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**General Surgery** 

## A COMPARATIVE STUDY OF DESARDA VS LICHTENSTEIN REPAIR FOR UNCOMPLICATED INGUINAL HERNIA REPAIR IN A RURAL MEDICAL COLLEGE & HOSPITAL

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ABSTRACT BACKGROUND: Inguinal hernias rank among the commonest of all hernias and surgery is the only definitive treatment. We analysed the outcomes of Desarda tissue based repair in comparison with the standard Lichtenstein tension free mesh repair of primary inguinal hernia.

**METHODS**: A total of 100 patients were randomly allocated into two groups, Desarda (group D) or Lichtenstein (group L) (50 VS 50, respectively). The primary outcome measures were operating time, post-operative pain scores, duration of post-operative hospital stay, time to return to basic physical activity and to work, foreign body sensation, and post- operative complications like seroma, haematoma, wound infection. Secondary outcome measures included chronic groin pain and recurrence during the follow up period.

**RESULTS**: Operative time was significantly less in the Desarda group  $(24.3400 \pm 5.6518)$  min as compared to  $(30.5200 \pm 7.6405)$  min in the Lichtenstein group. Postoperative day 1, day 3 and day 7 operative site pain was more in the Lichtenstein as compared to the Desarda group. Basic physical activity( post operative ambulation), chronic groin pain, seroma formation, haematoma formation, foreign body sensation, were also significantly less in the Desarda group. During 3month follow up, 1 recurrence was detected in each group

**CONCLUSIONS:** The successful primary inguinal hernia repair without use of mesh can be achieved using Desarda tissue based repair. It is as effective as the standard Lichtenstein tension free mesh repair. Shorter operative time, early return to basic physical activity, less chronic groin pain, less foreign body sensation and low postoperative complication are potential benefits of Desarda repair and can be preferred for primary inguinal hernia repair.

KEYWORDS : Inguinal hernia, Chronic groin pain, Desarda repair, Lichtenstein repair, Recurrence.

## **INTRODUCTION:-**

A number of procedures for repair of inguinal hernias have been described in literature till date. Both open and laparoscopic procedures with or without the use of mesh is being followed by various surgeons worldwide.

Consensus on international guidelines for management of groin hernia recommends Lichtensteins mesh repair as the preferred technique for inguinal hernia repair, Followed by Shouldice technique for non mesh repair. Lichtenstein repair which has been its described in 1884 has a documented recurrence of 1% in specialised centres and overall 4% world wide<sup>7</sup>. Other limitations and complications of mesh repair include, foreign body sensation, groin discomfort, abdominal wall stiffness leading to delay in resuming normal activity. Also some mesh related complications. Like mesh migration, rolling or folding of mesh, implantation on peritoneal surface, urinary bladder, femoral vein have been reported.

In 2001, Dr. M. Desarda reported a new technique of tissue based inguinal hernia repair technique in which tension free repair of the posterior wall is done by a strip of external oblique aponeurosis, that is placed on the posterior wall on the transversalis fascia and Hesselbach's triangle as a graft, and the strip of muscle act as a pulley to counteract the abdominal pressure, at the time of straining or any increased intra-abdominal pressure<sup>8,10</sup>. No prosthesis is used, and the external oblique tendinous end is used for strengthening of the posterior wall, requires no complicated dissection or suturing and is easy to learn.

The aim of this prospective randomised clinical study is to compare the clinical outcomes of the tissue-based Desarda method with the standard open mesh-based Lichtenstein method for the treatment of primary inguinal hernia among adult Indian people.

## **METHODS:-**

This prospective randomised clinical study was conducted at department of general surgery Midnapore medical college and hospital, Midnapore west, January 2019 to June 2020, after approval from the institutional ethical committee. Obtaining written and informed consent from all patients was included in the study after detailed explanation of the purpose of the study.

## Inclusion Criteria:

All male patients between 18 years and 75 years of age with primary unilateral or bilateral inguinal or inguino-scrotal hernia were included for the study.

## Exclusion Criteria:

- 1. Strangulated or obstructed inguinal hernia
- 2. Recurrent hernias.
- 3. Intraoperative splitting in external oblique aponeurosis.
- 4. Female sex.
- Patients not fit for surgery (ASA grade III and above), immunocompromised patients, , patients with uncontrolled DM, chronic cough, uncontrolled HTN,
- 6. Chronic straining factors(COPD, obstructive uropathy, bronchial asthma).

After proper informed consent, all the patients were randomly allocated to either DESARDA GROUP { group D}or LICHTENSTEIN GROUP { group L}. Randomisation was achieved using computer generated allotment and disclosed to the surgeon using a sealed envelope method. All cases were electively done under spinal anaesthesia after single dose of preoperative intravenous Injection Amoxicillin-Clavulanate (1.2g).

In Desarda's technique, after dissection of the sac has been completed, the edge of the medial leaf of external oblique aponeurosis is sutured to the inguinal ligament with a continuous 2-0 polypropylene suture from pubic tubercle to deep ring. External oblique is incised 1.5 cm above the suture line thus creating a strip that remains non detached from the aponeurosis. The upper margin of the strip is sutured to the conjoint tendon/ muscle, using running 2-0 polypropylene suture. The spermatic cord is placed in the inguinal canal, and edges of external oblique aponeurosis are approximated.

Patients undergoing Lichtenstein's mesh repair group L, the standard Lichtenstein technique was followed using a sheet of polypropylene mesh  $(11 \times 6 \text{ cm})$ .

In postoperative period, Diclofenac sodium 75mg i.m. inj. for one day postoperatively then oral NSAIDs for next 3 days were given for pain relief for all patients. Mobilisation was encouraged as early as possible. Early postoperative data regarding complication was collected on 1<sup>st</sup>, 3<sup>rd</sup>, 7<sup>th</sup> and 30<sup>th</sup> post-operative day by through examination . Patients were followed up at 1 month, 2 month and 3 month post operatively and any recurrence of hemia (apparent swelling / gap at the same site of operation) or any other complications were noted. All recorded data were analysed by IBM SPSS version 20 (SPSS Inc., Armonk, NY), with suitable diagrams, figures, tables. For continuous variables, mean and standard deviation were calculated. Comparison of outcomes was performed by Chi square test. P<0.05 was considered as statistically significant.

#### Study design:-



Extent	Complet	e-16			
Examination of	Prostatomegaly -9		No Prostatomegaly -		
prostrate			91		
Intra-operative events					
Condition of extern	Thinned	d out - 7	Healthy - 93		
Intra operative nerve injury		Nerve	injury	Nerve injury	
		prese	nt - 12	absent - 88	

COMPABABLE VABIABLES		
VARIABLES	DESARDA	LICHTENSTEIN
Mean operation time	24.3400 ± 5.6518 minuters	30.5200 ± 7.6405 minutes
Requirement of analgesics	18	35
Mean Post op Day of ambulation	1.5 days	2.04 days
Scrotal oedema	7	14
Seroma formation	8	20
Hematoma formation	5	15
Wound infection	2	6
Mean post op stay	1.12 days	2.78 days
Chronic groin pain	6	20
Foreign body sensation	10	42
Resume of normal work > 30 days	7	15
Recurrence	1	1

#### Result Analysis :-

In our study 18% patients belong to the age group 18-25 years, 46 % patients belongs to age group 26-50 years and 36% patients belongs to age group > 50 years. Mean operative duration (mean  $\pm$  SD) in Desarda group is 24.3400  $\pm$  5.6518 minutes and in Lichtenstein group is 30.5200  $\pm$  7.6405 minutes having a P value of <0.0001, means that Desarda procedure would require a lesser operating time which indicates that it is a simpler procedure and can be easily adapted by most resident surgeons.

Table: Difference of mean Value Group



Patients having pain in visual analogue scale >5 considered as candidates who require injectable analgesics .35% patients requiring analgesics beyond POD-1 belongs to Lichtenstein group and 18% patients requiring analgesics beyond POD-1 belongs to Desarda group, with a P value of 0.0006 means that patients undergoing Desarda procedure had lesser requirements of analgesics as has been evaluated

# Table showing requirement of additional analgesics beyond POD-1

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Procedure	Analgesic required	Analgesic not required	P value
Lichtenstein	35	15	0.0006
Desarda	18	32	

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by our visual analogue scale.

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The post operative pain can have effect on the post operative ambulation. In Lichtenstein group on POD 1,2,3 the % of pt ambulated is - 10,28,12 where as in Desarda group the % of pt ambulated in POD 1,2,3 is 30, 15, 5. Mean ambulation time in Desarda group is 1.5 days whereas in Lichtenstein group it is 2.04 days with a P -value < 0.0001, which suggests that less pain needs less requirement of analgesics in Desarda group.

#### Table showing post-operative day of ambulation.

<b>D</b> 1				
Desarda	30	15	5	1.5 days
Lichtenstein	10	28	12	2.04 days
Procedure	POD-1	POD-2	POD-3	Mean
	-	_		



In Lichtenstein group the percentage of seroma and haematoma observed is 20% and 15% respectively and in Desarda group the percentage of seroma and haematoma observed is 8% and 5% respectively. The P value of these two variables are 0.0075 & 0.0124 for seroma and haematoma respectively which is statistically significant and denotes that the occurrence is less in Desarda group.

Table	showir	ıg post-	operative	seroma	and	haematoma
forma	tion					

Procedure	Seroma	Seroma	Haematoma	Haematoma
	present	absent	present	absent
Lichtenstein	20	30	15	35
Desarda	8	42	5	45
P value	0.0075		0.0124	



In the late post operative period 20% patients undergoing Lichtenstein and 6% under going Desarda procedure experience chronic groin pain, with a P value of 0.0014 which is statistically significant and depicts less occurrence in Desarda group. Like wise among the all patients operated total 52% experienced foreign body sensation amongst them 42% of Lichtenstein group and 10% of Desarda group, with a P Value of <0.0001, is statistically significant and shows less association with Desarda procedure.

Procedure	CHRONIC	CHRONIC	FOREIGN	FOREIGN	
	GROIN	GROIN	BODY	BODY	
	PAIN	PAIN	SENSATION	SENSATION	
	PRESENT	ABSENT	PRESENT	ABSENT	
Lichtenstein	20	30	42	8	
Desarda	6	44	10	40	
P value	0.0014		< 0.0001		
POST OPERATIVE CHRONIC GROIN PAIN AND FOREIGN-BODY					



In this study maximum patients of Desarda group resume normal work in <15 days where as maximum patients of Lichtenstein group resume normal activity in between 15-30 days , this difference has a P value of 0.0090 is statistically significant.

#### Table showing time taken to resume normal work.

Procedure	RESUME	RESUME	RESUME	Р
	NORMAL	NORMAL	NORMAL	value
	WORK <15	WORK 15 –	WORK > 30	
	DAYS	30 DAYS	DAYS	
Lichtenstein	10	25	15	0.0090
Desarda	25	18	7	



The wound infection in Lichtenstein group is 6% and that of 2% in Desarda group with a P value of 0.143 which is statistically not significant, hence depict no major difference. Like wise the scrotal oedema in Lichtenstein and Desarda group are 14% & 7% respectively, with a P value of 0.0856 which is also statistically not significant Mean post operative hospital stay in Desarda group is 2.12 days and in Lichtenstein group is 2.72 days having a P value of 0.8006. We did not find any difference in the duration of hospital stay of the patients in between the 2 groups. At the end of the study 2% patients had recurrence 1% from each group so there is no difference.

#### **DISCUSSION:-**

In our study majority of the patients belonged to middle age group (46% in age group 25-50). So we can easily presume that

the tissue strength for tissue repairs would be adequate. Except for few patients where the external oblique aponeurosis was either thinned out or split, majority of the patients were candidates for tissue repairs.

In this study mean of operative duration in group D is 24.3400  $\pm$  5.6518 minutes and in group L is 30.5200  $\pm$  7.6405 minutes, having a P value of <0.0001, meaning that Desarda procedure would require a lesser operating time which indicates procedural simplicity and adaptability by most resident surgeons. The results of Gedam et. Al., Ahmed et. al., Afzal et. al., Desarda et. al., Bhatti et. al. supported our study where as some studies like Rodriguez et.al., Zaheer abbas et.al. have shown some different results<sup>1,2,3,46</sup>. The longer operating time may be attributed to mesh tailoring and fixation of mesh with interrupted sutures. Patients undergoing Desarda procedure had statistically significant (p- 0.0006) lesser requirements of analgesics as has been evaluated by our visual analogue scale. Results of study by Gedam et. al. also supported our results<sup>1</sup>.

30% of study population which have undergone Desarda procedure ambulate on POD1, where as 28% who have undergone Lichtenstein procedure ambulate on POD2 with mean time for ambulation in both the procedure being 1.5 days in Desarda procedure and 2.04 days in Lichtenstein procedure . Study shows a P value of <0.0001 which is statistically significant , and supports the previous observation that of less need of analgesic and early mobilisation in Desarda procedure due to less incidence of pain.

Post operative seroma formation was significantly less in group D (P value of 0.0075) despite more dissection of plane above and below the external oblique in Desarda group. This might be because of foreign body reaction caused by mesh. Results of Szopinski et. al., Afzal et. al., Bhatti et. al. also shown similar outcome<sup>2.3.5</sup>. Like wise 15 % & 5% of study population showing post operative haematoma belong to Lichtenstein group and Desarda group respectively, with a P value of 0.0124 which is statistically significant. The cause may be some unnamed vessels at the conjoint tendon during fixation of mesh or over enthusiastic dissection. Similar results observed in Szopinski et. al<sup>3</sup>.

Post operative hospital stay in L group was significantly higher than D group suggesting less morbidity with Desarda procedure. The parent study conducted by Desarda et. al. found similar results<sup>6</sup>. Chronic groin pain was also higher in the L group. A mesh incites a severe foreign body reaction and fibrosis around it which might entrap the ilioinguinal nerve leading to chronic groin pain. Desarda et.al. observed similar results in their study but Szopinski et.al. did not find any difference in both the group. In our study we could follow up the patients up to 3 months after surgery. A study with a longer follow up period would probably evaluate the incidence of chronic groin pain better.

Foreign body sensation was significantly higher in the L group (P <0.0001). which is self explanatory as the mesh is a foreign body and it initiates reaction. The patients in Desarda group experienced lesser levels of pain and foreign sensation including abdominal wall stiffness which might have resulted in earlier resumption to normal activities in the D group (P-0.009). Similar results have been observed in Gedam et.al.,Afzal et.al. Ahmed et.al.,Desarda et.al. on the other hand Szopinski et.al. could not found any difference in both the groups<sup>1.34,5,6</sup>.

Our study did not reveal any difference in scrotal oedema, wound infection, mean hospital stay and recurrence rate. However Desarda et.al. could not fiund any recurrence in Desarda group<sup>6</sup> and Ahmed et.al. concluded that recurrence is lesser in Desarda group<sup>4</sup>. This is due to higher follow up period in these studies which could not be pursued due to time constrain.

Apart from the above findings we also made some additional observations. Our study was single blinded which might have been subject to selection bias. It was conducted in a rural medical college, which is a government institute, which provides free treatment to its patients. So the economic burden of the 2 different procedures could not be evaluated . However it can be easily extrapolated that a patient in a private setup would have to bear the additional cost of a mesh Desarda's repair like any other tissue repair can be performed in rural setups like ours , where the availability of mesh might be an issue. Also the applicability of such tissue repair in emergency setup would avoid dreaded complications like mesh infections and bowel fistulisation. Certain studies have found mesh migration and meshoma (mesh plug) in long term follow ups, which was not possible in our study. Few studies have even reported testicular atrophy and sexual impairment which was not evaluated in our study.



### CONCLUSSION:-

- Uncomplicated hernias mostly present in the 3<sup>rd</sup> to 5<sup>th</sup> decade. Most patients in this age group have intact external oblique aponeurosis, suitable for Desarda's tissue repair, except for those few who have a thinned out or split aponeurosis.
- This technique is one of the simplest tissue repair techniques which requires less time and expertise and can be performed in most rural setups, having less availability of mesh.
- Patients who undergo Desarda's repair experience lower levels of pain, lesser analgesic requirements and ambulate earlier.
- They experience less foreign body sensation, abdominal wall stiffness and lesser incidence of chronic groin pain than Lichtenstein repair because of nerve entrapment and fibrosis induced by the mesh. Chances of seroma and haematoma formation is also less.
- Therefore Desarda's repair significantly adds to the surgical armamentarium of tissue repair for uncomplicated inguinal hernias.

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