



A COMPARATIVE STUDY OF TENSION FREE INGUINAL HERNIORRHAPHY USING EXTERNAL OBLIQUE APONEUROSIS [DESARDA] VERSUS LICHENSTEIN TECHNIQUE FOR PRIMARY INGUINAL HERNIA REPAIR

General Surgery

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ABSTRACT

Background: The most common surgical entity encounter is the groin hernia out of them inguinal hernia is main surgical problem. And for this various surgical techniques evolved from many years. The Lichenstein technique is considered to be the surgery of choice. But this technique has its own limitations in terms of postoperative pain, foreign body sensation, postoperative complications, cord fibrosis etc. Desarda technique is newly raised technique in terms of its feasibility, low cost and less recurrence rate. **Methods:** The hospital based prospective randomized control interventional study from period January 2019 to June 2020 on 240 patients of either gender and meeting inclusion criteria of which 120 selected for non mesh group and 120 for mesh group. Aim was to find out better surgical technique for primary inguinal hernia repair between the Desarda and Lichtenstein methods and objective to compare the mean operative time, mean hospital stay, postoperative pain and complications like recurrence, seroma, hematoma. **Results:** Results developed after completion of study shows the mean hospital stay in non-mesh group was 1.72+ 0.829 and in mesh group was 2.66+ 0.68. For evaluation of pain the mean Visual analog score pain score at 7th day in non mesh group was 0.16+ 0.42 and in mesh group was 0.46+ 1.01, on 30th day mean pain score in non mesh group was 0.00+ 0.00 and in mesh group was 0.19+ 0.57 with difference of 0.192 with p value<0.005. There were no recurrence found in both groups up to 6 month however longer follow up required, and return to normal activity in terms of number of days not statistically significant. **Conclusions:** The technique of Desarda is tension free herniorrhaphy which is do not required any foreign body like mesh and typical posterior wall dissection so easy to perform. It is superior to lichenstein in terms of less mean operative time, less mean hospital stay and in terms of postoperative pain. However no recurrence was observed in both groups during study.

KEYWORDS

Desarda technique, Inguinal hernia repair, Postoperative complications

INTRODUCTION

The surgical treatment of inguinal hernias has evolved through several stages to reach a modern and successful era it has been said that the history of groin hernia is the history of surgery itself^[1]. Despite the frequency of this procedure, no surgeon has ideal results, and complications such as postoperative pain, nerve injury, infection and recurrence continue to challenge surgeons^[2].

As a result of the introduction of tension free surgical techniques, more importance has been given to their outcome in terms of patient postoperative pain, length of hospital stay and quality of life^[3]. Since recurrence rates have been reduced with mesh repairs, outcome research in groin hernia repair has recently focused on the chronic pain. Chronic pain adversely affects daily life 5-10% of patients^[4,5]. The intensity of acute pain after herniorrhaphy is related to the risk of developing chronic postoperative pain^[6].

Several techniques have been employed in the treatment of inguinal hernias, since Bassini first described his method in 1887. The technique range from the tissue repairs such as modified Bassini, Iliotibial tract repair, Shouldice, Nylon Darn, Halsted Tanner and McVay, to the Tension free Herniorrhaphies that involve the use of a mesh implant^[7].

Despite the large armamentarium available for the treatment of this common condition, no surgeon has ideal results, and complications such as postoperative pain, nerve injury, infection and recurrence continue to challenge surgeons^[2].

The Physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis (Desarda's technique) of inguinal hernia repair acclaimed by its developer, Prof Desarda, who has used it since 1990, seeks to get over the challenges faced with the use of the tension tissue repair and mesh repair techniques. 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 easy to do. It does not require complicated dissection or suturing. There is no tension on the suture line. It does not use 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^[6,7,8].

To validate the use of the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis, its comparison to the open mesh (Lichtenstein) the criterion standard must be established. The purpose of this study is to attempt to establish the influence of the new technique on early clinical outcomes of inguinal hernia repair.

METHODS

The study will be a hospital based Prospective Randomized Control Interventional Study conducted in JLN Medical College & Attached Group of Hospital, Ajmer General Surgery Department in period from March 2019 to April 2020 on total 250 patients, 125 in each group.

Ethical committee approved study. Informed consent was taken from all the participating patients after explaining the purpose of the study. All patients age 18 years and above with non-complicated inguinal hernia were eligible for the study. Patients below 18 years, complicated, recurrent inguinal hernia and patients found to have thin, weak or divided external oblique aponeurosis intraoperatively were excluded from the study.

The data was collected as regard operative time in minutes calculated from skin incision to skin closure, hospital stay in hours, post-operative pain was measured by VAS score on day 1st, 7th and day 30th, time taken to return back to routine work in days, post-operative complications like chronic groin pain, foreign body sensation, recurrence during follow up period. Follow up record was collected from the OPD and ward during post-operative period on 7th day, 30th day, 3rd month, 6th month, 1 year. Visual analogue scale (VAS) scored as 0- least pain, 10- maximum pain, 5- moderate pain. Chronic groin pain defined as VAS score >5 for 3 months. Return back to basic activities was described as the patient's ability to perform basic activities (getting up from bed, walking without any support by himself) at home is calculated in hours and days. Analytical statistics-continuous variables were presented as Mean and Categorical variables were expressed in actual numbers and percentages. The operative technique of this new repair method was followed as described by Desarda.

The standard groin incision (oblique) measuring 5 to 7.5 cm given..

Than external oblique aponeurosis and superficial inguinal ring exposed. The thin, filmy fascial layer covering it was kept undisturbed as far as possible and an assessment made about the strength of it and its thinned out portion.

The external oblique will cut in line with the upper crux of the superficial ring, which leaves the thinned out portion in the lower leaf so a good strip can be taken from the upper leaf.

Than spermatic cord along with its structures and sac lifted and dissected and sac inverted back.

The medial leaf of the external oblique aponeurosis will sutured with the inguinal ligament from the pubic tubercle to the abdominal ring using 2-0 polypropylene continuous sutures. A splitting incision will made in this sutured medial leaf, partially separating a strip with a width not more than 2cm. The upper free border of the strip will now sutured to conjoined muscle lying close to it with 2-0 polypropylene interrupted sutures. This resulted in the strip of the external oblique being placed behind the cord to form a new posterior wall of the inguinal canal.

Lateral leaf of the external oblique will sutured to the newly formed leaf of the external oblique in front of the cord, using 2-0 polypropylene continuous sutures. Adequate hemostasis achieved. Skin closure done and dressing applied.

RESULTS

Hernia repair time in non-mesh group was ranging 12-18 minutes, whereas Hernia repair time the mesh group was ranging 15-26 minutes.

The mesh repair took longer time to accomplish with a difference of 5.36 minutes (95% CI = 5.92 to -4.79) compared to the non-mesh repair and the differences was statistically significant ($P < 0.0001$). The participants in the non-mesh group were operated within range of 39 – 45 minutes, whereas those in the mesh group were operated within 46-53 minutes. Total operation time in mesh group also took longer to accomplish with a difference of 7.57 minutes (95% CI = -7.95 to 7.20) compared to the non-mesh repair and the difference was statistically significant ($P < 0.0001$). (Table 1)

The mean hospital stay in Group A (non-mesh) was 1.72 ± 0.829 days where as in Group B (mesh) was 2.66 ± 0.68 days. The mean hospital stay in non-mesh group was shorter by a difference of 0.94 days (95% CI = -1.13 to -0.75) than the mesh group which was statistically significant (p value < 0.0001). (Table 2)

The mean of return to daily activity in Group A (non-mesh) was 7.76 ± 1.07 days where as in Group B (mesh) was 12.29 ± 1.04 days. The mean of return to daily activity in non-mesh group was shorter by a difference of 4.52 days (95% CI = -4.79 to -4.26) than the mesh group which was statistically significant (p value < 0.0001) (Table 3)

On 7th day, the mean pain score in non-mesh group was 0.16 ± 0.42 and in mesh group it was 0.46 ± 1.01 the mean pain score was lower in non-mesh group with a difference of 0.304 [95% CI = (-0.497 to 0.11)].

On 30th day, the mean pain score in non-mesh group was 0.00 ± 0.00 and in mesh group it was 0.19 ± 0.57 the mean pain score was lower in non-mesh group with a difference of 0.192 [95% CI = (-0.293 to 0.0902)].

After 6 months, the mean pain score in non-mesh group was 0.00 ± 0.00 and in mesh group it was 0.06 ± 0.24 the mean pain score was lower in non-mesh group with a difference of 0.06 [95% CI = (-0.107 to 0.021)].

There was statistically significant difference in mean pain scores between the two intervention groups ($P < 0.05$) after 7th day, 1 month and 6 months of operative procedure.

MEAN OPERATIVE TIME {Table 1}

MEAN OPERATIVE TIME	GROUP A	GROUP B	DIFFERENCE (95% CI)	P VALUE*
HERNIA REPAIR TIME (MIN)	13.94 + 1.207	19.3 + 2.96	-5.36 (-5.92 to -4.79)	<0.0001

TOTAL TIME (MIN)	41.97 + 1.52	49.54 + 1.48	-7.57 (-7.95 to -7.20)	<0.0001
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* Computation of P values based on Student's t-test.

MEAN HOSPITAL STAY {Table 2}

	GROUP A	GROUP B	DIFFERENCE (95% CI)	P VALUE*
MEAN HOSPITAL STAY (DAYS)	1.72 + 0.829	2.66 + 0.68	-0.94 (-1.13 to -0.75)	<0.0001

* t-Test : Two –sample Assuming Unequal Variances.

RETURN TO DAILY ACTIVITY {Table 3}

	GROUP A	GROUP B	DIFFERENCE (95% CI)	P VALUE*
RETURN TO DAILY ACTIVITY (DAYS)	7.76 + 1.07	12.29 + 1.04	-4.52 (-4.79 to -4.26)	<0.0001

POST OPERATION PAIN {Table 4}

PAIN SCORE (VAS)	GROUP A NON-MESH (Mean + SD)	GROUP B NON-MESH (Mean + SD)	DIFFERENCE (95% CI)	P VALUE*
7th DAY	0.16 + 0.42	0.46 + 1.01	-0.304 (-0.497 to 0.11)	0.002 (S)
1 MONTH	0.00 + 0.00	0.19 + 0.57	-0.192 (-0.293 to 0.0902)	0.002 (S)
6 MONTHS	0.00 + 0.00	0.06 + 0.24	-0.06 (-0.107 to 0.021)	0.002 (S)

* Computation of P values based on Student's test.

DISCUSSION

This study was designed to establish the short-term clinical outcomes of hernia repair using the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis, a non-mesh tissue-only repair, which is acclaimed to be able to restore the normal physiology of the inguinal canal as compared to the mesh-based repairs. It is also reported to be free of common postoperative complications normally associated with mesh repairs and other tension tissue repairs such as the Lichtenstein and modified Bassini methods respectively. In this study there was statistically significant difference between the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis and Lichtenstein methods in regard to postoperative pain scores, mean hospital stay and return to daily activities.

The mean hernia repair time in this study was taken as the duration of actual repair technique, from the end of herniotomy or sac reduction to the time of placement of the last stitch of repair. The mean total operative time was taken from skin incision to skin closure.

19.3 $\pm$ 2.96 minutes for mesh group [effect size (95% CI): -5.36 (-5.92 to -4.79)]. This was found to be statistically significant ($P < 0.0001$). These results were comparable with study conducted by Manyilira W (Manyilira W et al 2012).

The Mean total operative time were 41.97 ± 1.52 minutes for non-mesh group and 49.54 ± 1.48 minutes for mesh group [effect size (95% CI): -7.57 (-7.95 to -7.20)]. This was also found to be statistically significant ($P < 0.0001$).

Mitura K et al (2008) calculated total operative time only and found longer total operative time in Lichtenstein technique, which were comparable with present study. However total operative time was longer in both groups in the study conducted by Mitura K et al compared to the present study. The mean hospital stay in Group A (non-mesh) was 1.72 ± 0.829 days where as in Group B (mesh) was 2.66 ± 0.68 days.

The mean stay in non-mesh group was shorter by a difference of 0.94

days (95% CI): $-(-1.13 \text{ to } -0.75)$ than the mesh group (p value <0.0001) which was statistically significant.

The findings in the present study are comparable to study done by **Desarda and Ghosh (2006)** where the mean stay in the non-mesh repair technique was 1.22 ± 0.89 days while it was 3.59 ± 1.93 days in the mesh group.

The mean of return to daily activity in Group A (non-mesh) was 7.76 ± 1.07 days where as in Group b (mesh) was 12.29 ± 1.04 days.

The mean of return to daily activity in non-mesh group was shorter by a difference of 4.52 days (95% CI = $(-4.79 \text{ to } -4.26)$ than the mesh group (p value <0.0001) which is comparable to the study done by **Desarda and Ghosh (2006)**^[9] where the mean time to return to work in the non-mesh technique was 8.48 ± 2.43 days while it was 12.45 ± 2.11 days in the mesh group.

Pain was scored on a visual analogue scale of 0 to 10. The pain experienced by the participants in the two study arms was different at three time points (7th day, 1 month and 6 month). The mean pain score was highest on the 7th postoperative day in both arms. The explanation for the higher scores on the 7th postoperative day could be because the postoperative inflammatory process is at its peak as compared to the rest of the pain assessing time.

The overall trend showed lower scores among the Non-mesh group at each point of time, which was statistically significant ($P < .005$). In present study the mean pain scores on 7th post op day after surgery were 0.16 ± 0.42 for non-mesh group and 0.46 ± 1.01 for mesh group [effect size (95% CI : -0.304 (-0.497 to 0.11)). No Patient in the non-mesh group had pain at 1 month post-operative day whereas 11 participants (8.8%) reported pain score (VAS) 2 and 2 (1.6%) participant reported pain score (VAS) on the 30th postoperative day in mesh group. This was comparable with study conducted by Desarda and Ghosh (2006).^[9]

Table 5

Study	Manyilira W et al (2012)		Mitura K et al (2008)		Present study	
	NON-MESH	MESH	Group I (Desarda)	Group II (Lichtenstein)	Group A NON-MESH	Group B MESH
Hernia repair time (min.)	10.02 + 2.93	3.52	*		13.94 + 1.207	19.3 + 2.96
Total operation time min.	*	*	56.6	66.5	41.9 + 1.52	49.54 + 1.48

CONCLUSIONS

This study has shown that the efficacy of the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis technique in respect of influencing the short-term outcomes of hernia repair is comparable to those of Lichtenstein method.

The most evident indications for use of the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis technique included use in young patients, in contaminated surgical fields, in the presence of financial constraints or if a patient disagrees with the use of mesh. In the operator's hands, the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis was shown to take a significantly shorter operative time and total operation time than the Lichtenstein repair. This in the face of resource constraints should make surgeons consider the physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis technique as a more cost effective method. The tissue based technique scores over the lichtenstein mesh repair as far as decreased mean hospital stay and early return to daily activities are concerned.

This study affirmed the fact that in patients with hernias, judicious and meticulous approach to the mobilization and resection of the sac should be observed irrespective of the technique of hernia repair used. Surgery in these patients is attended by more post-operative pain,

increased intra-operative and postoperative complications. The follow up period in the current study is relatively short, a longer follow up may be needed before any further conclusion can be made. However it is still wise to recommend physiologically dynamic tension free inguinal herniorrhaphy using external oblique aponeurosis as a reasonable option to Lichtenstein inguinal hernia repair.

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