synthetic prostheses can create new clinical problems, such as foreign body sensation in the groin, discomfort, and abdominal wall stiffness, which may affect the everyday functioning of the patient<sup>4</sup>. Surgical-site infections, often with clinical symptoms delayed for many years, are more frequent after hernia treatment using mesh<sup>5-6</sup>. Migration of the mesh from the primary site of implantation is one of the most dangerous complications<sup>7-9</sup>. Intense chronic

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inflammatory process typically associated with foreign body reactions around the mesh prosthesis may produce meshoma or plugoma, the treatment of which becomes a new surgical challenge<sup>10-12</sup>. Additionally, procreation and sexual function are seriously affected after surgical hernia treatment with mesh<sup>8,13</sup>. Thus, we are still far from accomplishing everything in the hernia surgical field, and complications remain the major clinical problem.

The observed complication rates and postoperative dysfunction have influenced many investigators to look for new hernia repair techniques or to modify old ones. An example of such efforts is the Desarda method, which was presented in 2001 and became a new surgical option for tissue-based groin hernia repair<sup>14-15</sup>. Because the results of our prospective study involving the technique were promising, as were the results presented by other authors<sup>16-17</sup>. We performed a randomized double-blind clinical trial to compare the standard mesh-based Lichtenstein technique with the tissue-based Desarda technique.

Rationale of current study is that there is no local study available comparing the mesh and non-mesh hernia repair in last five years<sup>1-3</sup>. Available international data is scarce. One available RCT found equal rate of complications while other proved increased seroma formation in Lichtenstein group<sup>9,10</sup>. Current study will help find an evidence for better and cost effective technique in terms of mean operative time and seroma formation.

### Materials and Methods

This randomized control trial was carried out in Department of Surgery, Patuakhali Medical College & Hospital, Patuakhali from 1<sup>st</sup> January, 2017 to 31<sup>st</sup> December, 2017 (1 year). Eighty patients with unilateral, primary, reducible inguinal hernia determined by clinical examination. Duration of the repair was started at the beginning of a particular repair technique after herniotomy had been performed, and ends when the last stitch of the repair is knotted, before closing the other layers of the wound. It was recorded in minutes. Seroma formation was defined as presence of enclosed cavity containing serous fluid determined by ultrasonography at 30<sup>th</sup> post-operative day. Patients with renal failure (serum creatinine more than 2mg/dl) and diabetes were excluded. After approval from ethical review board, 80 patients admitted for unilateral, primary, reducible inguinal hernia were evaluated by consultant, and the patients fulfilling the

inclusion criteria were included in the study after taking the informed consent. All the operations were carried out by researcher on operative list under spinal anesthesia. Included patients were randomly divided into two groups using random table i.e., one group in which hernia was repaired by standard mesh (Lichtenstein) and second group by Desarda's method. Data of all patients was collected on a structured questionnaire regarding outcome (mean operative time and seroma formation) according to operational definitions along with age, gender and history of current smoking and body mass index. Each patient was followed by ultrasonography on post-operative day 30 for presence of seroma. Body mass index > 30kg/m<sup>2</sup> and history of smoking was taken as effect modifier and data was stratified accordingly. All the data from the proforma was entered and analyzed in the SPSS version 22. The descriptive statistics like age and operative time were presented in the form of mean±standard deviation while sex, smoking history, body mass index >30kg/m<sup>2</sup> and seroma formation as frequency and percentage. The mean difference between mean operative time was determined using Student t-test while post stratification significance and difference in seroma formation was determined by chi square test. A value of P≤0.05 was considered as significant.

### Treatment

In this study, 80 patients were randomly assigned to the D (Desarda) or L (mesh-based Lichtenstein) group.

1. The Lichtenstein tension-free mesh repair was performed as described by Berguer<sup>17</sup>. An 8 × 12 cm polypropylene mesh (Prolene; Ethicon, Somerville, NJ, USA) was trimmed to a foot-like shape to fit the floor of inguinal canal. The mesh was sutured to the ligament of Poupart using a nonabsorbable continuous 3/0 suture (Prolene; Ethicon) and secured cranially using an absorbable 3/0 suture (Vicryl; Covidien, Mansfield, MA, USA). The Desarda repair was performed as it was originally described in 2001<sup>14-15</sup>. Continuous nonabsorbable suture (3/0 Prolene; Ethicon) was used to secure the aponeurotic strip to the inguinal ligament laterally, and the strip was secured to the internal oblique muscle medially with interrupted, absorbable sutures (3/0 Vicryl; Covidien). Particular attention was paid to identify and preserve the nerves of the inguinal canal. All intraoperative variables were recorded

and compared. After the inguinal canal had been opened, the hernias were described using the Gilbert-modified Robbins–Rutkow classification system as follows: type 1, indirect hernia with normal deep ring; type 2, indirect hernia with deep ring enlarged but <4 cm; type 3, indirect hernia with deep ring enlarged >4 cm; type 4, direct hernia with destroyed posterior wall of the inguinal canal; type 5, direct hernia with defect next to the pubic tubercle; type 6, pantaloon hernia; type 7, femoral hernia. For both techniques, the skin was closed with continuous/interrupted non-absorbable suture. Patients were encouraged to resume normal activities as soon as possible.

- Desarda's method: External oblique aponeurosis was incised along fibre direction. Lower lip should be freed from underlying structure. Upper lip margin is sutured continuously with inguinal ligament. Tense upper lip is incised along fibre direction 1.25 cm proximal and parallel to lower lip margin. Lower margin of upper lip is sutured continuously with conjoint tendon by 3-0 Prolene.

### Follow-up

Patients were examined by a blinded investigator until discharge and seen during follow-up appointments at 7 and 30 days after surgery. The appointments on day 7 were performed during the patients' visits to outpatient surgical departments; and the follow-up appointments after day 7 were performed in the departments' examination rooms. Both the patients and controlling investigators were blinded to the hernia surgery method used. The investigator who was performing the follow-up physical examinations and patient assessments was a surgeon in each department who did not perform the surgeries in this study.

Recurrences and other complications were recorded. Pain was measured using a visual analog scale (VAS), which ranged from 0 (no pain) to 100 (maximum, unbearable pain). Additionally, pain was recorded with the use of the Sheffield scale: 0, no pain; 1, no pain at rest but it appears during movement; 2, temporary pain at rest and moderate during movement; 3, constant pain at rest and severe during movements. Return to normal activity was described as the patient's ability to perform elementary activities [i.e., dressing, walking, bathing (basic activity)]; usual activities at home (i.e., preparing food, cleaning house); and returning to all previously performed activities (work activity).

### Outcomes

The aim of the present study was to test the hypothesis that the Desarda repair is as effective as the standard Lichtenstein procedure, allowing successful hernia repair without mesh. The primary outcomes were hernia recurrence and chronic pain, defined as moderate (VAS 30–54) or strong (VAS > 54) pain lasting more than 1 months after surgery. The secondary outcomes were general and local complications, length of time to return to various levels of everyday activity, foreign body sensation, and abdominal wall stiffness in the groin area.

### Results

Eighty patients were included in our sampled population with mean age distribution  $52.20 \pm 6.75$  ranged from 32 to 60 years. Thirty three patients (41.25%) were either 50 years of age or above whereas remaining 47 patients (58.75%) were below 50 years of age. Five patients (6.25%) were female and 75 patients (93.75%) were male. Five patients (6.25%) were presented with seroma formation whereas 75 patients (93.75%) showed negative results. Operative time in 34 patients (42.5%) was less than 25 minutes whereas in 46 patients (57.5%) operative time was either 25 minutes or more. Mean operative time was  $27.80 \pm 5.65$  minutes (Table 1). When we cross tabulated treatment group with seroma formation, results were non-significant ( $p=0.295$ ). Two patients of Desarda's group developed seroma formation and 3 patients of Lichtenstein group showed similar results (Table 2). Eighty patients had statistically equally distributed mean operative time in Lichtenstein and Desarda groups was not significant [ $P>0.05$ ] (Table 3). When we cross tabulated treatment group with operative time, in Desarda's technique 16 patients took less than 25 minutes while 24 patients took more time. Lichtenstein technique almost followed the same trend. Statistically results were non-significant [ $p=0.86$ ] (Table 4).

**Table 1.** Descriptive statistics of the patients (n=80)

Variable	No.	%
Gender		
Male	75	93.75
Female	5	6.25
Seroma formation		
Yes	5	6.25
No	75	93.75
Age (years)	$52.20 \pm 6.75$	
Operative time (minutes)	$27.80 \pm 5.65$	

**Table 2.** Cross tabulation between group and seroma formation

Group	Seroma Formation		P value
	Yes	No	
Desarda's	2(5%)	38	0.295
Lichtenstein	3(7.5%)	37	(Non-significant)

**Table 3.** Mean distribution by operative time in treatment groups

Group	Operative time	P value
	(Minutes)	
Desarda's	27.90±5.70	0.87
Lichtenstein	27.70±5.60	(Non-significant)

**Table 4.** Cross tabulation between group and operative time

Group	Operative time		P value
	Less than 25 minutes	25 minutes and more	
	Desarda's	16	
Lichtenstein	18	22	(Non-significant)

### Discussion

In our study, 5 patients (6.25%) developed seroma whereas 75 patients (93.75%) showed negative results. When we cross tabulated treatment group with seroma formation, results were non-significant ( $p=0.295$ ). 2 patients of Desarda's group (5%) developed seroma while 3 patients of Lichtenstein group (7.5%) had seroma at end of study period. Our results are different from previous studies<sup>11-14</sup>.

In the previous study, there was significantly less seroma production in the Desarda's group at 30<sup>th</sup> day (0% vs. 7.8%) ( $p=0.004$ )<sup>9</sup>. The difference in results may be secondary to difference in demographic profile of included patients. Similarly in our study, mean operative time was equally distributed in both Lichtenstein and Desarda groups. When we cross tabulated treatment group with operative time, in Desarda's technique 16 patients took less than 25 minutes while 24 patients took more time. Lichtenstein technique almost followed the same trend. Results were non-significant ( $p=0.86$ ).

In another study a significant difference was recorded in regard to operative time- with the Desarda's repair taking a remarkably shorter duration;  $15.9\pm 3.52$  minutes for Lichtenstein repair and  $10.02\pm 2.93$  minutes for Desarda's repair, effect size (95% CI): 5.92 (4.62–7.20),  $P=0.0001$ . There was no significant difference in complication rate in both groups (intraoperative complications in Desarda vs Lichenstein are 4.00% vs 1.96% ( $p=0.6710$ ), postoperative 10% vs 13.70% ( $p=0.564$ ), postoperative day 14 13.7% vs 14% ( $p=0.1$ )<sup>10</sup>. Seroma formation was common in older age group. There was no effect of smoking, obesity, gender and operative time on seroma formation.

### Conclusion

It is concluded that there is no difference in frequency of seroma formation and mean operative time in Desarda's or Lichtenstein's technique of hernia repair. So we accept the null hypothesis and include the Desarda's repair of primary reducible inguinal hernia has equal mean operative time and frequency of seroma formation as compared with Lichtenstein's.

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