



## COMPARATIVE STUDY OF TISSUE REPAIR DESARDA TECHNIQUE VERSUS LICHTENSTEIN'S MESH REPAIR IN INGUINAL HERNIA

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**ABSTRACT** **Introduction:** In 2001, Dr. Mohan P Desarda introduced a novel technique of tissue-based hernia repair with 0 % recurrence rate. The aim of this prospective randomized clinical study was to compare the clinical outcomes of the mesh-based Lichtenstein method with tissue-based Desarda method for the treatment of primary inguinal hernia.

**Patients and methods:** This prospective randomized study included forty males with primary inguinal hernia, with 20 patients each in Lichtenstein and Desarda groups. The patients were followed-up in terms of mean operative time, time taken for return to normal gait, post-operative complications, chronic groin pain and cost effectiveness.

**Observations and results:** Both the groups were comparable in terms of patient demographics. Operative time and postoperative pain were significantly less in Desarda group. There was no statistical difference in post-operative complication rate within 12 months of follow-up period even though less number of complications was encountered in the Desarda group.

**Conclusion:** Postoperative pain, mean operating time, painless ambulatory time was better in case of Desarda technique.

**KEYWORDS :** Inguinal hernia, Lichtenstein repair, Desarda repair, Lichtenstein versus Desarda.

### Introduction

The surgical treatment of inguinal hernias has evolved through several stages to reach a modern and successful era. Hernia repair is one of the most commonly performed general surgical procedures worldwide [1]. Since the time Bassini described his technique, the search for an ideal inguinal hernia repair is still on [1]. An ideal hernia repair should be tension free, tissue based, with no potential damage to vital structures, no long term pain or complications including recurrence. Though Lichtenstein's prosthetic repair using polypropylene mesh has been popular, lately it is not a tissue based repair and hence cannot be considered ideal. It does not give mobile and physiologically dynamic posterior wall [2]. Moreover this technique is associated with chronic pain, testicular atrophy and infertility [3]. Shouldice method which closely compares with the mesh repair is rarely used probably because of the complexity involved in tissue dissection and repair [4]. Suture repair for inguinal hernia is still under development. Professor Mohan P. Desarda from Pune, India has described a new technique that is theoretically closer to ideal hernia repair. His technique is based on the concept of providing a strong, mobile and physiologically dynamic posterior inguinal wall with superior results [5-7].

The purpose of this study is to compare this new technique with respect to Lichtenstein mesh repair in terms of early clinical outcomes of inguinal hernia repair and short term outcomes for a period of 1 year.

### Patients and methods

The present study was a single-center, randomized study. It was conducted on patients admitted with the diagnosis of primary inguinal hernia (direct, indirect and pantaloon) in Mamata General Hospital from October 2015 to March 2017. A total of 40 patients were studied with 20 patients randomly allocated to Lichtenstein repair group and other 20 patients to Desarda repair group. Institutional ethical committee approval and informed consent from patient were taken before start of the study.

The diagnosis of primary inguinal hernia was made on basis of history and clinical examination. Routine investigations were done which were relevant to obtain fitness for surgery. The patients were subjected to either Lichtenstein or Desarda method of hernia repair after taking written consent to participate in the study. Patients were randomized by using envelope method after opening the external oblique

aponeurosis. Males above 20 years of age, patients with uncomplicated, primary, unilateral, medial or lateral hernias classified according to "The European Hernia Society groin hernia classification" were included in the study. Patients unfit for surgery; patients with strangulated hernia or recurrent hernia or bilateral hernias, per-operative finding of separated, thin and/or weak external oblique aponeurosis (not suitable for Desarda's procedure), old and debilitated patients of poor general condition were excluded from the study.

All patients underwent procedures under spinal anesthesia. In Lichtenstein's hernioplasty, a 3 inch x 6 inch polypropylene mesh made by same company (SUTURES INDIA INC.) was used in all cases. The mesh was 0.5 mm thick and has burst strength of approximately 14 kg/cm<sup>2</sup>. In Desarda repair, an un-detached strip of the external oblique aponeurosis (EOA) is sutured to the inguinal ligament below and the muscle arch above, behind the cord, to form a new posterior wall. Operative technique was decided based on strength of external oblique aponeurosis intraoperatively. All the patients were followed up for a period of 1 year.

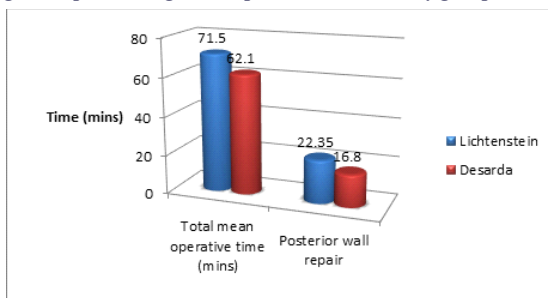
**Statistical Analysis:** Paired T test for quantitative data and Pearson chi-square test for qualitative data were used to evaluate the P value. Differences were considered statistically significant, if  $P < 0.05$ . IBM SPSS Statistics for Windows, version 24 (IBM Corp., Armonk, N.Y., USA) software program was used for statistical calculations.

### Observations and Results:

There was no significant difference in terms of age, type of hernia, EHS grade in both the groups (Table: 1). Mean operative time taken for total surgery in Desarda group was significantly shorter when compared to Lichtenstein group. Mean operative time for posterior wall repair alone in case of Desarda group was significantly shorter when compared to Lichtenstein group (Fig. 1). Mean visual analog scale (VAS) scores were significantly lower on postoperative days 3, 5 and 7 in Desarda group. Early complication rate was not statistically significant. Average cost of treatment in Lichtenstein group was ₹3930 whereas in Desarda group, it was ₹2560. This difference was attributed to the mesh cost and additional suture requirement in Lichtenstein group.

**Table 1: Demographic profile in both groups**

Variable		Lichtenstein	Desarda	P value (Paired T test)
Mean age (years)		46.9±17.11	40.27±15.22	0.15
Side distribution	Right	12 (60%)	13 (65%)	0.149
	Left	08 (40%)	07 (35%)	
Type of hernia	Indirect	13 (65%)	15 (75%)	0.465
	Direct	07 (35%)	04 (20%)	
	Combined	00	01 (5%)	
EHS grade	Lateral	Grade I	12 (60%)	15 (75%)
		Grade II	02 (10%)	01 (5%)
		Grade III	00	00
	Medial	Grade I	04 (20%)	01 (5%)
		Grade II	02 (10%)	03 (15%)
		Grade III	00	00

**Fig. 1 Graph showing Mean operative time in study groups**

Chronic groin pain was seen in 2 participants (10%) in Lichtenstein group, whereas in Desarda group none of the participants had chronic groin pain. However chronic groin pain in both the participants in Lichtenstein group lasted for a duration of 1 year. This difference in complication rates in both the groups was statistically insignificant with a P value of 0.24 (Table 2). No recurrence was observed in either group in the present study owing to the shorter follow up period of 12 months.

**Table 2: Comparison of variables studied**

Variable		Lichtenstein	Desarda	P value (Paired T test)
VAS scores	POD 1	5.98 ± 0.91	5.84 ± 0.84	0.565
	POD 3	4.59 ± 0.81	3.42 ± 0.82	0.001*
	POD 5	2.6 ± 0.78	1.93 ± 1.1	0.02*
	POD 7	1.85 ± 0.89	1.07 ± 1.11	0.03*
Mean pain free ambulation time (Days)		5.05 ± 1.79	3.9 ± 1.58	0.048*
Average cost (₹)		3930 ± 446	2560 ± 393	0.001*
Early complications	Nerve injury	00	00	0.4 (Pearson chi-square test)
	Hematoma	00	00	
	Seroma	02 (10%)	01 (5%)	
	Testicular oedema	04 (20%)	02 (10%)	
Late complications	Foreign body sensation	02 (10%)	00	0.47 (Pearson chi-square test)
	Change / loss of groin sensation	01 (05%)	01 (05%)	
	Chronic groin pain	02 (10%)	00	
	Recurrence	00	00	

\*Significant

## Discussion

The estimated lifetime risk for inguinal hernia is 27% for men and 3% for women (Primatesta And Goldacre, 1996) [8]. In the EHS guidelines, mesh-based techniques—the Lichtenstein technique in particular—and endoscopic methods are recommended for treatment of symptomatic primary inguinal hernia in adult men. In a departure from this firm opinion presented by the EHS, the Shouldice method has been acknowledged to be acceptable as well (Simons et al, 2009) [9].

The synthetic prostheses most often used in the inguinal area 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 (D'Amore et al, 2008) [10]. 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 [11, 12].

In the present study, there was no significant difference observed between the patient demographics in both groups. There was no recurrence observed in both the groups during the 1 year follow up period. The total duration for surgery was 71.5 and 62.1 minutes in Lichtenstein and Desarda groups respectively. This correlates with the study by R Shah [13]. Total duration of the surgery may be variable because of the difficulty associated in dissection of hernial sac, time taken for securing adequate hemostasis and surgeon's experience. To avoid all these confounding factors, actual time taken for posterior wall repair alone was also noted in the present study. In the present study, mean operative time taken for repair of posterior wall repair alone was shorter in Desarda group which correlates with the study by Manyilira [14]. Postoperative pain was assessed by using visual analogue scale in the present study. Participants in Desarda group experienced significantly less pain on POD 3, 5 and 7. This correlates with other studies [8, 13-15]. The participants in the Desarda group returned to normal gait earlier than those in the Lichtenstein group which is similar to other studies [8, 13, 14, 16].

In the present study, the early complication rate was 30% in Lichtenstein group and 15% in Desarda group which was statistically insignificant. The reported incidence in the present study was higher, when compared to other studies [8, 14, 15, 17]. This may be due to the small sample size included in the study. Majority of the complications in this study were managed conservatively.

Paradoxically, in the modern world the cost of the medical treatment becomes the real issue. The cost of inguinal hernia treatment, a tiny fraction of all health expenses, is significant, especially in developing countries in Asia or Africa. One indisputable advantage of Desarda technique is its low cost.

Complications occurring one month following surgery were considered as late complications in various studies [8, 18]. The original logic behind using a mesh was very simple: the mesh was a material which could be used to reinforce the abdominal wall with the formation of scar tissue due to fibrosis. Unfortunately, this fibrotic reaction led to pain with movement restriction and it soon became clear that this needed to be minimized. In the present study, 10 % of the participants in Lichtenstein group had chronic groin pain, whereas none of the participants had chronic groin pain in Desarda group. Similar observations were made in various studies [8, 16, 18-20] suggesting that Lichtenstein mesh repair is associated with more incidence of chronic groin pain when compared to Desarda repair. We acknowledge the drawback of the study with small sample size and short follow up period of 1 year.

## Conclusion

Desarda repair is a cost effective technique with significantly lower total operative time, post operative pain, post-operative ambulatory time and post operative complications. Studies with larger sample size and long term follow-up are required for the incorporation of Desarda technique into present hernia repair techniques.

Conflicts of interest: Authors declare that they have no conflict of interest.

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