SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://saspjournals.com/sasjs/

OPEN ACCESS

Randomized Control Study between Desarda Repair and Lichtenstien Mesh Repair for Inguinal Hernias

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Original Research Article

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Article History
Received: 14.12.2018
Accepted: 26.12.2018
Published: 10.01.2019

DOI: 10.21276/sasjs.2019.5.1.1

Abstract: ***Background:*** The standard repair for inguinal hernia is yet to be defined. Desarda repair for inguinal hernia is a tissue based no mesh repair, with better outcomes. The Objective of the study is to compare the short term outcomes between Lichtenstein's and Desarda technique in inguinal hernia repair. To study the short term outcome in the following ways: Operating time, Postoperative pain , Post op wound infection rate, Cost of procedure in total .To look for any chronic pain with regular follow ups at three months and six months. ***Material and Methods:*** Patient presenting to KIMS Hubballi with inguinal hernia during the period from November 2016 to September 2017. Data collected by history taking, meticulous physical examination and relevant investigation. Post-operative pain was analysed on post-operative day 1,3,7 and Chronic pain at 3 months and 6 months. ***Results:*** During follow up, no patient had chronic pain from Desarda's Group, zero from Lichtenstein Group (P= 0.00) There was significantly less Post-op pain in both the study groups. There was no seroma formation in both the Groups. Desarda's Procedure was also cost effective. ***Conclusion:*** The results of primary inguinal hernia repair with the Desarda and Lichtenstein techniques are comparable at the 6 months follow-up, further larger study group is required to conclude.

Keywords: Desarda repair, Lichtenstein repair, Post-operative pain. VAS score, Seroma, Chronic pain

INTRODUCTION

The surgical treatment of inguinal hernias has evolved through several generations to reach a modern era. It has been said that the history of groin hernia is history of surgery itself [1].

Bassini revolutionized the surgical repair of the groin hernia with his novel anatomical dissection and low recurrence rates in 1884. Darn repairs were first introduced in the early 20th century to reduce wound tension by using either autologous tissue or synthetic suture to bridge the gap between fascial tissues. Muscle and fascial flaps were attempted without consistent success [2].

Francis Usher in 1958 used polypropylene as first successful synthetic prosthesis. The tension free concept got its breakthrough with Irving Lichtenstein who used polypropylene meshes for suturing [3]. Prolene Hernia System is a novel device developed for tension-free repair of inguinal hernia. Till date there are a lot of reconstructive procedures in management of inguinal hernias like the Bassini's repair, the Shouldice repair, the Lichtenstein tension free repair, various types of meshes and laparoscopic repairs.

Since the time bassini described this technique the search for an ideal inguinal hernia repair is still on. An ideal hernia repair should be tension free, Tissue based, with no potential danger to vital structures, any chronic pain or complication and recurrence.

Though Lichtenstein's prosthetic repair using prolene mesh has been popular lately, it is not a tissue based repair and hence cannot be considered ideal. Though this method of hernia repair is simple and safe, the slightest movement of the mesh from the sutured area is leading cause of failure of mesh repair of inguinal hernias. Mesh works as a mechanical barrier. It does not give mobile and physiological dynamic posterior wall [4]. Moreover this technique is associated with chronic pain and testicular atrophy and infertility [5].

Suture repair for inguinal hernia is recently been described by Mohan Desarda where a 1-2cm strip of external oblique muscle aponeurosis lying over the inguinal canal is isolated from the main muscle but attached both medially and laterally. It is then sutured to the conjoint tendon and inguinal ligament, reinforcing the posterior wall of inguinal canal. As the abdominal muscles contract, this strip of aponeurosis tightens to add further physiological support to posterior wall. This operation is currently being evaluated [6].

This new technique is theoretically closer to ideal hernia repair. It is based on the concept of providing a strong, mobile and physiologically dynamic posterior inguinal wall. The technique is simple, easy to learn and do. It does not require any foreign material and does not use weakened muscles or transversalis fascia for repair. The results are superior to those previously published in the field of hernia surgery [7-9].

Success of groin hernia repair is measured primarily by the permanence of the operation fewer complications, minimal costs, and earliest return to normal activities. To validate the use of the desarda's repair at large, its comparison to the open mesh (Lichtenstein) in these outcomes must be established. The purpose of this study is thus to attempt to establish the influence of this new technique on early clinical outcome of inguinal hernia, and limited study of long term outcomes. If proved to be effective it will be basis for the promotion of its use globally.

MATERIALS AND METHODS

The study is a prospective study of patients admitted in Karnataka Institute of Medical Sciences, Hubli, from October 2016 to September 2017, with the diagnosis of inguinal hernia. Informed consent has been obtained from all the patients and the study protocol has been approved by the college ethics committee.

Inclusion criteria -All cases of uncomplicated inguinal hernia admitted for surgery

- Above 18-70 years of age.
- Unilateral or bilateral primary, reducible inguinal or inguino-scrotal hernia.

Exclusion criteria

- Patients with strangulated hernia.
- Per operative finding of separated, thin and/or weak external oblique aponeurosis.

Study Method

The study consists of two groups, with 32 patients in Desarda and 32 patients in Lichtenstein group. A detailed history has been taken and a thorough examination was made and cases were studied as per the proforma attached. Routine blood investigations are done. Following this, patients were allocated into two groups as per the availability of the mesh and preference of the patient. All surgeries were performed by different surgeons in the department of General Surgery.

Anesthesia and Procedure

All surgeries were performed under subarachnoid block. Patient was placed in supine position and all the patients were catheterized. Surgeon stands on the side of inguinal hernia during surgery. Intra operative findings, mesh used and the duration of surgery starting from the point of skin incision to skin closure are noted. A dose of intravenous ceftriaxone 1 gm is given to all patients intraoperatively.

Post Operative Management

All the patients received 2 days of intravenous ceftriaxone 1 gm twice daily and Intramuscular Diclofenac 75 mg was given twice daily for analgesia and antiemetics were given if required. After one day patients were put on oral ciplofloxacin 500mg twice daily if required and oral diclofenac tablets as and when required. All the patients were allowed liquids followed by semisolids 6 hours after surgery. Dressings are opened on third post-operative day and inspected for collections (seroma, hematoma) and any signs of infections.

Folllow up evaluation

All the patients were advised to get discharged from the second post-operative day, unless any complications were noted. All the patients were advised to avoid heavy weight lifting. They were followed up on days1, 3,7 and at 3 months. Phone numbers were collected from all patients and contacted regularly for patients who did not turn to hospitals.

Assessment of post-operative pain

The pain experienced by the patients in the post-operative period has been graded according to the Visual Analog Scale (VAS) on day 1, day 3, and on day 7. Visual analog scale consists of a 10 cm line anchored at one end by a label as no pain and at the other end by a label as severe pain. The patient as to point on the scale the amount of pain him currently experiencing. Urinary retention in immediate pot-operative period was treated with placement of indwelling catheter removed after 24hrs. This was done to prevent confounding with pain.

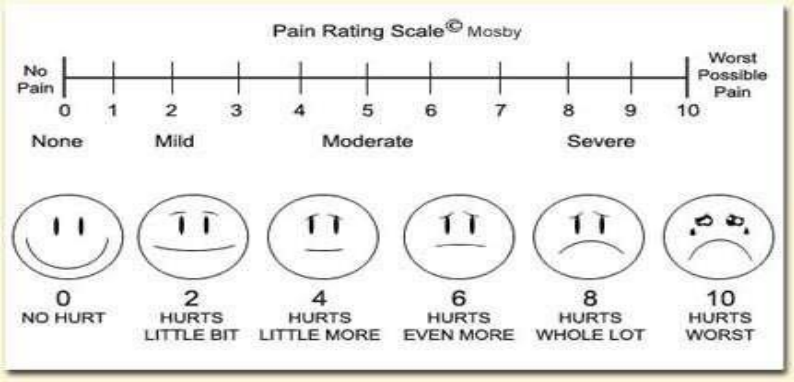

Fig-1: Visual Analog Scale (VAS Score)

Statistical Analysis

Data was entered into Microsoft Excel sheet and Statistical analysis was done using IBM SPSS Statistics 25.0 software. Significance was assessed at 5% level of significance.

RESULTS

For statistical analysis, all the patients were divided into two groups

- Cases- patients in whom Desarda repair was done
- Controls- patients in whom Lichtenstein mesh was used.

The two groups were compared in terms of duration of surgery; post-operative hospital stay; post-operative pain, seroma and wound infection; chronic groin pain.

Sex Distribution

Table-1: Comparison of cases and controls by sex distribution

Gender	Desarda group		Lichtenstein repair group	
	n	%	n	%
Male	19	95	21	100
Female	1	5	0	0
Total	20	100	21	100
Chi square value: 1.08 P value:0.298 (Not significant)				

In the study group, 31 male patients and 1 female patient were studied and in Control group 32 male patients were studied.

Age Distribution

Age ranged between 20 to 68 years among patients undergoing Desarda group and 20 to 75 years in Lichtenstein group. Mean (SD) age in Desarda group was 42.9 (14) years and in Lichtenstein repair group was 45.2 (16.1) years. There was no significant difference in the age in both the groups.

Table-2: Age distribution of patients studied

Age categories (years)	Desarda group		Lichtenstein repair group	
	n	%	n	%
21-30	7	35	4	19
31-40	7	35	5	24
41-50	1	5	4	19
51-60	1	5	5	24
>60	4	20	3	14
Total	20	100	21	100
Chi square value: 1.67 P value:0.796 (Not significant)				

Duration of Surgery

The mean duration of the total surgery in Desarda group was 52±7.9 while that in Lichtenstein group was 55.24 ±4.8. There was no statistical significant difference between two methods.

Table-4: Duration of surgery between both study groups

Duration of surgery (mins)	Mean	SD	P value
Desarda group	52	7.9	
Lichtenstein repair group	55.24	4.02	0.110
Independent t test- P value(Not significant)			

Post Operative Pain (POP)

On POD 1 the mean VAS in Desarda group was 6.05±0.86, while that in Lichtenstein Group was 6.24±0.78 though the difference is small it is still statistically significant with a P value 0.364**.**

Table-5: Post-Operative Pain in Two Groups of Patients on Day 1

VAS (Day1)	Mean	SD	P value
Desarda group	6.05	0.686	
Lichtenstein repair group	6.24	0.625	0.364
Independent t test- P value(not significant)			

Table-6: Post-Operative Pain in Two Groups of Patients on Day 3

VAS (Day 3)	Mean	SD	P value
Desarda group	4.4	0.821	
Lichtenstein repair group	4.05	0.805	0.173
Independent t test- P value(Not Significant)			

Table-7: Post-Operative Pain in Two Groups of Patients on Day 7

VAS (Day 7)	Mean	SD	P value
Desarda group	1.45	0.759	
Lichtenstein repair group	1.0	0.707	0.057
Independent t test- P value(Not Significant)			

On POD 3 the mean VAS Score in Desarda group is 4.4±0.821, while that in Lichtenstein Group was 4.05±0.805 this difference is minimal and which is statistically insignificant with P Value 0.173

On POD 7 the mean VAS score in Desarda groups was 1.29±0.78, while that in Lichtenstein group was 1.0±0.75 this difference is also minimal and which is statistically insignificant with P value 0.057

Overall Desarda Group experienced less pain compared to Lichtenstein Group.

Post Operative Seroma Formation

Table-8: Post-Operative seroma formation

Seroma formation	Desarda group		Lichtenstein repair group	
	n	%	N	%
Yes	0	0	0	0
No	20	100	21	100
Total	20	100	21	100
Chi square value: 0.00 P value:0.00 (Not significant)				

There was one patent with Seroma formation in Desarda group and no cases in Lichtenstein Group, After Statistical Analysis it was found to insignificant with P value 0.000.

There was no wound infection /Mesh infection in either of the Groups.

Chronic groin pain

Table-9: Chronic Pain between Two Groups of Patients at 3 months

Chronic pain at 3 months	Desarda group		Lichtenstein repair group	
	n	%	n	%
Yes	0	0	0	0
No	20	100	21	100
Total	20	100	21	100
P value:0.000 (Not significant)				

Table-10: Chronic Pain between Two Groups of Patients at 6 months

Chronic pain at 6 months	Desarda group		Lichtenstein repair group	
	n	%	n	%
Yes	0	4.3	0	0
No	20	100	21	100
Total	20	100	21	100
P value:0.000 (Not significant)				

DISCUSSION

Inguinal hernia is a very common condition afflicting mankind [10]. All inguinal hernias share the common feature of emerging thorough the myopectineal orifice of furchaud. Lichtenstein hernia repair is the widely practised repair for most of the inguinal hernia with very few exceptions. It is used as Gold standard surgery for all types and size of inguinal hernia, though it is far from the definition of an ideal hernia repair and has complications like chronic inguinal pain. Nerve entrapment within the mesh is often blamed for this consequence. Several other complication of Mesh repair include Haematoma, seroma, ischemic orchitis, testicular atrophy, Mesh infection and sinus formation [11].

Desarda procedure might be the ideal procedure satisfying the criteria for an ideal hernia repair as it is tension free, tissue based and as per results of various studies has less chronic groin pain than mesh repair as nerve entrapment does not occur. There is no risk of mesh infection as it uses an undetached strip of external oblique for repair. external oblique aponeurosis acts as a near perfect mesh alternative as it has negligible foreign body reaction, causes no pathologic fibrosis, has low adhesion potential, has tensile strength> 16N [12], is of biological origin and matches the abdominal wall dynamics as closely as possible in flexibility, elasticity and memory as per the criteria laid down by 30th international Congress of the European Hernia Society. This procedure if proved successful can be used extensively in all types of hernias where the external oblique aponeurosis is well preserved. The present study was carried out at Karnataka institute of Medical sciences comparing these two procedures in various clinical scenarios and comparing the outcome in immediate post-operative period and by following up these patients for 6 months. The results were analysed and compared to various other studies dine in this field.

Operating Time

The mean time difference between the two groups with respect to operative time in the current study is 3 minutes. Though the duration of surgery was comparatively shorter in the desarda group, both the Groups are comparable.

In the study by Manyilirah *et al*. which found a time difference of 12 minutes. This showed a significant time advantage [13].

In the study by Youssef T *et al*. also found operative time significantly less 59.4±6.3 min compared to Lichtenstein (72±12.2 min)[14].

Pain Assessment

In our Study we used Visual Analog Scale for Assessment of pain, There was no statistically significant differences in Postoperative pain on POD1 following surgery with lesser pain in Desarda group. The mean VAS score in Desarda Group was 6.057, while in Lichtenstein were 6.24.

On POD 3 the mean VAS Score in Desarda group is 4.4, while that in Lichtenstein Group was 4.05 this difference is minimal and which is statistically not significant.

On POD 7 the mean VAS score in Desarda groups was 1.45±0.78, while that in Lichtenstein group was 1.0 this difference is also minimal and which is statistically not significant.

In the study by Manyilirah *et al*. the pain showed an uptrend on POD3, with the mean pain on POD3 in Desarda Group was 2.73±1.64, while in Lichtenstein was 3.33 ± 1.75.

In the study by Szopinski J *et al*. only POD 2 pain was taken into consideration and it was one point higher than in the current study in both groups [15].

In the study by Neogi P *et al*. the pain showed decreasing trend with Mean pain score on POD 2 and POD 7 was 2.90 and 1.37 in Desarda Group and 3.51& 1.91 in Lichtenstein Group Respectively [16].

Comparison Of Complications

Among the post-operative complication in the present study Seroma rate was comparable in both study groups.

Table-11: Comparison of complication with other studies

Comparative Parameter (M vs NM)	Present study	Manyilirah *et al*.	Szopinski J *et al*.
Seroma Rate	0% vs 0%	-	3.8% vs 5.8%
Rate of Wound Infection	0% vs 0%	0% vs 0%	0.9% vs 1.9%
Scrotal Swelling	0% vs 0%	7.8% vs 8.0%	7.7% vs 9.7%
Hematoma	0% vs 0%	3.9% vs 2%	7.7% vs 6.8%

Chronic pain

With the incidence of recurrence being stabilised since the introduction of tension free repairs, the focus has somewhat shifted to the occurrence of chronic groin pain. Different case series report varied incidence of chronic groin pain and it is difficult to exactly pinpoint the cause for the same. In our study, no patients had chronic pain at the end of 3 and 6 months

In the study by M P Desarda *et al*. chronic pain after 6 months was seen in 7.8% patients of Lichtenstein Group and 0% in Desarda group. At the end of 1 year 6.4% of patient of Lichtenstein Group and no patient in Desarda group had chronic pain [17].

In the study by Youssef *et al*. Chronic pain at 6 months was 5.6% in Desarda group and 4.2% in Lichtenstein group.

CONCLUSIONS

The study was developed to compare Desarda and Lichtenstein type of inguinal repair. Though it requires studying large number of patients and longer follow up period, based on the results of our study following conclusions can be drawn.

- The Desarda and Lichtenstein methods of primary inguinal hernia repair do not differ much in the means of procedure, complexity and operative time.
- The numbers of the local complication were less in the Desarda group compared to Lichtenstein group, and require larger study.
- There was decreased post-op pain on in the Desarda group compared to Lichtenstein group and patients ambulate faster and get discharged early with this technique.
- Desarda technique is inherently free of risk of mesh infection as no prosthesis is used in Desarda technique.
- There is a comparable result for chronic pain between both the groups.
- There was no recurrence after follow upto 6 months in both the groups however the data is insufficient in our study but 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 technique is definitely more cost effective than Lichtenstein's repair as no mesh is used.
- Desarda technique is definitely a promising procedure and has a lot of potential to replace mesh repair in certain condition and is best suited for situations like strangulated hernias where mesh is use is contraindicated.
- More number of randomized control trails and multicentre trails need to be undertaken to study the pros and cons of this procedure in future.

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