



Comparative Study of Desarda's Repair versus Lichtenstein's Hernioplasty in the Management of Inguinal Hernia

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Abstract

Background: Hernia repair is one of the commonly performed surgical procedures in the world as well as in India. India a country whose large population demography consists of rural poor and urban poor is in need of a cost effective Hernia repair procedure.

Hence the effectiveness and feasibility of newer, with similar to better outcome and cost effective techniques should be weighed against the now widely used surgical options for hernia repair. Desarda's repair eliminates the problems associated with mesh based techniques such as Discomfort, Foreign body sensation, Mesh migration and rejection to name a few. It being a no mesh technique reduces the cost burden on the patient without compromising the effectiveness of the treatment with equal to better outcome. In this contrast a comparison of Desarda's repair with Lichtenstein's technique was done to compare operating time, postoperative pain, recovery time, post operative complications and cost effectiveness between two procedures.

Material and Methods: A Comparative study was done among patients in the age group 19-60 years with uncomplicated inguinal hernia admitted to RLJH during the study period. Patients who are immunocompromised, having metabolic diseases and chronic infective diseases and Patients with recurrent inguinal hernia were excluded from the study. A complete detailed history was taken; physical examination was done and relevant investigations were advised after obtaining an informed consent. Patients were divided into two groups using even-odd method to include similar type of cases with respect to age and sex in both groups. Patients willing for the study after completely understanding the two treatment options were divided into two groups. Even group will undergo Desarda's repair and Odd group will undergo Lichtenstein's hernioplasty. Ethical clearance was obtained from Institutional ethical committee prior to the start of the study and Informed consent was obtained from all the study subjects prior to the inclusion.

Statistical analysis: Data was entered into Microsoft excel data sheet and will be analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square was the test of significance. Continuous data will be represented as mean and standard deviation. Independent t test was the test of significance to identify the mean difference between two groups. P value <0.05 will be considered as statistically significant.

Results: Mean age of subjects in Even group was 41.70 ± 13.48 years and in Odd group was 45.60 ± 14.10 years. In Even group, majority of them had Right indirect hernia (45%) and in Odd group, majority of subjects had Right direct and indirect hernia. Mean operating time in even group was 87.15 ± 3.86 min and in odd group was 100.00 ± 5.39 min. Mean post op pain on day 1 in even group was 2.95 ± 0.69 and in odd group was 4.75 ± 0.79 . Mean post op pain on day 3 in even group was 1.15 ± 0.37 and in odd group was 2.10 ± 0.31 . There was significant difference in operating time, post op pain day 1 and day 3 between two groups. In Even group, 0% had complications and in odd group, 5% had Seroma and 10% had urinary retention. Mean day of Fit for discharge in even group was 2.00 ± 0.0 days and in odd group was 3.15 ± 0.48 days. There was significant difference in day of discharge between two groups. Mean Total cost in the even group was 6600 ± 1313.89 Rs and in odd group was 12400 ± 1957.44 . There was significant difference in cost of procedure between two groups. **CONCLUSION:** Study concluded that Desarda repair was better with respect to reduced operating time, post op pain, complications and cost effectiveness compared to Lichtenstein repair.

Keywords: Desarda repair, Lichtenstein repair, inguinal hernia

INTRODUCTION

Inguinal hernia is defined as a protrusion of the contents of the abdominal cavity or pre-peritoneal fat through a hernia defect in the inguinal area, irrespective of whether this is performed. 1 about 75%

of abdominal wall hernias are inguinal hernias, with a lifetime risk of 27% in men and 3% in women.²

Hernia repair is one of the commonly performed surgical procedures in the world as well as in India. India a country whose large population demography consists of rural poor and urban poor is in need of a cost effective Hernia repair procedure. Hence effectiveness and feasibility of newer, with similar to better outcome and cost effective techniques should be weighed against the now widely used surgical options for hernia repair. The groin herniorrhaphies done worldwide every year exceeds 20 million,³ which is one of the top three operations in most western countries.^{4,5} In 1887, Edoardo Bassini first proposed repairing the inguinal canal with silk stitches suturing the conjoined transversus abdominis and internal oblique with the transversalis fascia to the inguinal ligament, which is the first sound technique for the repair of inguinal hernia.⁶ Since that time, more than 70 derivations of tissue-based repairs are described in the literature.⁷ In the 1970s, the Lichtenstein hernia repair was favoured and became the gold standard of open tension-free hernia repair.⁸

However, the use of synthetic prostheses can result in new clinical problems, such as foreign body sensation, chronic groin pain, abdominal wall stiffness and pain related sexual dysfunction, which may affect the daily activities of the patient.^{9,10}

Besides, mesh rejection and migration have been reported.^{11,12} In order to reduce the incidence of complications and postoperative dysfunction, the tissue-based groin herniorrhaphies has re-attracted the attentions in recent years. Current hernia repairs address the anatomic defect and do not restore the physiological factors that prevent hernia formation. Therefore, the surgical physiology of inguinal canal needs to be reconsidered. Thus there is need for a technique, which addresses not only the anatomical repair but also the physiological aspect of the repair and it should be as efficient as Lichtenstein's repair. One such procedure is Desarda's no mesh repair.

In 2001, Desarda proposed a solution that using part of the external oblique aponeurosis (EOA) as a patch for repair, which may reduce the complications compared with meshes. Moreover, the technique requires no complicated dissection or suturing, and is

easy to learn as its developer claimed.^{13,14,15} Desarda's repair eliminates the problems associated with mesh based techniques such as Discomfort, Foreign body sensation, Mesh migration and rejection to name a few. It being a no mesh technique reduces the cost burden on the patient without compromising the effectiveness of the treatment with equal to better outcome. In this context a comparison of Desarda's repair with Lichtenstein's technique has been done in the current study.

AIM

To compare the outcome between two methods of Hernia repair

OBJECTIVES:

1. To study outcome of inguinal hernia repair using Desarda's no mesh repair with regards to operating time, post-operative pain, recovery time, post operative complications and cost effectiveness.
2. To study outcome of inguinal hernia repair using Lichtenstein's mesh repair with regards to operating time, postoperative pain, recovery time, post operative complications and cost effectiveness.
3. To compare outcomes of hernia repair by Desarda's repair and Lichtenstein's hernioplasty with respect to operating time, postoperative pain, recovery time, post operative complications and cost effectiveness.

MATERIALS AND METHODS

SOURCE OF DATA:

All patients admitted with uncomplicated inguinal hernia in the Department of General Surgery, R.L.Jalappa Hospital and Research Centre, Tamaka, Kolar attached to Sri Devaraj Urs Medical College during the study period December- 2017 to September-2019.

INCLUSION CRITERIA:

All patients with age 19-60 years with uncomplicated inguinal hernia admitted to RLJH during the study period

EXCLUSION CRITERIA:

Patients who are immunocompromised having metabolic diseases and chronic infective diseases.

Patients with recurrent inguinal hernia. TYPE OF STUDY: Comparative study Sample Size:

Estimated by using the Meantime taken to resume to normal activities from the study⁹.

Mean time taken to resume to normal activities in lichtenstein's was 10.7±2.7 and in Desarda's was 7.7±3.1.

Using this value at 95% Confidence limit and 80% power and to obtain a mean difference of 3 days. Sample size of 15 was obtained for each group from open epi software.

With 30% loss in followup, the sample size of 15 + 4.5 ≈ 20 cases was included in each group

METHOD OF COLLECTION OF DATA

A complete detailed history was taken; physical examination was done and relevant investigations were advised after obtaining an informed consent. Patients were divided into two groups using even-odd method to include similar type of cases with respect

RESULTS:

to age and sex in both groups. Patients willing for the study after completely understanding the two treatment options were divided into two groups. Even group underwent Desarda's repair and Odd group underwent Lichtenstein's hernioplasty. Patients not willing for the newer treatment modalities i.e. Desarda's repair were treated with the standard line of treatment i.e. Lichtenstein's hernioplasty and were excluded from the study. Patient preferences with regards to inclusion in study were accommodated. All the data was entered in to a structured questionnaire.

STATISTICAL ANALYSIS 37,38,39,40

Data was entered into Microsoft excel data sheet and will be analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square was the test of significance. Continuous data will be represented as mean and standard deviation. Independent t test was the test of significance to identify the mean difference between two groups. p value <0.05 will be considered as statistically significant.

Table 1: Age distribution comparison between two groups

		Group					
		Even		Odd		Total	
		Count	%	Count	%	Count	%
Age	<30 years	6	30.0%	5	25.0%	11	27.5%
	31 to 40 years	5	25.0%	3	15.0%	8	20.0%
	41 to 50 years	3	15.0%	3	15.0%	6	15.0%
	51 to 60 years	5	25.0%	9	45.0%	14	35.0%
	>60 years	1	5.0%	0	0.0%	1	2.5%

$\chi^2 = 2.734, df = 4, p = 0.603$

In Even group, majority of subjects were in age group <30 years (30%) & in Odd group, majority of subjects were in the age group 51 to 60 years (45%). There was no significant difference in age distribution between two groups.

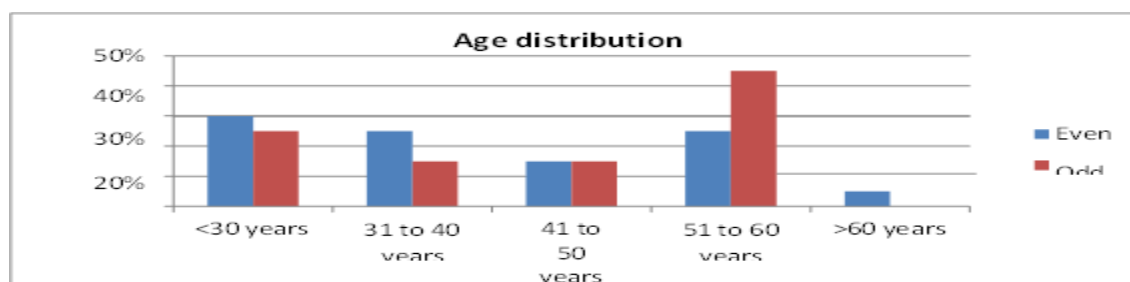


Figure 1: Bar diagram showing Age distribution comparison between two groups

Table 2: Mean age comparison between two groups

		Age		P value
		Mean	SD	
Group	Even	41.70	13.48	0.377
	Odd	45.60	14.10	
	Total	43.65	13.76	

Mean age of subjects in even group was 41.70 ± 13.48 years and in Odd group was 45.60 ± 14.10 . There was no significant difference in Age distribution between two groups.

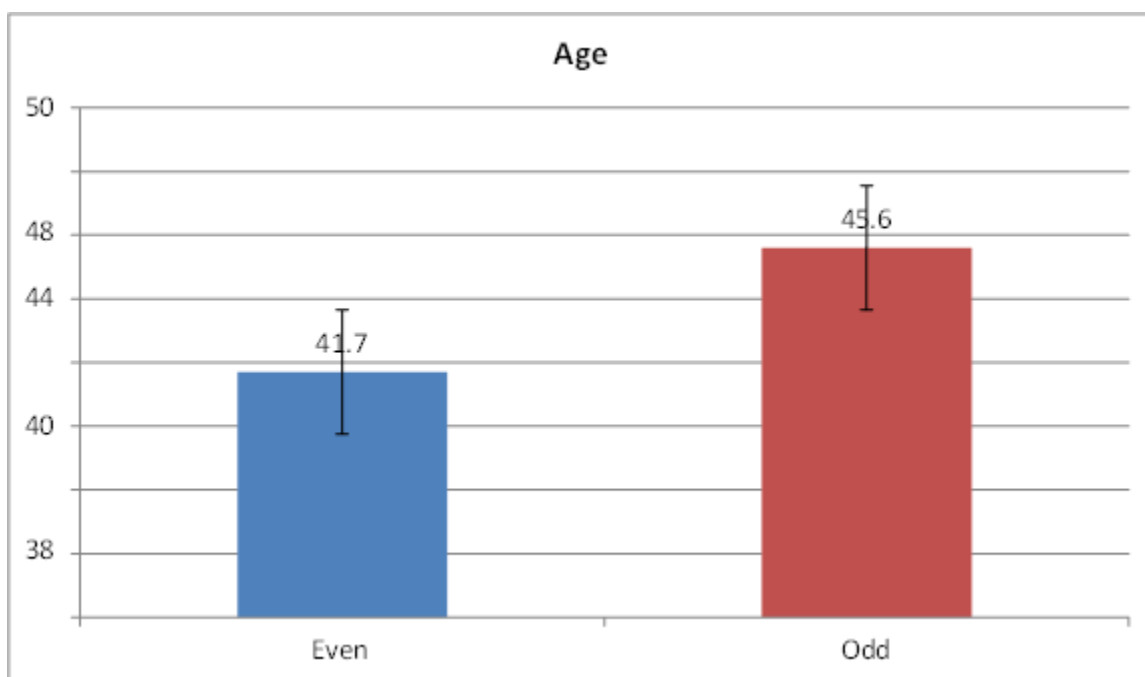


Figure 2: Bar diagram showing Mean age comparison between two groups

Table 3: Gender distribution comparison between two groups

		Group					
		Even		Odd		Total	
		Count	%	Count	%	Count	%
Gender	Male	20	100.0%	20	100.0%	40	100.0%

In the study all the subjects in both the groups were males.

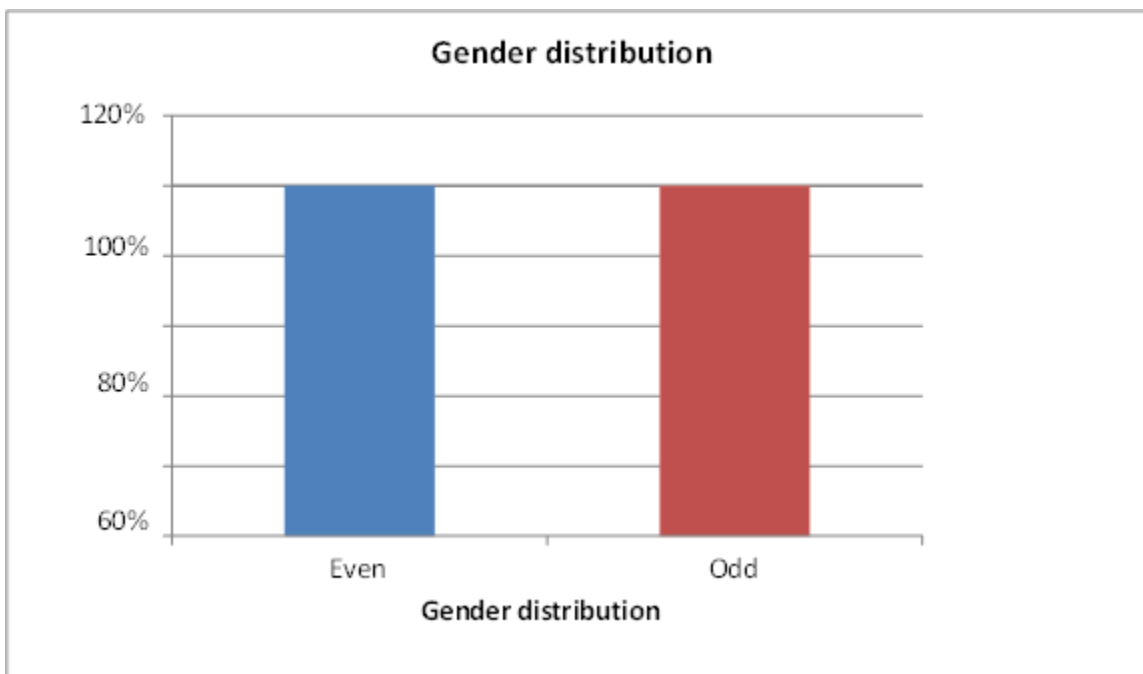


Figure 3: Bar diagram showing Gender distribution comparison between two groups

Table 4: Diagnosis comparison between two groups

		Group					
		Even		Odd		Total	
		Count	%	Count	%	Count	%
Diagnosis	Left Direct	0	0.0%	1	5.0%	1	2.5%
	Left Indirect	7	35.0%	5	25.0%	12	30.0%
	Right Direct	4	20.0%	7	35.0%	11	27.5%
	Right Indirect	9	45.0%	7	35.0%	16	40.0%

$$\chi^2 = 2.402, df = 3, p = 0.493$$

In Even group, majority of them had Right indirect hernia (45%) and in Odd group, majority of subjects had Right direct and indirect hernia. There was no significant difference in diagnosis between two groups.

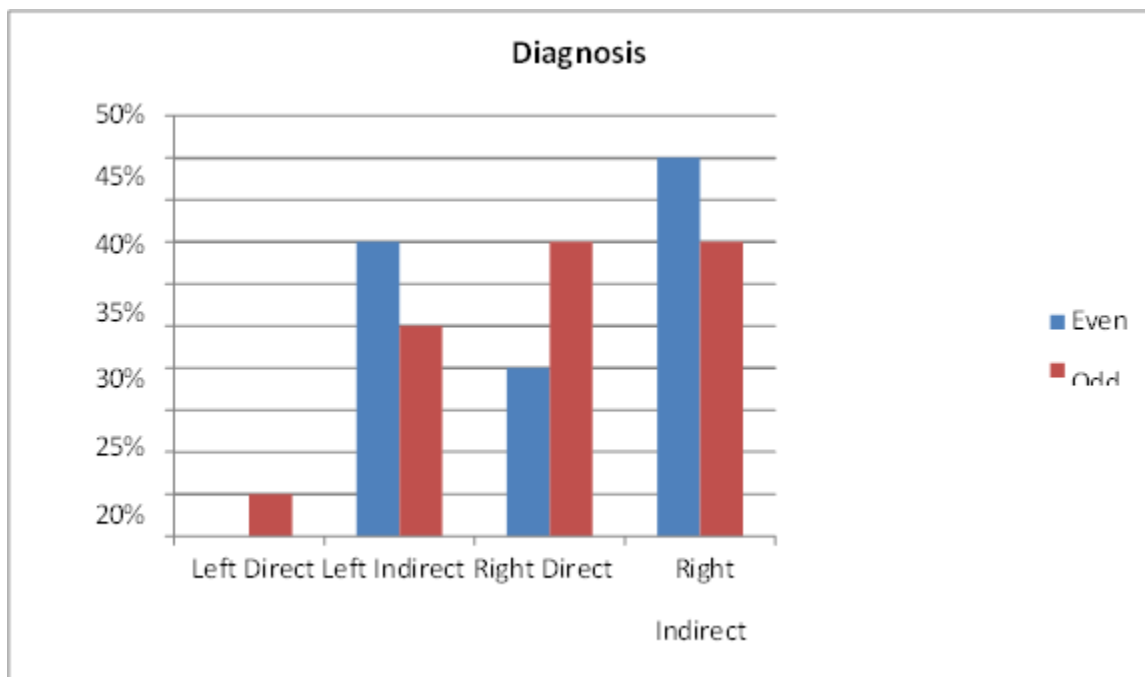


Figure 4: Bar diagram showing Diagnosis comparison between two groups

Table 5: Mean Operating time comparison between two groups

		Operating Time (min)		P value
		Mean	SD	
Group	Even	87.15	3.86	<0.001*
	Odd	100.00	5.39	
	Total	93.58	7.98	

Mean operating time in even group was 87.15 ± 3.86 min and in odd group was 100.00 ± 5.39 min. There was significant difference in operating time between two groups.

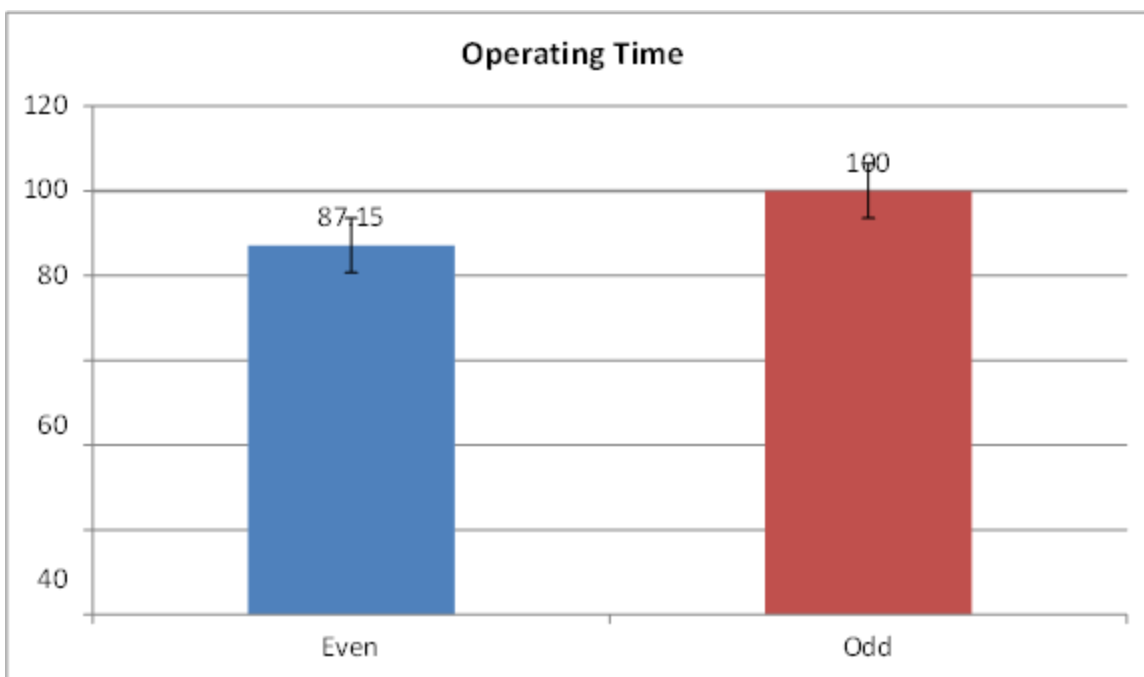


Figure 5: Bar diagram showing Mean Operating time comparison between two groups

Table 6: Mean Post op pain on day 1 and day 3 comparison between two groups

	Group						P value
	Even		Odd		Total		
	Mean	SD	Mean	SD	Mean	SD	
Post-Op Pain (Day 1)	2.95	0.69	4.75	0.79	3.85	1.17	<0.001*
Post-Op Pain (Day 3)	1.15	0.37	2.10	0.31	1.63	0.59	<0.001*

Mean post op pain on day 1 in even group was 2.95 ± 0.69 and in odd group was 4.75 ± 0.79 . There was significant difference in post op pain on day 1 between two groups.

Mean post op pain on day 3 in even group was 1.15 ± 0.37 and in odd group was 2.10 ± 0.31 . There was significant difference in post op pain on day 3 between two groups.

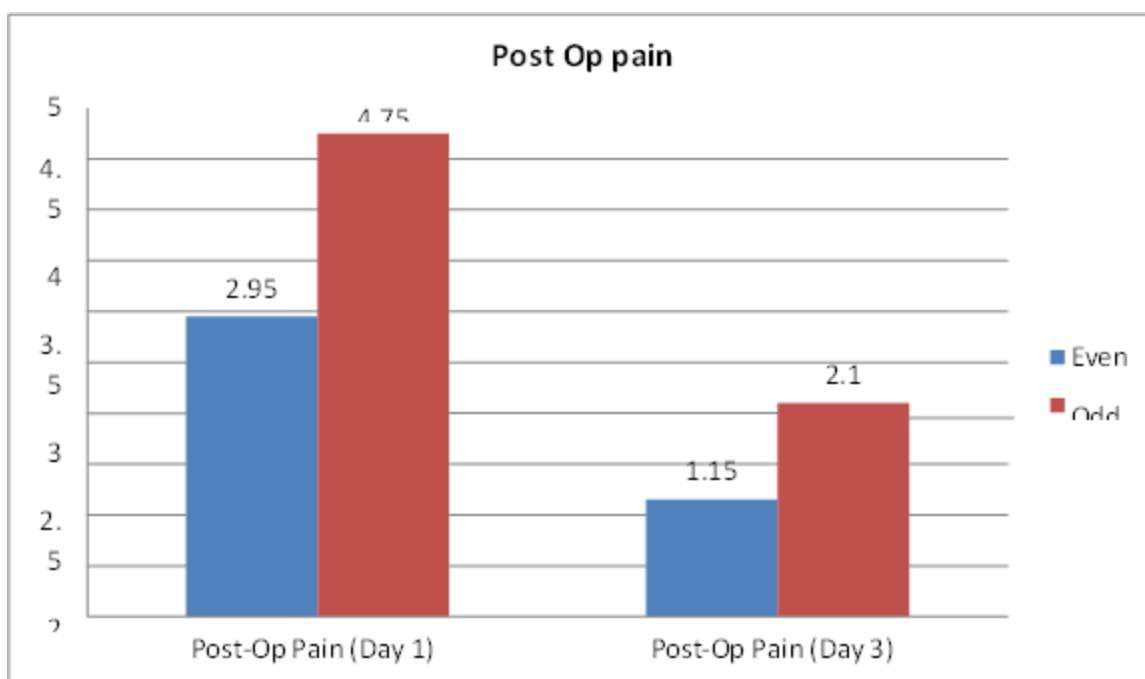


Figure 6: Bar diagram showing Mean Post op pain on day 1 and day 3 comparison between two groups

Table 7: Post op pain on day 1 and day 3 comparison between two groups

		Group						P value
		Even		Odd		Total		
		Count	%	Count	%	Count	%	
POST-OP PAIN (DAY 1)	2	5	25.0%	0	0.0%	5	12.5%	<0.001*
	3	11	55.0%	1	5.0%	12	30.0%	
	4	4	20.0%	6	30.0%	10	25.0%	
	5	0	0.0%	10	50.0%	10	25.0%	
	6	0	0.0%	3	15.0%	3	7.5%	
POST-OP PAIN (DAY 3)	1	17	85.0%	0	0.0%	17	42.5%	<0.001*
	2	3	15.0%	18	90.0%	21	52.5%	
	3	0	0.0%	2	10.0%	2	5.0%	

In Even group, majority of them had pain score of 3 (55%) on day 1 and in odd group, majority of them had pain score of 5 on day 1 (50%). There was significant difference in post op pain between two groups on day 1.

On day 3, in even group, majority of them had pain score of 1 (85%) and in odd group, majority of them had pain score of 2 (90%). There was significant difference in post op pain on day 3 between two groups.

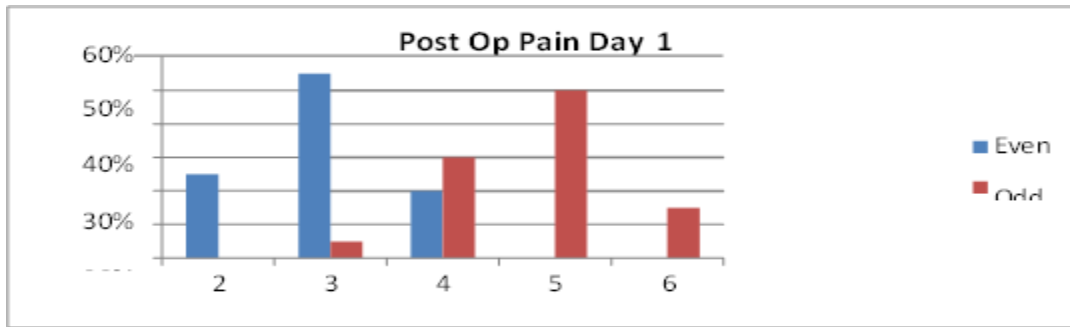


Figure 7: Bar diagram showing Post op pain on day 1 comparison between two groups

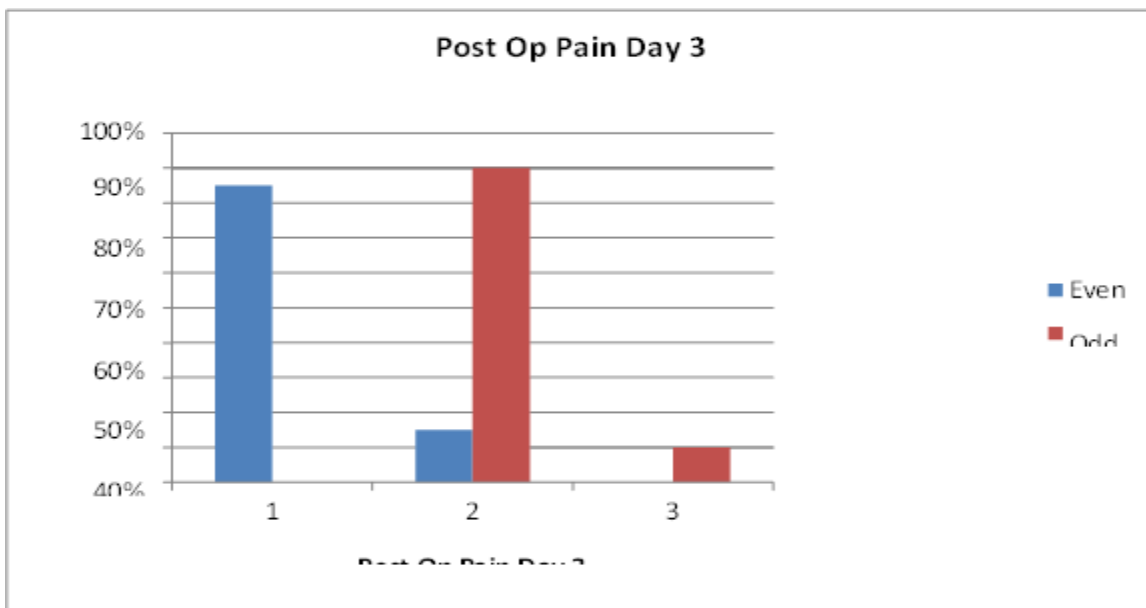


Figure 8: Bar diagram showing Post op pain on day 3 comparison between two groups

Table 8: Complications comparison between two groups

		Group					
		Even		Odd		Total	
		Count	%	Count	%	Count	%
Complications	Nil	20	100.0%	17	85.0%	37	92.5%
	Seroma	0	0.0%	1	5.0%	1	2.5%
	Urinary Retention	0	0.0%	2	10.0%	2	5.0%

$\chi^2 = 3.243, df = 2, p = 0.198$

In Even group, 0% had complications and in odd group, 5% had Seroma and 10% had urinary retention. There was no significant difference in complications between two groups.

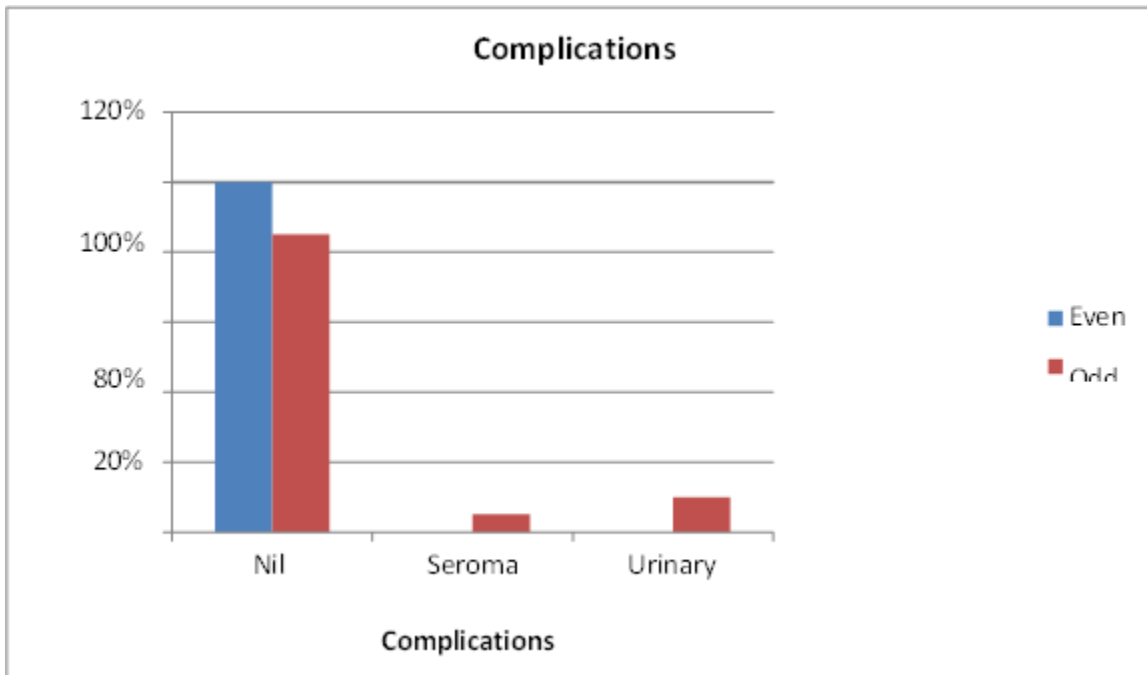


Figure 9: Bar diagram showing Complications comparison between two groups

Table 9: Day on which patient fit for Discharge comparison between two groups

		Group					
		Even		Odd		Total	
		Count	%	Count	%	Count	%
Patient fit for discharge on	DAY 2	20	100.0%	0	0.0%	20	50.0%
	DAY 3	0	0.0%	18	90.0%	18	45.0%
	DAY 4	0	0.0%	1	5.0%	1	2.5%
	DAY 5	0	0.0%	1	5.0%	1	2.5%

$\chi^2 = 40, df = 3, p < 0.001^*$

In Even group, 100% of patients were discharged on day 2 and in odd group, 90% were discharged on day 3, 5% on day 4 and day 5. There was significant difference in day of discharge between two groups.

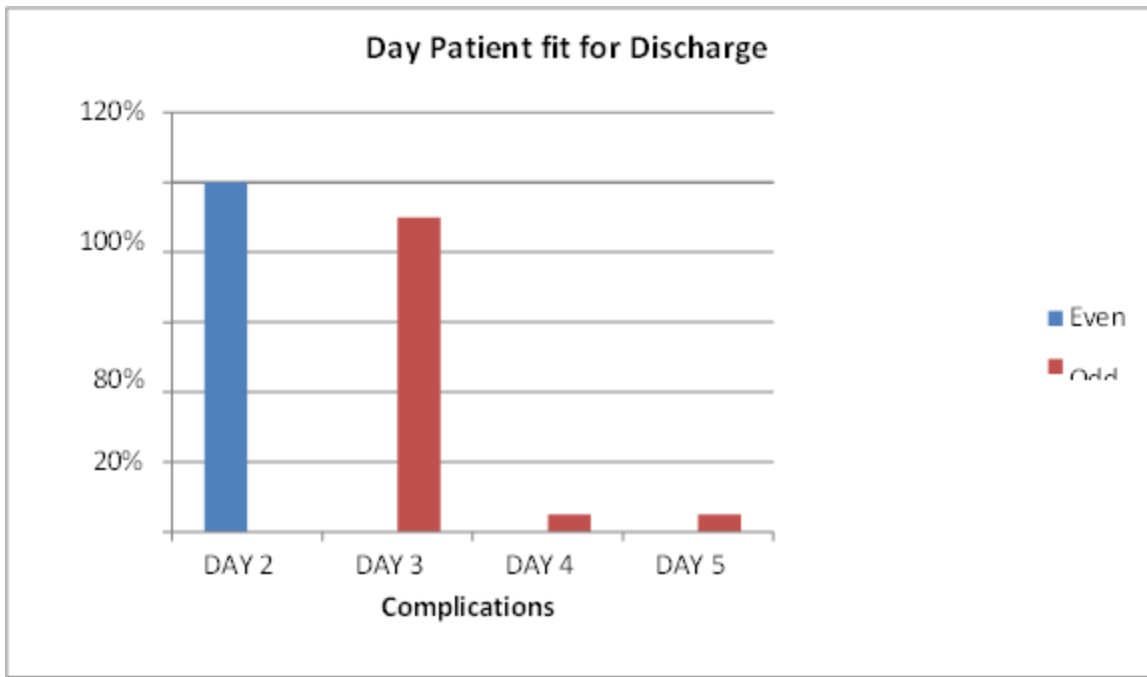


Figure 10: Bar diagram showing Day Patient fit for Discharge comparison between two groups

Table 10: Mean day of Fit for Discharge comparison between two groups

	Group	N	Mean	SD	P value
Day of Discharge	Even	20	2.00	0.0	<0.001*
	Odd	20	3.15	0.48	

Mean day of Fit for discharge in even group was 2.00 ± 0.0 days and in odd group was 3.15 ± 0.48 days. There was significant difference in day of discharge between two groups.

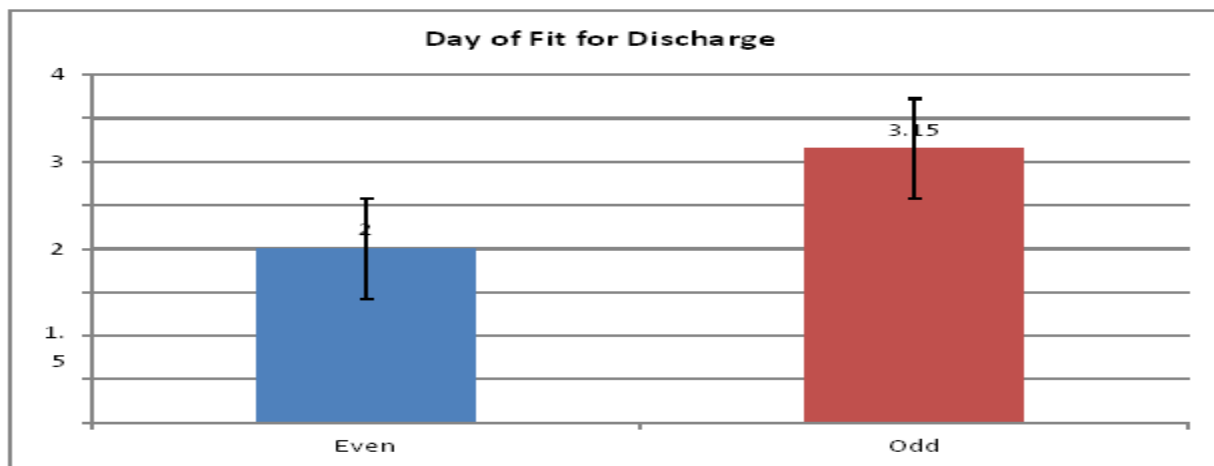


Figure 11: Bar diagram showing Mean day of Fit for Discharge comparison between two group.

Table 11: Cost effectiveness comparison between two groups

	Group	N	Mean	SD	P value
Cost of the Procedure	Even	20	6600	1313.89	<0.001*
	Odd	20	12400	1957.44	

Mean Total cost in the even group was 6600 ± 1313.89 Rs and in odd group was 12400 ± 1957.44. There was significant difference in cost of procedure between two groups. The cost of procedure for subjects under odd group i.e. Lichtenstein’s repair group was higher, probably due to the cost of mesh itself.

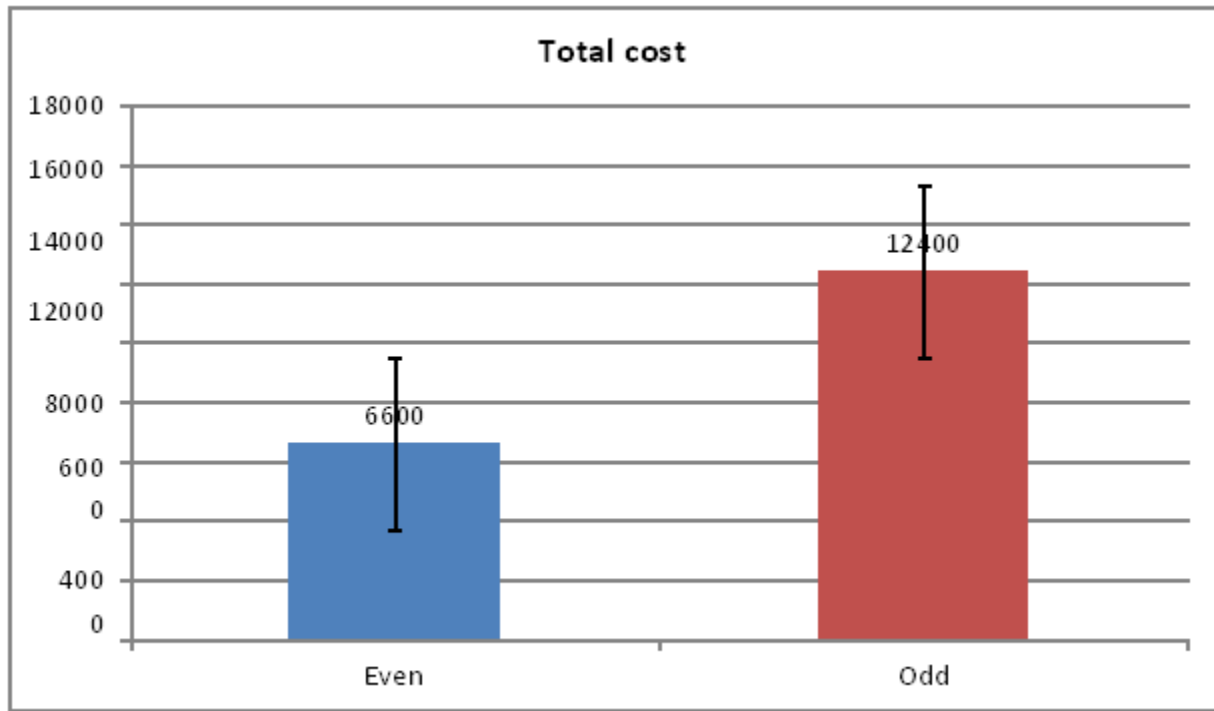


Figure 12: Bar diagram showing Cost effectiveness comparison between two group

DISCUSSION

Lichtenstein Mesh repair is now widely used, and is often referred to as the gold standard despite a relative paucity of clinical trial comparing mesh with suture repair. Cost of surgery and post-operative morbidity affecting the quality of life are important consideration in inguinal hernia surgery.

There are advantages and disadvantages associated with all types of open inguinal hernia surgery. Existing non prosthesis repair (Bassini/Shuldice) are blamed for causing tissue tension and mesh repair is blamed for causing complication of foreign body. In

Desarda’s repair an undetached strip of external oblique aponeurosis was sutured between muscle arch & inguinal ligament to give a strong & physiologically dynamic posterior wall⁴¹. The posterior wall of inguinal canal was weak & without dynamic movement in all patients. Strong aponeurotic extensions were absent in posterior wall. Muscle arch movement was lost or diminished in all patients. Movement of the muscle arch improved after it was sutured to upper border of a strip of external oblique aponeurosis (EOA). Newly formed posterior wall is kept physiologically dynamic by additional muscle strength provided by external

oblique muscle to the weakened muscles of arch. A physiologically dynamic & strong posterior inguinal wall, shielding & compression action of muscles & aponeurosis around inguinal canal are important factors that helps prevent hernia formation/hernia recurrence post repair. In addition, squeezing &

plugging action of cremastic muscle & binding effect of the strong cremastic fascia, also play a vital role in preventing hernia.14 Desarda’s repair result in a tension free repair without the use of any foreign body, it is also rather simple to perform.

Profile of subjects:

Table 12: Comparison of Age and sex distribution between various studies

Author	Year	Country	Group	No.	Total	Median age	Gender (M:F)
Present study	2019	India	Desarda	20	40	41.70 ± 13.48	20:0
			Lichtenstein	20		45.60 ± 14.10	20:0
Ahmed ⁴²	2018	Egypt	Desarda	65	130	38. ±11.55	61:4
			Lichtenstein	65		40±11.69	65:0
Abbas ⁴³	2015	India	Desarda	50	100	39.84±10.97	NA
			Lichtenstein	50		39.26±10.58	NA
Bhatti ⁴⁴	2015	Pakistan	Desarda	100	200	NA	NA
			Lichtenstein	100		NA	NA
Gedam ⁴⁵	2017	India	Desarda	92	187	49.75±18.02	91:1
			Lichtenstein	95		47.32±14.06	95:0
Manyilirah ⁴⁶	2012	Uganda	Desarda	50	101	40	46:4
			Lichtenstein	51		28.5	42:9
Sowmya ³⁶	2015	India	Desarda	20	40	46.6±16.2	NA
			Lichtenstein	20		44.1±12.9	NA
Szopinski ⁴⁷	2012	Poland	Desarda	105	208	50.2±17.5	NA
			Lichtenstein	103		54.1±15.3	NA
Youssef ⁴⁸	2015	Egypt	Desarda	71	143	45.97±10.69	69:2
			Lichtenstein	72		43.89±10.27	69:3
Zulu ⁴⁹	2016	South	Desarda	12	35	34	NA
		Africa	Lichtenstein	23		52	NA

From the above table it can be observed that Inguinal hernia is more common in Middle age group and among males. The present study findings were almost similar to the findings in other studies as mentioned above.

Diagnosis:

In Desarda group, majority of them had Right indirect hernia (45%) and in Lichtenstein group,

majority of subjects had Right direct and indirect hernia (35% respectively).

In the study by Prakash *et al.*, 50 of the 30 patients who underwent Desarda's repair, 33.3% patients with direct hernia & 66.7% patients with indirect hernia. Of the 30 patients who underwent Lichtenstein's mesh repair, 36.7% patients had direct hernia and 63.3% patients had indirect hernia.

Hence indirect inguinal hernia is most common hernia among adults.

Operating time

Mean operating time in present study of Desarda's group was 87.15 ± 3.86 min and in Lichtenstein group was 100.00 ± 5.39 min. There was significant difference in operating time between two groups.

In the study by Prakash *et al.*, 50 the average duration for Desarda No mesh repair was 45 minutes. The average duration for Lichtenstein's mesh repair was 50 minutes. The difference was statistically significant.

In the study by Ahmed *et al.*, 42 mean operative time for Desarda No mesh repair was

29 min and for Lichtenstein's mesh repair was 40 min. There was significant difference in operating time between two procedures.

Youssef *et al.* 48 report that Desarda repair had shorter operating time, early return to normal gait compared to Lichtenstein repair.

In the study by Abhishek Gupta *et al.*, 51 Mean Operative time in Desarda group was

28.24 minutes. The average duration for Lichtenstein's mesh repair was 30.88 minutes. The difference was statistically significant.

In the study by Neogi P, *et al.*, 52 Mean Operative time in Desarda group was 14.75 minutes. The average duration for Lichtenstein's mesh repair was 21.32 minutes. The difference was statistically significant.

From the review it can be observed that operative time were significantly shorter in Desarda group compared to Lichtenstein's mesh repair.

Post Op Pain:

In present study mean post op pain on day 1 in Desarda group was 2.95 ± 0.69 and in Lichtenstein group was 4.75 ± 0.79 . There was significant

difference in post op pain on day 1 between two groups.

Mean post op pain on day 3 in Desarda group was 1.15 ± 0.37 and in Lichtenstein group was 2.10 ± 0.31 . There was significant difference in post op pain on day 3 between two groups.

In the study by Prakash *et al.* 50 post op pain at 24 hrs was 5 in Desarda group and 6 in Lichtenstein group. At 7 days was 2 and 3 respectively. There was significant difference in Pain score between two groups on Day 1 and Day 7.

Other studies reported lower early post-operative pain in Desarda group however, it not reach significant level. 47,53 In contrast to Szopinski *et al* who reported higher early post-operative pain in Desarda group however in another publication by them they reported no significant difference. 54

In the study by Prakash *et al.*, 50 patients were classified into those who had groin pain for <3 days, 3-7 days, >7 days. 70% of the patients in the Desarda group experienced pain only for less than 3 days whereas 46.7% and 33.3% of the patients in Lichtenstein's method had pain for 3-7 days and more than 7 days respectively.

In the study by Abhishek Gupta *et al.*, 51 Mean VAS in Desarda group on 2nd POD was 3.12 while Lichtenstein had 3.73 which was significant ($p < 0.05$), on 1 week mean VAS in Desarda group 1.28 and Lichtenstein group was 2.07 was significant ($p < 0.05$) and mean VAS at 1 month in Desarda was 0.12 and Lichtenstein was 0.346 which was also significant ($p < 0.05$). 3 patients in Desarda group and 8 patients in Lichtenstein group had pain at the end of 1 month and was statistically significant ($p < 0.05$).

In the study by Neogi P *et al.*, 52 patients in Desarda group complained of less pain on 2nd day and pain at 1 week. In Lichtenstein group, post-operative pain on 2nd day was between 2 and 5 on visual analog scale (average VAS score = 3.51). It was between 1 and 3 on 1st week (average VAS = 1.91). In Desarda group, pain on 2nd day was between 2 and 5 (average VAS = 2.90). On 1st week, it was between 1 and 3 (VAS 1.37). It was found statistically significant. However, difference in average pain at 1 month was not significant. Also, the number of patients who complained of pain was also found insignificant. At 1 month, 9 patients complained of continuous pain

(VAS between 1 and 2) obviating to take analgesics in Lichtenstein arm and 5 patients complained of pain (VAS between 1 to 2) in Desarda arm. This observation of less intensity of pain score possibly confirms that the Desarda repair, as acclaimed by its inventor and others, is indeed a tension-free tissue repair.

Groin pain has been found to be due to fibrous reaction to foreign body in case of mesh repair, leading to spermatic cord and nerve entrapment, which affects the quality of life of the patient. Desarda's technique being a pure tissue repair, and hence no fibrous reaction to produce groin pain.

Post Op Complications:

In Desarda group, 0% had complications and in Lichtenstein group, 5% had Seroma and 10% had urinary retention. There was no significant difference in complications between two groups.

In the study by Prakash et al.,⁵⁰ none of the patients in the Desarda's repair group had seroma/hematoma. 1 patient (3.3%) in the Lichtenstein mesh repair had hematoma, whereas 4 patients (13.3%) had seroma. However, there was no significant difference in complications between two groups.

In the study by Abhishek Gupta et al.,⁵¹ no seroma and wound infection was observed in Desarda group but Lichtenstein group 4 seroma and 1 wound infection was observed, which was significant ($p < 0.05$). Abbas et al, also reported similar results, seroma formation rate 0% in Desarda and 1.4% in Lichtenstein repair.⁴³

In the study by Neogi P et al.,⁵³ less incidence of seroma formation in Desarda group (8.33% in Desarda compared to 25.53% in Lichtenstein group) which was found statistically significant. Abbas Z et al, reported rate of seroma formation rate 0% in Desarda and 1.4% in Lichtenstein repair.⁴³

Day of Fit for Discharge:

In Desarda group, 100% of patients were fit for discharge on day 2 and in Lichtenstein group, 90% were fit for discharge on day 3, 5% on day 4 and day 5. There was significant difference in day of discharge between two groups.

Mean day of fit for discharge in Desarda group was 2.00 ± 0.0 days and in Lichtenstein group was $3.15 \pm$

0.48 days. There was significant difference in day of fit for discharge between two groups.

In the study by Ahmed et al,⁴² time for return to basic activity was 1.15 days in Desarda group and 1.5 days in Lichtenstein group. There was significant difference between two groups. Return to work was 11 days in Desarda group and 15 days in Lichtenstein group.

Similarly, in the study by Prakash et al.,⁵⁰ the average duration of hospital stay was 4 days in case of Desarda's repair and 6 days in Lichtenstein's hernioplasty with a P value of 0.000 (highly significant).

Various studies show that Desarda's technique is associated with lesser duration of surgery, and lesser post op complications like groin pain, abdominal wall stiffness, duration of hospital stay and time to return to normal activity.^{32, 55, 56}

According to Desarda et al, average duration that was needed for the patients to return to work in the Desarda group was 8.26 days whereas it was 12.58 days in the Lichtenstein group. In the study by Prakash et al,⁵⁰ most of the people (63.3%) in the Desarda's group returned to normal activity within 7 days, when compared to Lichtenstein's group where the patients (60%) returned to normal activity within 7- 15 days. Hence Desarda procedure was more economical procedure compared to Lichtenstein repair.

Cost of Procedure:

Mean Total cost in the Desarda group was 6600 ± 1313.89 Rs and in Lichtenstein group was 12400 ± 1957.44 . There was significant difference in cost of procedure between two groups.

In the study by Abhishek Gupta et al.,⁵¹ Operative cost in Desarda group was 7700 Rs and in Lichtenstein group was 14780 Rs. There was significant difference in cost of procedure between two groups.

In the study by Neogi P et al.,⁵² Operative cost in Desarda group was 990 Rs and in Lichtenstein group was 4424 Rs. There was significant difference in cost of procedure between two groups.

Hence Desarda procedure was more economical procedure compared to Lichtenstein repair. External

oblique muscle technique satisfies all criteria of modern hernia surgery. Desarda's technique is simple & easy to do. It does not require risky or complicated dissection. There is no tension in suture line. It does not require any foreign material and does not use weak muscle or fascia transversalis for repair. It does not use mesh prosthesis so it is more economical and also avoid morbidity associated with foreign body like rejection, infection, chronic groin pain. Szopinski et al.,⁴⁷ stated in their Randomized controlled trial that the Desarda's technique has the potential to increase the number of tissue based method available to treat groin hernias. The most evident indication for use is the financial constraints or if a patient disagrees with the use of mesh.

CONCLUSION

This study is designed to compare the outcome of Lichtenstein tension free mesh repair and Desarda's repair. Though it requires studying a larger number of patients and a longer follow up, based on results of our study the following conclusions are drawn:-

1. The Desarda procedure required lesser operative time compared to Lichtenstein repair.
2. Post Operative pain on Day 1 and Day 3 was significantly lower in Desarda procedure compared to Lichtenstein repair.
3. No complications were seen in Desarda group, where as 15% of subjects undergoing Lichtenstein repair reported complications.
4. Patient was fit for discharge much earlier in Desarda group compared to Lichtenstein repair.
5. Desarda's technique is cost effective when compared with Lichtenstein method, so can be useful in rural setup where financial constraint is a major concern.

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