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Comparative Study between Desarda Repair and Lichtenstein's Tension Free Hernioplasty in the Management of Inguinal Hernias

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I. Introduction

Hernias may be generally defined as a "Abnormal Protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity'.

It has been said that the history of groin hernias is the history of surgery itself. The surgical treatment of inguinal hernias evolved through stages to reach modern and successful era. Hernia repair is one of the most commonly performed surgical procedures worldwide. An ideal inguinal hernia repair should be, tissue based tension free with no potential damage to vital structures, complications or no long term pain and no recurrenceses. Though lichenstein prosthetic repair using prolene mesh has being popular lately it is not a tissue based repair and hence cannot be ideal. Though this method of hernia repair is simple and safe, at the slightest moment of the mesh from the sutured area is leading cause of failure of inguinal hernias. Mesh works as a mechanical barrier. Moreover it is associated with chronic groin pain and testicular atrophy and infertility. Success of groin hernia is measured primarily by permanence of operation, minimal cost, fewest complications and earliest return to normal activities.

II. Aim and Objectives

1. Study the short term outcome with respect to:

- Post operative pain
- Operating time(incision to closure of skin)
- Duration of hospital stay
- Post op wound infection rate
- Return to normal activity-patients ability to perform elementary activities
- Cost of procedure in total

2. Recurrence rate

To look for any recurrence with regular follow ups at one month, three months, and six month

III. Materials And Methods

The present study was a single-center. Single-blind randomized, comparative two group surgical study. it compares between two surgical procedures namely Lichtenstein and Desarda's repair for inguinal hernia. It was conducted on patients admitted with the diagnosis of primary inguinal hernia (both direct and Indirect) in GRH MADURAI from JUNE 2020 TO DECEMBER 2020

The patients were subjected to either Lichtenstein or Desarda's method of hernia repair after taking written consent to participate in the study. Purpose of the study and the methods of treatment were carefully explained to the patients individually. They were allowed to ask questions freely to ensure that they had understood the whole procedure and the concept of blinding.Shiefield score for Pain measurement was explained to all patients in detail. The diagnosis of primary inguinal hernia was made on basis of history of reducible groin swelling and essentially on clinical examination. Detailed history was collected Detailed physical examination was conducted by same examiner and classification was done according to EUS class. Telephonic contact numbers and detailed address were collected for follow up.

CRITERIA FOR SAMPLING INCLUSION CRITERIA

All cases of inguinal hernia admitted for surgery

1. Above 18 -75years of age.
2. With a primary, reducible inguinal or inguino-scrotal hernia; unilateral or bilateral

EXCLUSION CRITERIA

Patients with:

1. Old and debilitated patients of poor general condition as they will be unable to give an accurate assessment of the key outcomes of the operation.
2. Recurrent Hernias.
3. Per operative finding of separated, thin and/or weak external oblique aponeuros

Lichtenstein Operative technique

A transverse incision is deepened down to external oblique aponeurosis. The spermatic cord is mobilized in the usual way.Direct sacs are inverted and imbricated using a non absorbable suture to flatten the posterior wall. Indirect sacs are dissected from the cord up to extra peritoneal fat and then either excised or inverted. If deep ring is widened (Gilbert classification 2 or 3), a cone of mesh is inserted and anchored, usually super laterally and sometimes inferiorly to the inguinal ligament by two or three non absorbable sutures. Inguinoscrotal sacs are transected in the canal and the proximal portion closed and dealt as mentioned earlier, where as the mouth of distal portion is left undissected, but wide open.

Onlay mesh: A polypropylene mesh is sutured along its lower border to the pubic tubercle, the lacunar ligament and the inguinal ligament to beyond the internal ring with a continuous suture of monofilament 3-0 polypropylene. The medial edge is sutured to the rectus sheath, also with continuous suture. with few absorbable interrupted sutures while avoiding injury to or entrapment of the iliohypogastric nerve. A slit

is made at the lateral end creating two tails, The lower edges of the two tails which encircle the cord are fixed to the shelving margin of Poupart's ligament. This creates a new internal ring made of mesh The wound is closed.

Dr. DESARDA'S HERNIORAPPHY WITHOUT MESH:

Many operations developed to date deal only with anatomical aspects of the repair. Any failure in these operations is because of the physiological aspects have not been considered while developing a new operating technique. A new technique of pure tissue repair of any type of inguinal hernia without a mesh, based on the concept of constructing a strong and physiologically dynamic posterior wall to inguinal canal with the help of the external oblique muscle and its aponeurosis.

A strip of external oblique aponeurosis gives replacement to the absent aponeurosis extensions in the posterior wall, making it strong, and the additional strength of external oblique muscle to the weakened internal oblique and transverse abdominis muscle keeps it physiologically dynamic.

COMPARISON OF STUDY GROUPS

	COMPARISON OF	**DESARDA**	**LICHTENSTEIN**
		GROUP -D	GROUP-L
1	Demography		
	Male	33	35
	Female	3	1
	Mean age	44.94	45.47
2	Mode of presentation		
	Swelling only	28	27
	Swelling with pain	8h	9
3	Straining factors		
	BOO	0	0
	Constipation	1	0
	Chronic cough	14	19
	smoking	15	21
4	Location		

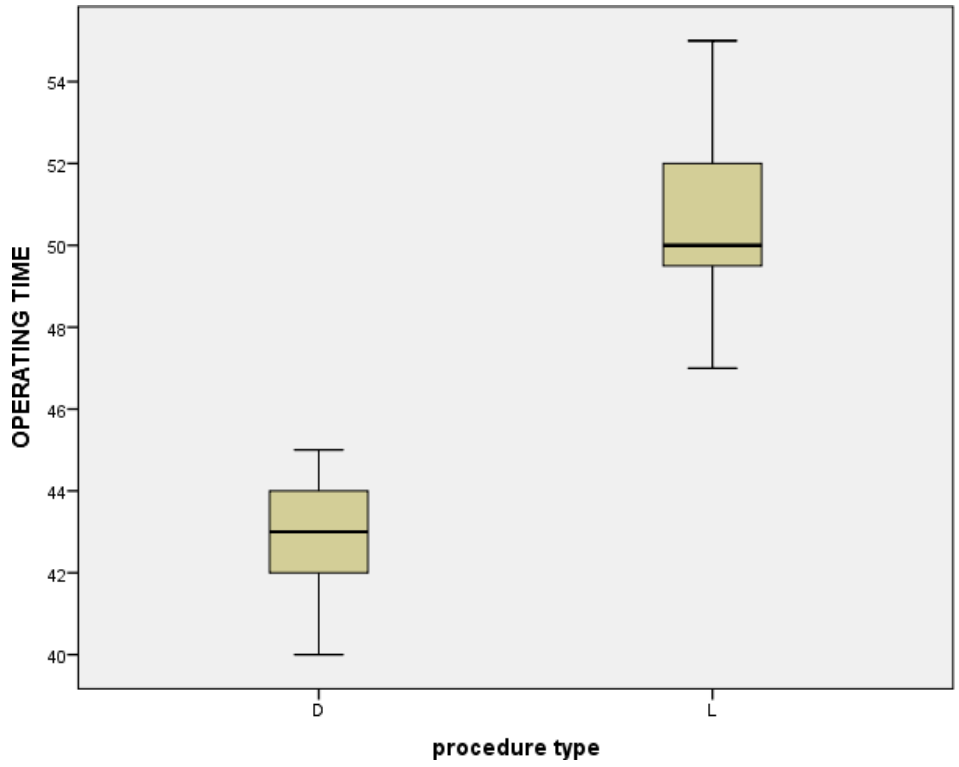
	Right	18	19
	Left	10	15
	Bilateral	8	2
5	TYPE		
	Direct	18	17
	Indirect	18	19

OUTCOME ASSESMENT:

COMPARISION OF OPERATIVE TIMES:

The mean duration of surgery in Desarda's group was 42.83±1.732 while that in Lichtenstein group was 50.72±2.009.There was a statistically significant difference of nearly 8 minutes with a P value of <0.001

	D		L		P value
	Mean	St. deviation	Mean	St. deviation	
OPERATING TIME	42.83	1.732	50.72	2.009	<0.001



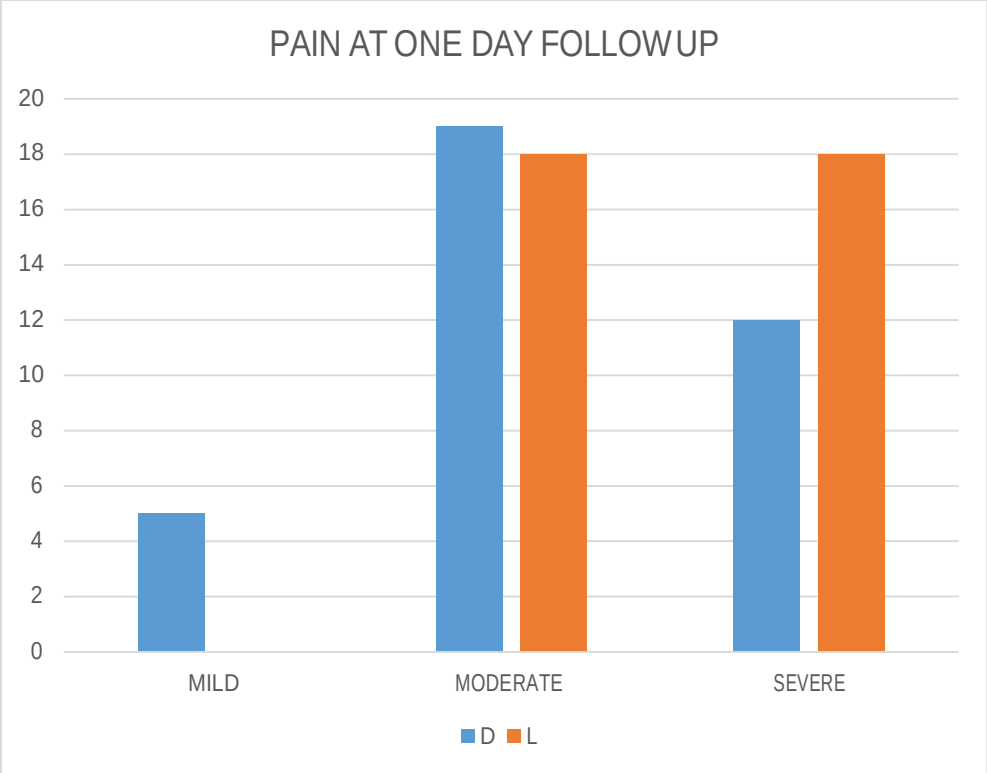
COMPARISON OF POST OPERATIVE PAIN:

Post operative pain is analysed in two groups (D & L), post operative pain was calculated at post operative day 1, 3rd, 14th day, 1st month, 3rd month, and 6th month by Sheffield scale for pain.0-no pain, 1(mild pain) - no pain at rest but appears during movement, 2(moderate) -temporary pain at rest and moderate during movement,3(sever) -constant pain at rest and sever during movement. The results are compared with p value.

Crosstab

			procedure type		P value
			D	L	
PAIN at one day follow up	1	Count	5	0	0.49
		% within procedure type	13.9%	0.0%	
	2	Count	19	18	
		% within procedure type	52.8%	50.0%	
	3	Count	12	18	
		% within procedure type	33.3%	50.0%	
Total		Count	36	36	
		% within procedure type	100.0%	100.0%	

PAIN at one day follow up



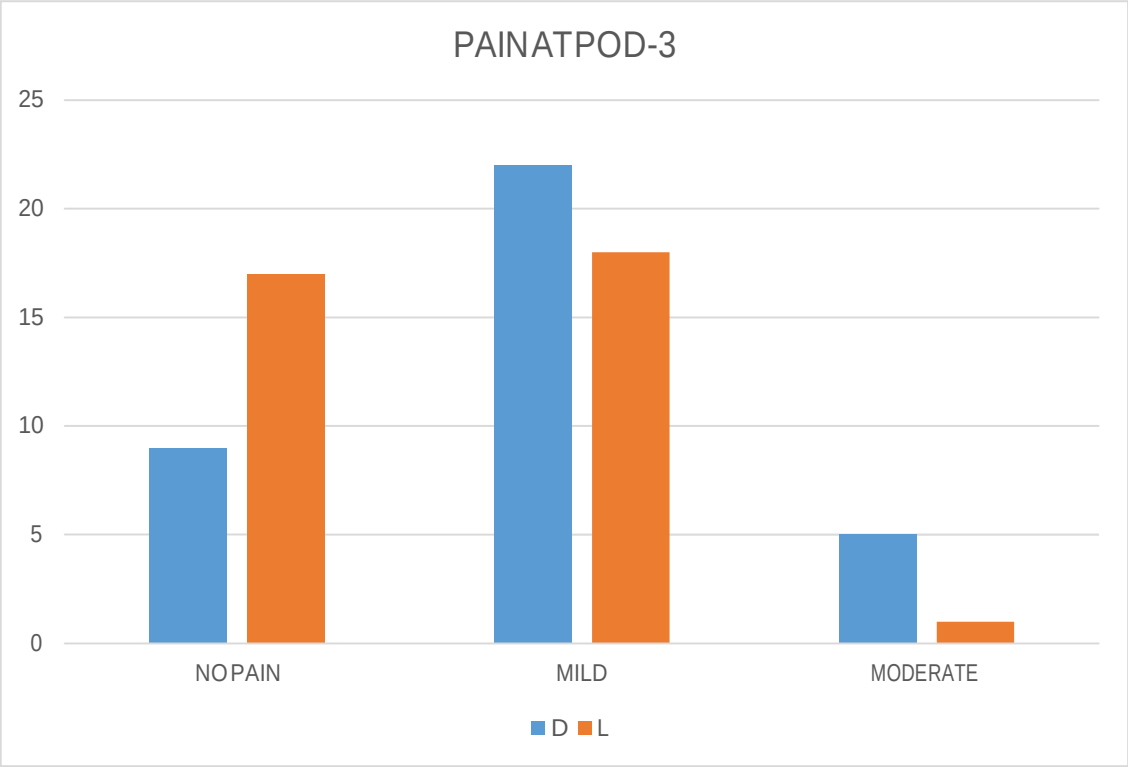
On post operative day -1: 13.9% vs. 0.0% had mild pain, 52.8% vs 50.0% had moderate pain, 33.3% vs. 50.0% had severe pain in Desarda's and Lichtenstein group respectively. Here the p value was found to be insignificant (p>0.05).

PAIN at 3 day follow up

Crosstab

			procedure type		P value
			D	L	
	0	Count	9	17	
		% within procedure type	25.0%	47.2%	

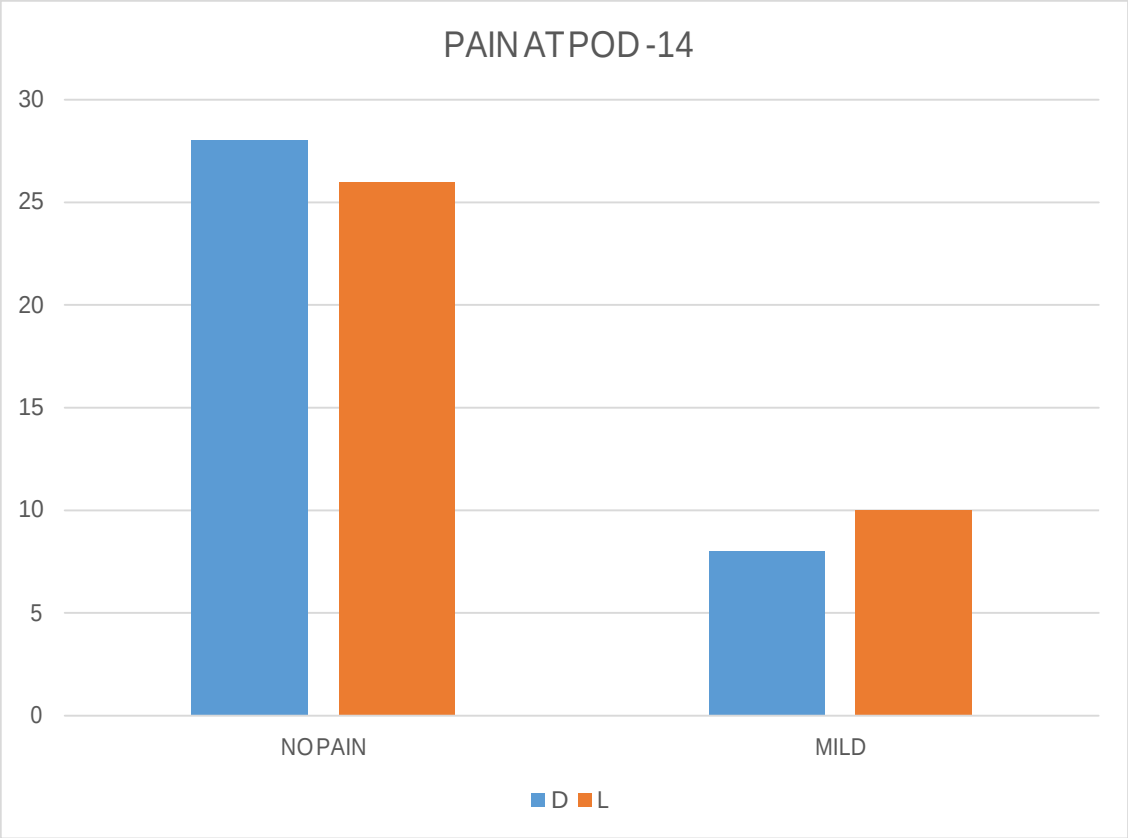
		Count	22	18	
PAIN at 3 day follow up	1	% within procedure type	61.1%	50.0%	0.07
		Count	5	1	
	2	% within procedure type	13.9%	2.8%	
		Count	36	36	
Total		% within procedure type	100.0%	100.0%	



On POD-3; 25.0% vs 47.2% had no pain, 61.1% vs. 50.0% had mild pain, and 13.9% vs. 2.8% had severe pain in both desarda's and Lichtenstein group respectively with insignificant p value (p -> 0.05).

Pain at 14 day follows up
Crosstab

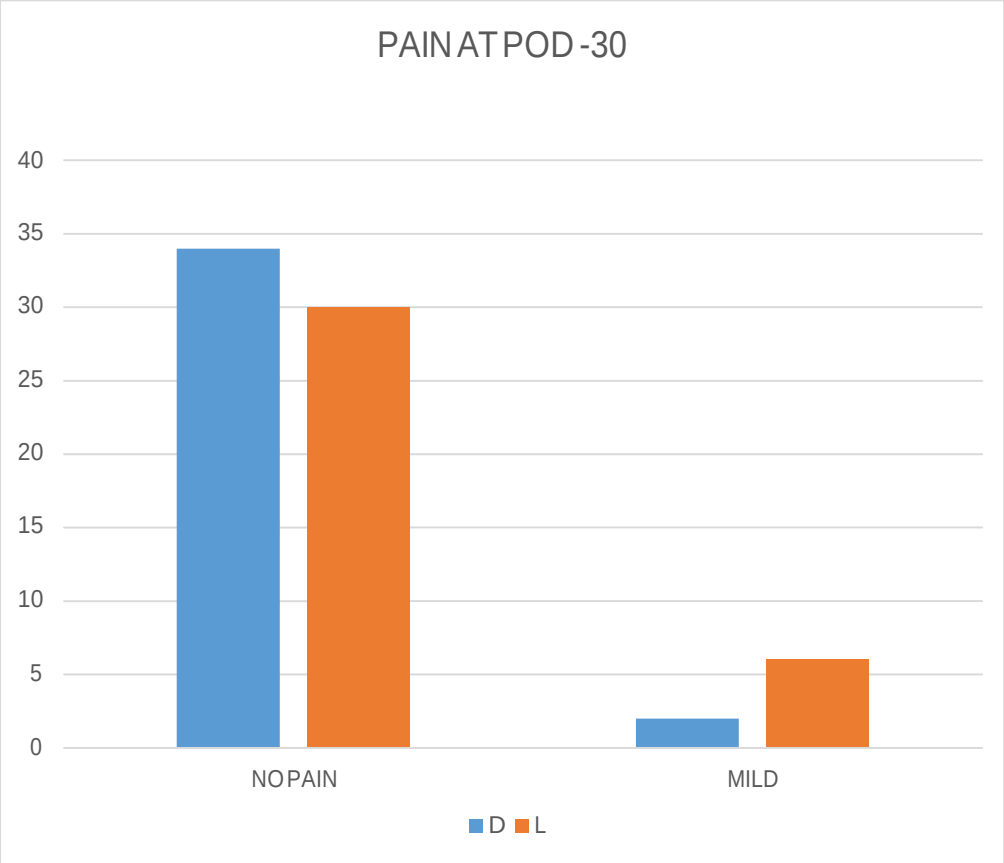
		procedure type		P value
		D	L	
	Count	28	26	
0	% within procedure type	77.8%	72.2%	0.58
pain at 14 day follow up	Count	8	10	
1	% within procedure type	22.2%	27.8%	
	Count	36	36	
Total	% within procedure type	100.0%	100.0%	



On POD-14; 77.8% vs. 72.2% patients had no pain, 22.2% vs. 27.8% had mild pain in Desarda's and Lichtenstein group respectively with less significant p value (p>0.05).

Pain at 30 day follows up
Crosstab

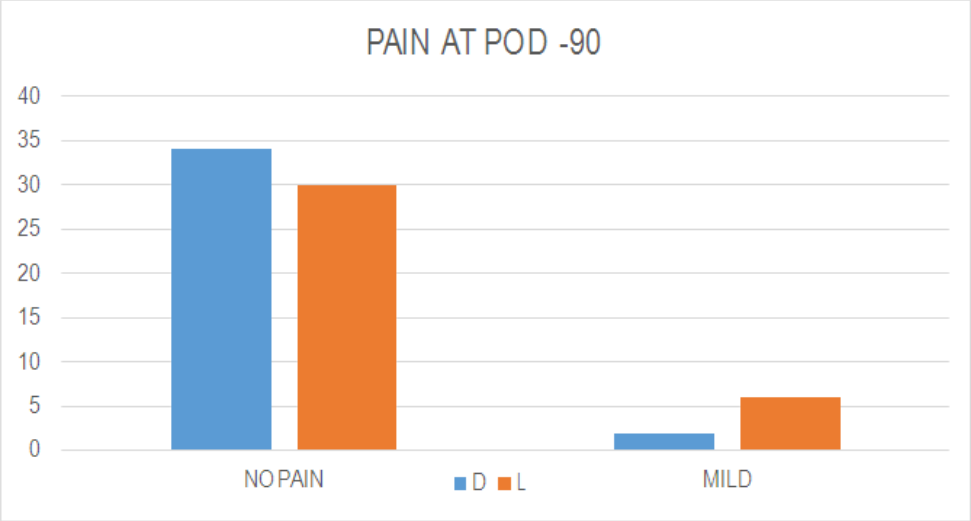
		procedure type		P value
		D	L	
pain at 30 day follow up	0 Count	34	30	0.13
	0 % within procedure type	94.4%	83.3%	
	1 Count	2	6	
	1 % within procedure type	5.6%	16.7%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



On POD-30; 94.4% vs. 83.3% had no pain, 5.6% vs. 16.7% had mild pain in Desarda's and Lichtenstein group respectively with insignificant p value(p>0.05).

Pain at 90 day follows up

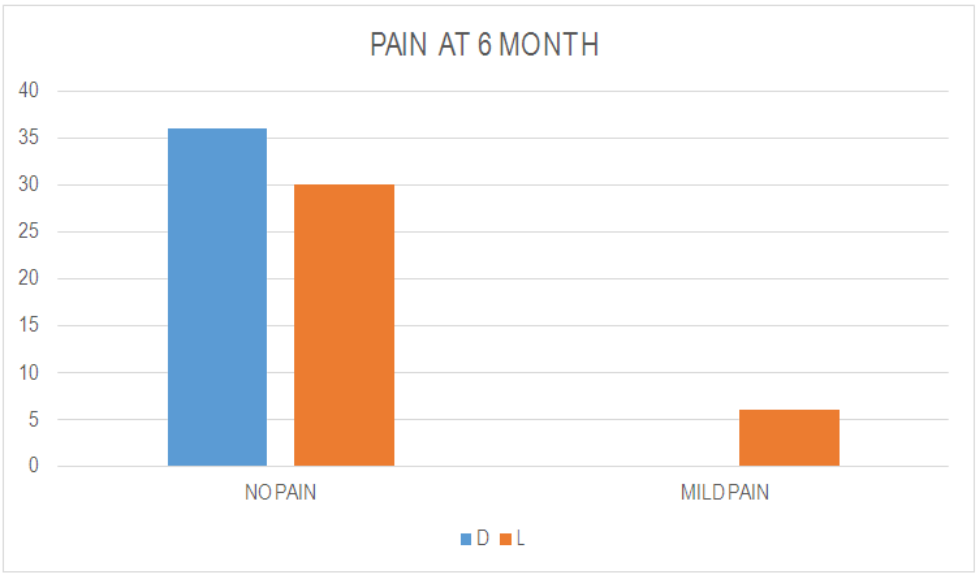
		procedure type		P value
		D	L	
pain at 90 day follow up 0	Count	34	30	0.13
	% within procedure type	94.4%	83.3%	
1	Count	2	6	
	% within procedure type	5.6%	16.7%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



On POD-90; 94.4% vs. 83.3% patients had no pain, 5.6% vs. 16.7% had mild pain in Desarda's and Lichtenstein group respectively with insignificant p value (p->0.05).

Pain at 6 month follows up (Chronic pain)

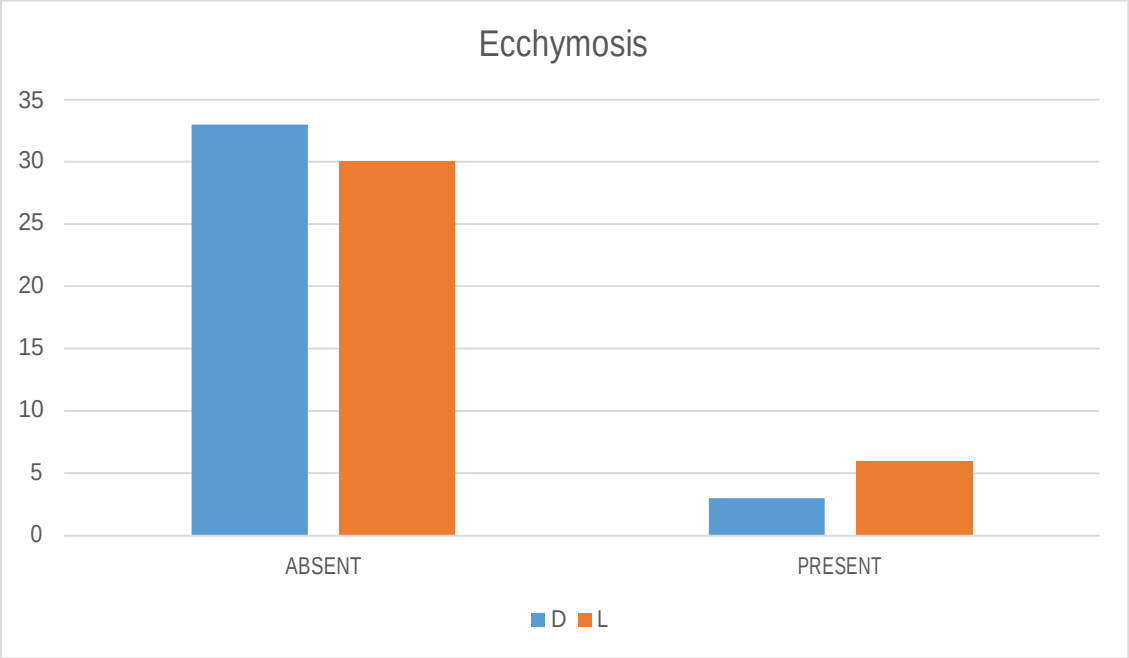
		procedure type		P value
		D	L	
pain at 6 month follow up 0	Count	36	30	0.04
	% within procedure type	100%	83.3%	
1	Count	0	6	
	% within procedure type	0%	16.7%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



In this study none of the patients of Desarda's group had chronic groin pain when compare to Lichtenstein with significant p value 0.04

ECCHYMOSIS
Crosstab

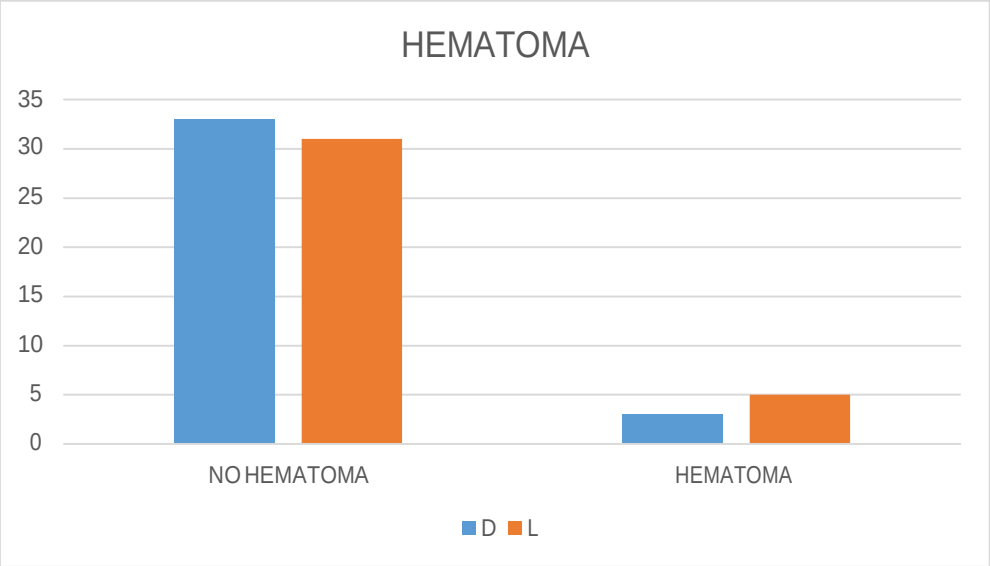
		procedure type		P value
		D	L	
absent Ecchymosed	Count	33	30	0.23
	% within procedure type	91.7%	83.3%	
present	Count	3	6	
	% within procedure type	8.3%	16.7%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



Present study 3(8.3%) patients in Desarda's and 6(16.7%) patients in Lichtenstein group had Ecchymosed with insignificant p value (p>0.05).

HEMATOMA
Crosstab

		procedure type		P value
		D	L	
no hematoma HEMATOMA	Count	33	31	0.355
	% within procedure type	91.7%	86.1%	
Hematoma	Count	3	5	
	% within procedure type	8.3%	13.9%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	

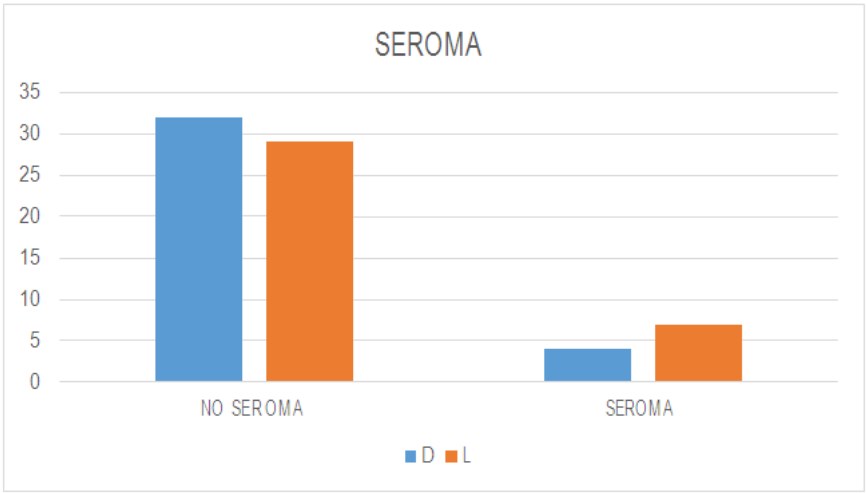


Present study 3(8.3%) patients and 5(13.9%) patients had hematoma in Desarda's and Lichtenstein group respectively with insignificant p- value(p>0.05).

SEROMA

Crosstab

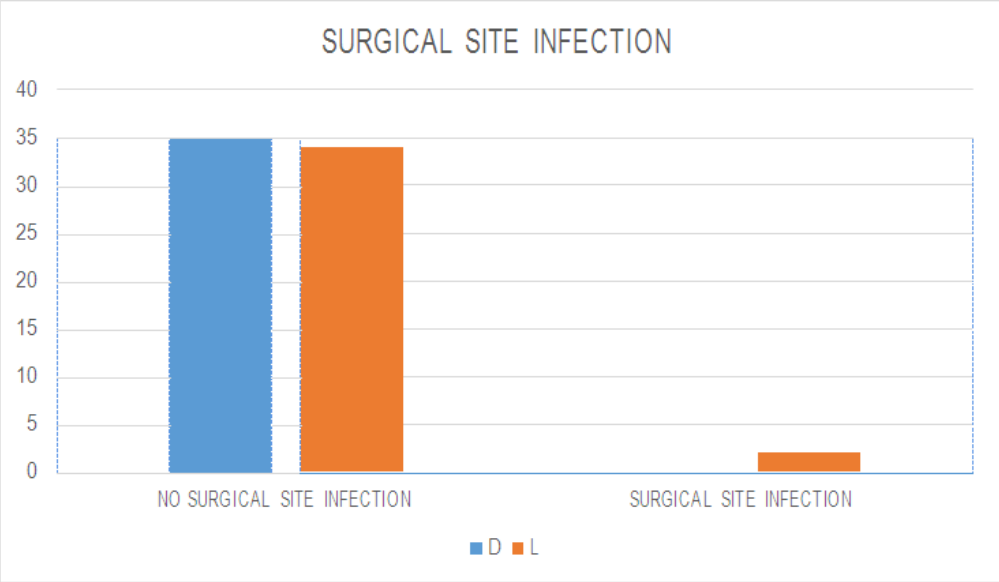
		procedure type		P value
		D	L	
No seroma	Count	32	29	0.25
	% within procedure type	88.9%	80.6%	
SEROMA				
Seroma	Count	4	7	
	% within procedure type	11.1%	19.4%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



Present study 4(11.1%) patients and 7(19.4%) patients had seroma formation in Desarda's and Lichtenstein group respectively. Here p value is insignificant (P>0.05).

SURGICAL SITE INFECTION

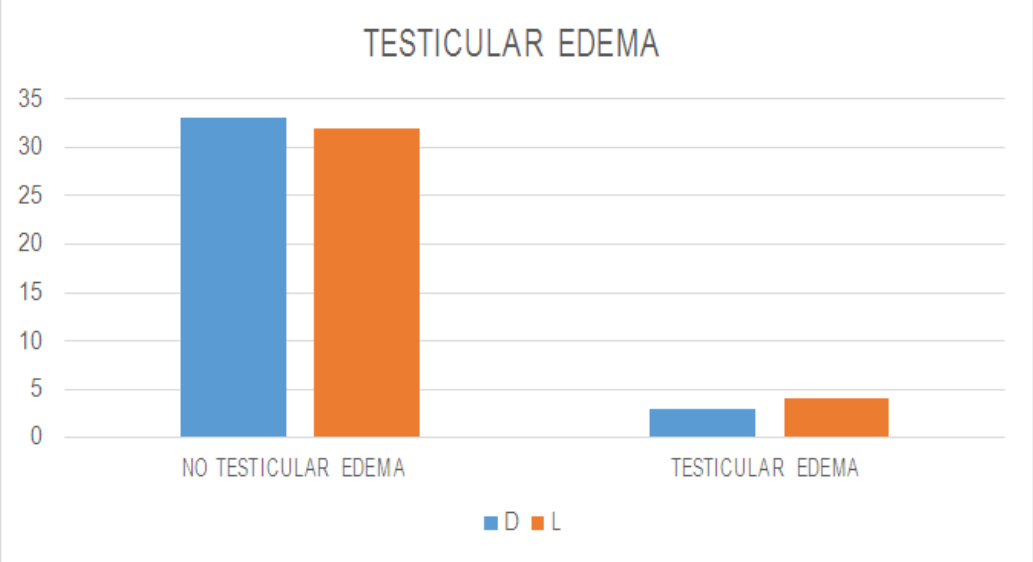
			procedure type		P valye
			D	L	
SURGICAL SITE INFECTION	no surgical site infection	Count	35	34	0.5
		% within procedure type	97.2%	94.4%	
	surgical site infection	Count	1	2	
		% within procedure type	2.8%	5.6%	
Total		Count	36	36	
		% within procedure type	100.0%	100.0%	



Present study only one patient (2.8%) in Desarda's group and 2(5.6%) patient in Lichtenstein group had surgical site infection with insignificant p value(p>0.05).

TESTICULAR EDEMA

			procedure type		P value
			D	L	
TESTICUL AR EDEMA	no testicular oedema	Count	33	32	0.5
		% within procedure type	91.7%	88.9%	
	testicular oedema	Count	3	4	
		% within procedure type	8.3%	11.1%	
Total		Count	36	36	
		% within procedure type	100.0%	100.0%	

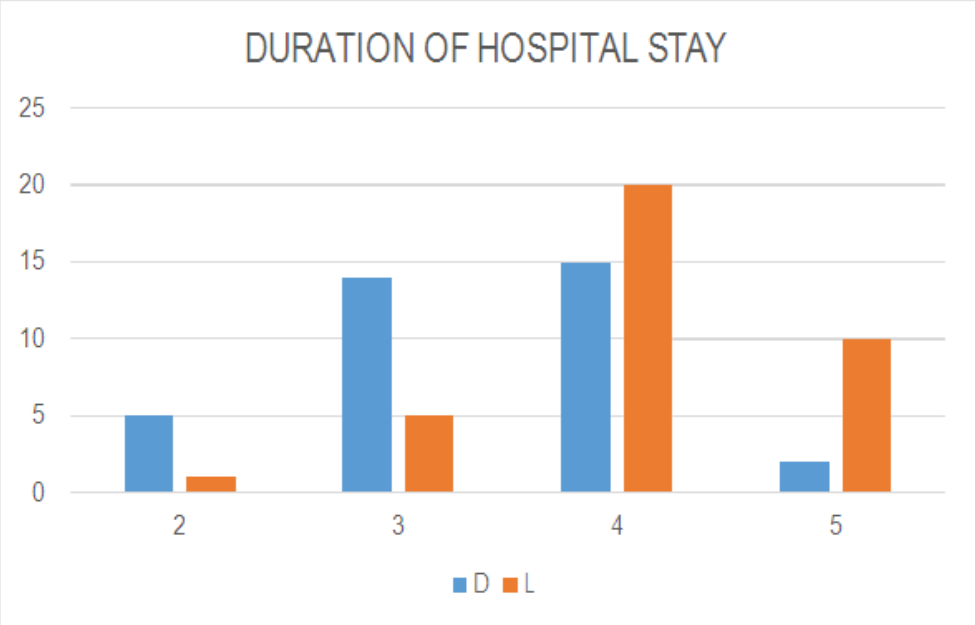


Present study 3(8.3%) and 4(11.1%) patients had testicular oedema in Desarda's and Lichtenstein group respectively with insignificant p value (P>0.05)

DURATION OF HOSPITAL STAY

Mean duration of post operative hospital stay in Desarda's group was 3.38± 0.97days while Lichtenstein group was 4.08 ±0.73 days with significant p value of 0.04.

		procedure type		P value
		D	L	
2	Count	5	1	0.04
	% within procedure type	13.9%	2.8%	
3	Count	14	5	
	% within procedure type	38.9%	13.9%	
Duration of Hospital Stay 4	Count	15	20	
	% within procedure type	41.7%	55.6%	
5	Count	2	10	
	% within procedure type	5.6%	27.8%	
Total	Count	36	36	
	% within procedure type	100.0%	100.0%	



RETURN TO NORMAL ACTIVITY:

The time taken for the patient to return to normal activity was noted in both the groups. In desarda's group the mean time taken by the patient to return to normal activity was 6.19±0.74 while in Lichtenstein group was 7.08±1.02 days.There is a statistically significant difference between two groups with a **P value of 0.001.**

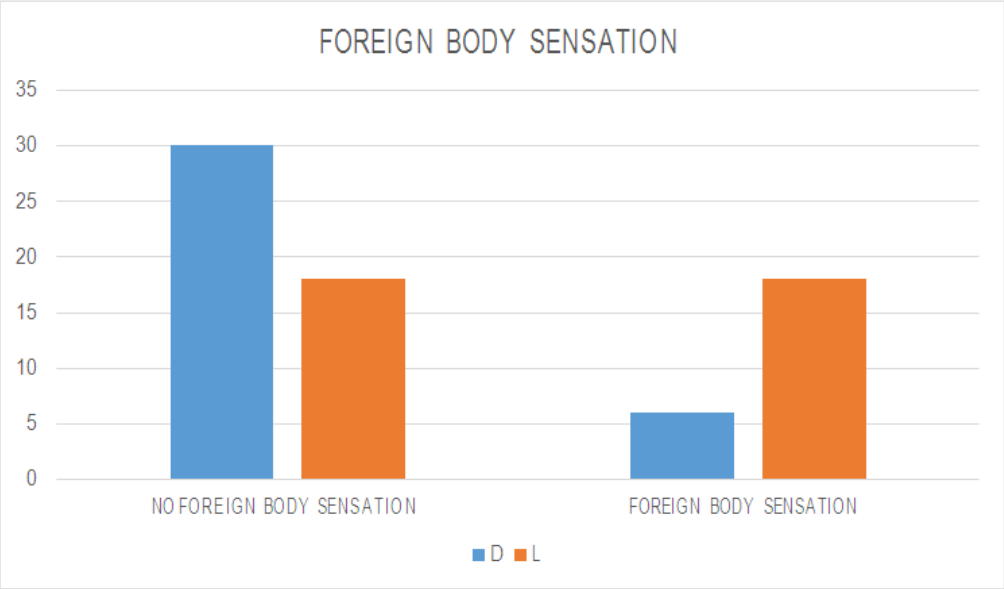
		procedure type		P value
		D	L	
4	Count	1	1	<0.001
	% within procedure type	2.7%	2.7%	
5	Count	4	2	
	% within procedure type	11.1%	5.5%	
Return To Normal Activity				
6	Count	18	5	
	% within procedure type	50%	13.8%	
7	Count	13	13	
	% within procedure type	36.1%	36.1%	
8	Count	0	15	
	% within procedure type	0%	41.6%	
Total	Count	36	36	
	% within procedure type	100%	100%	

RETURN TO WORK ACTIVITY

The time taken for the patient to return to work activity was noted in both the groups. In Desarda's group the mean time taken by the patient to return to work activity was 14.31±0.822 while in Lichtenstein group was 15.33±0.89 days. There is a statistically significant difference between two groups with a **P value of 0.001.**

		procedure type		P value
		D	L	
	Count	4	0	
13	% within procedure type	11.1%	0%	
	Count	21	6	<0.001
14	% within procedure type	58.3%	16.6%	
RETURN TO WORK ACTIVITY				
	Count	7	13	
15	% within procedure type	19.4%	36.1%	
16	Count	4	13	
17	% within procedure type	11.1%	36.1%	
	Count	0	4	
	% within procedure type			
	Count	0%	11.1%	
Total	% within procedure type	36 100%	36 100%	

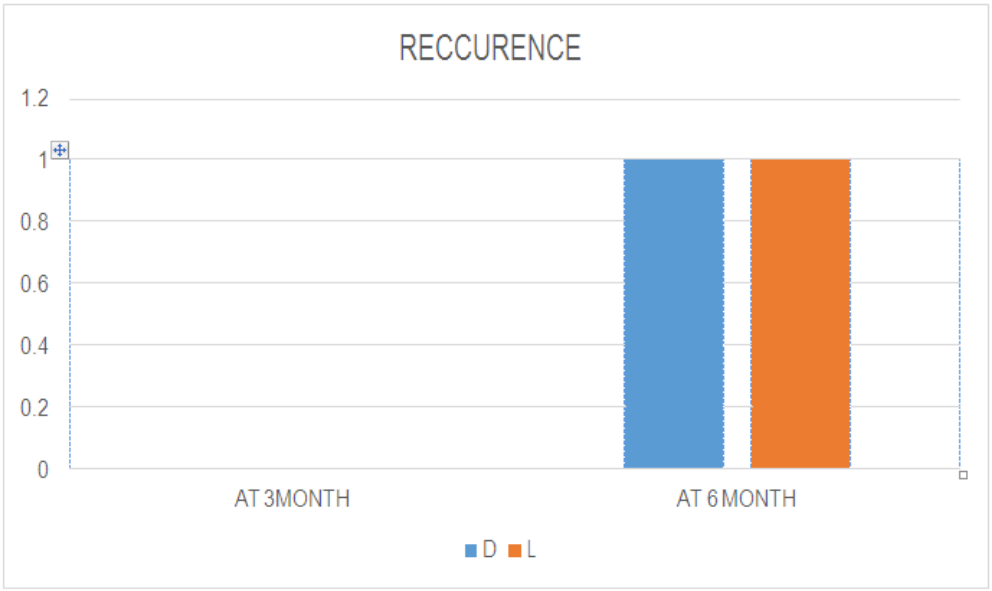
EVALUATION OF FOREIGN BODY SENSATION



In this study 6 (16.6%) and 18 (50.0%) patient had foreign body sensation in Desarda's and Liechtenstein group respectively. However there is a significant statistical difference in both groups with P value of 0.04.

EVALUATION OF RECCURENCE IN BOTH GROUPS AFTER 6 MONTH FOLLOWS UP:
After 6 months of follow up there was 1 recurrence in both the groups. No statistical significance with p value of 1.00

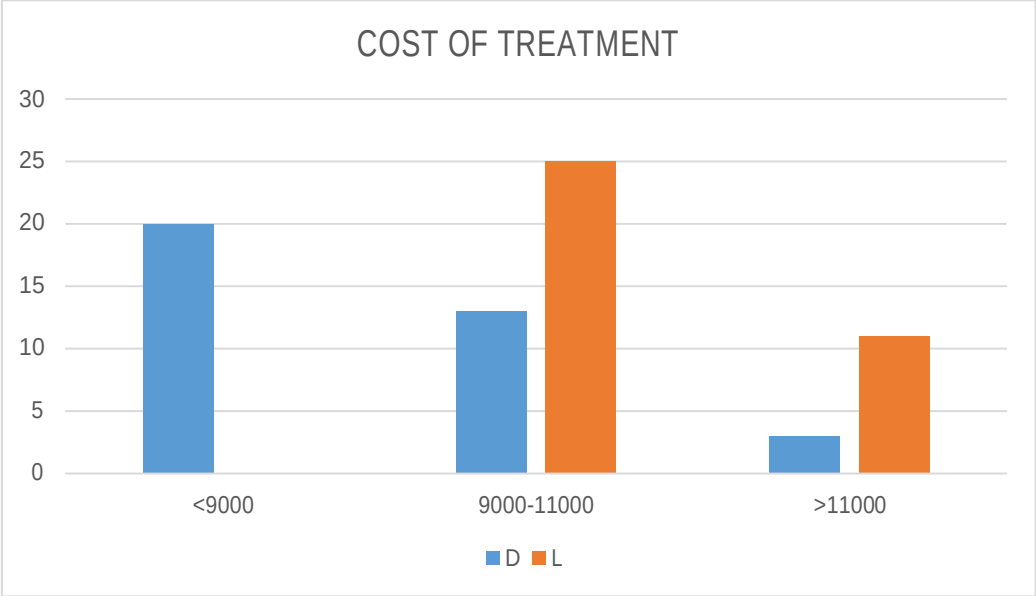
	D	L	P value
Recurrence at 6 month	1(0%)	1(0%)	1.00



COMPARISION OF COST OF TREATMENT BETWEEN THE TWO GROUPS:

The cost of treatment in total between two groups was compared. The mean cost of treatment in Lichtenstein group was Rs.11200.6±808.2 while that in Desarda's group was Rs.9100.6±1200.1 which was lesser by nearly 2000 rs. The difference was statistically significant with a p value of 0.02.

Cost of treatment	D	L	P value
< 9000	20(55.5%)	0(0%)	0.02
9000-11000	13(36.1%)	25(69.4%)	
>11000	3(8.3%)	11(30.5%)	
TOTAL	36	36	



IV. Discussion

Inguinal hernia is the most common surgical abdominal entity in the adultsIn the past decade Lichtenstein repair has become the gold standard for treatment of inguinal hernias mainly due to the reduction in recurrences noted. It is used as blanket surgery for all types and sizes of inguinal hernia with very few expectations. However it is practiced widely it is far from the definition of an ideal hernia repair as it is not tissue based and has complications likes chronic inguinal pain as quoted in an editorial in annuals of surgery in 2001 which observed that the incidence of chronic groin pain has dramatically increased from around 3% to

nearly 19%.[87] Nerve entrapment within the mesh is often blamed for this consequence. Several other complications of mesh repair include hematoma, seroma, ischemic orchitis, testicular atrophy, mesh infection and sinus formation. Young patients especially those undergoing mesh repair for indirect hernias are affected mostly with a risk of infertility in future.

Hence a search for ideal hernia repair still underway and Desarda's procedure might be the procedure satisfying procedure for an ideal hernia repair as it is tension free, tissue based and as per results of varies studies as less chronic groin pain than mesh repair as nerve entrapment does not occur. There is no risk of mesh infection as it uses un undetached strip of external oblique for repair .external oblique aponeurosis acts as a near perfect mess alternative as it as negligible foreign body reactions, causes no pathologic fibrosis, as low adhesion potential, as tensile strength >16N,Is of biological origin and matches the abdominal wall dynamics as closely as possible in flexibility, elasticity and memory as per the criteria let down by 30th international congress of European hernia society. This procedure if proved successful can be used extensively in all types of hernias where external oblique aponeurosis if well preserved.

The present study was carried out at GRH MADURAI Comparing these two procedures in various clinical scenarios and comparing the outcomes in immediate post-operative period and by following up these patients for 6 months. The results were analyzed and compared to various other studies done in this field.

distribution of types of hernia varied slightly from other studies with Right indirect inguinal being most common. Manyilirah et al reported Right indirect hernia as the most common type. However there is no absolute correlation regarding this variable in all the studies oveall. There is no significant difference between the associated co morbidities a seen in Szopinski J et al.70h The BMI distribution of patients in present study correlated with Manyilirah et al with most number of patients falling in 18.5-25 kg/m2 category (100%).

V. Conclusion

The present study comparing Desarda's technique for hernia repair with Lichtenstein's mesh repair for inguinal hernia came out with the following conclusions:

The operating time for Desarda's procedure is lesser then that of Lichtenstein's Mesh repair overall by nearly 8 mins. Desarda's technique is a relatively easy technique to master and is easily reproducible. However a thinned out external oblique muscle poses a difficulty in performing the procedure. Desarda's technique is best suited for young patients and for Indirect Hernias as it has less risk of post-operative orchitis, testicular atrophy, infertility and inguinodynia.

The postoperative pain is lesser with Desarda's technique on all postoperative days and patients ambulate faster and get discharged faster with this technique than with mesh repair. The risk of complications is roughly equal in both the procedures, however Desarda's technique is inherently free of risk of mesh infection as no prosthesis is used. There is a dramatic difference in incidence of chronic pain in Desarda's technique as compared to mesh placement as there is no risk of nerve entrapment. The recurrence data in this study is insufficient to comment on the chances of recurrence in these patients. However other studies in this aspect prove that there is no significant difference between the procedures as far as recurrence is concerned. On comparison of costs Desarda'stechnique is definitely more cost effective than Lichtenstein's as no mesh is used and the cost of antibiotics, mesh and hospital stay are reduced. Desarda's technique is definitely a promising procedure and has a lot of potential to replace mesh repair in certain conditions and is best suited for situations like strangulated hernias where mesh use is contraindicated. More number of Randomized control trails and multicenter trails need to be undertaken to study the pros and cons of this procedure in future. Lichtenstein's has certain disadvantages like ischemic orchitis , infertility and chronic pain, hence cannot be used as a blanket surgery for all types and sizes of hernia. Desarda's technique is a very reasonable alternative to mesh repair in many clinical situations. Desarda's repair is also ideally suited for repair of Inguinal hernia in female patients.

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