

A COMPARATIVE STUDY OF DESARDA REPAIR FOR INGUINAL HERNIA WITH ABSORBABLE VERSUS NON ABSORBABLE SUTURE MATERIAL

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ABSTRACT

Background: Desarda Repair is a tension free mesh free pure tissue based repair for Inguinal hernia. Both absorbable and non absorbable suture materials are being used for suturing the strip of external oblique aponeurosis to arch fibers to strengthen the posterior wall of inguinal canal. But on using a non absorbable suture material the aim of overcoming the use of foreign body for hernia repair is not achieved. Hence in our study by using a absorbable suture material we are completely overcoming the placement of foreign body in the inguinal region. **Aims and Objectives:** To compare the short term outcomes of Desarda Repair of Inguinal Hernia using Absorbable and Non Absorbable Suture Material. **Materials and Methods:** Prospective Randomized Control Study conducted in Department of General Surgery, BGS global institute of medical sciences, Bengaluru . A total of 50 patients with primary Inguinal hernia (both direct and indirect) were included in this study and operated during the period of June 2023 to June 2026. These patients were grouped into two groups of 25 each. Group A patients underwent Desarda Procedure using Absorbable suture material (PDS) and Group B underwent Desarda Procedure using Non Absorbable suture material (Prolene). Both short term and long term outcomes were recorded with a follow up of 6 months. **Results:** Majority of the cases were Direct inguinal hernia with majority belonging in the age group of 31- 60. Post operative pain was significantly higher ($P < 0.001$) in Prolene group whereas there was no significant difference in complications and were comparable. Follow up showed more number of cases with chronic pain in Prolene, however, both groups had no cases of recurrence. **Conclusions:** In this study use of PDS and Prolene showed similar outcomes. But on using PDS we are completely overcoming the use of foreign body in inguinal hernia repair. Hence, Desarda Repair for Inguinal Hernia using Absorbable Suture Material (PDS) can be considered.

INTRODUCTION

Hernia refers to the protrusion of a viscus or part of a viscus through an abnormal opening in the wall of its containing cavity. Inguinal hernia repair is one of the most frequently performed operations in general surgery, with reported recurrence rates varying considerably according to the surgical technique and duration of follow-up.^[1]

The surgical management of inguinal hernia has evolved considerably over centuries. Early procedures were associated with significant morbidity due to limited anatomical knowledge and the absence of aseptic techniques. Advances in the understanding of inguinal anatomy by anatomists such as Hesselbach, Cooper, Camper, Scarpa,

Richter, and Gimbernat, together with the introduction of antiseptic principles, improved surgical outcomes. Bassini subsequently revolutionized hernia repair by introducing a tissue-based technique, which was followed by modifications such as the McVay and Shouldice repairs.^[2,3]

The introduction of Lichtenstein's tension-free mesh repair in the 1980s represented a major advancement in inguinal hernia surgery. However, mesh-related complications, including chronic groin pain, infection, foreign-body reactions, nerve entrapment, and potential injury to the spermatic cord, remain important concerns.^[4,5] Laparoscopic repair offers an alternative approach but involves higher costs, technical complexity, and a steep learning curve.^[6]

In 1998, Mohan Desarda introduced a mesh-free, tissue-based repair that utilizes a strip of the external oblique aponeurosis to reinforce the posterior wall of the inguinal canal. The technique aims to provide dynamic reinforcement while preserving the anatomical relationships and functional integrity of the abdominal muscles. During muscle contraction, the aponeurotic strip develops increased tension, thereby strengthening the posterior wall and providing a physiological barrier against herniation.^[7]

Desarda repair offers a potential alternative to conventional mesh-based and other tissue-based techniques. Its simplicity, avoidance of prosthetic material, and proposed physiological reinforcement make it a relevant approach for evaluation. Furthermore, the use of absorbable sutures and continuous suturing may offer additional practical advantages, although their effectiveness requires clinical assessment.

The present study aims to evaluate the outcomes of inguinal hernia repair using the Desarda technique with absorbable and continuous sutures, focusing on postoperative recovery, complications, and recurrence, as applicable to the study protocol.

MATERIALS AND METHODS

The present study was a single-blind, randomized comparative study conducted to compare the short-term outcomes of Desarda repair for primary uncomplicated inguinal hernia using absorbable and non-absorbable suture materials. The study was conducted at BGS global institute of Medical sciences, Bengaluru, from June 2023 to June 2026. A total of 50 patients underwent Desarda repair, with 25 patients allocated to the absorbable suture group using polydioxanone (PDS) and 25 patients to the non-absorbable suture group using polypropylene (PROLENE). Written informed consent was obtained from all participants after explaining the study objectives, treatment procedures, and blinding process. The Visual Analogue Scale (VAS) for pain assessment was explained in detail to all patients.

Patients presenting with primary inguinal hernia were evaluated through detailed history-taking and physical examination conducted by the same examiner. Hernias were classified according to the European Hernia Society (EHS) classification. Patients' contact details and addresses were recorded for follow-up. Routine preoperative investigations included haemoglobin estimation, random blood glucose, blood urea, serum creatinine, electrocardiography, routine urine examination for sugar, albumin and microscopy, chest radiography, and ultrasonography of the abdomen. Patients with medical conditions that contraindicated surgery were treated appropriately and reassessed for surgical fitness before enrolment.

The study included men and women aged 18 years or older presenting with uncomplicated inguinal hernia

to BGS global Institute of Medical sciences. Patients with recurrent inguinal hernias, complicated hernias such as obstructed or strangulated hernias, and giant inguinal hernias were excluded from the study.

Patients were randomly allocated to the two treatment groups using a computer-generated randomization sequence prepared with SPSS version 22 software. The allocation sequence was generated using the closed-sequence method, as described in the study protocol. Patients were blinded to the type of suture material used during surgery. The assigned suture material was selected according to the randomization schedule at the time of the procedure.

All patients underwent Desarda repair under spinal anaesthesia. The procedure involved using an undetached strip of the external oblique aponeurosis to reinforce the posterior wall of the inguinal canal. The strip was sutured to the inguinal ligament inferiorly and the muscle arch superiorly, behind the spermatic cord, using either absorbable PDS or non-absorbable PROLENE sutures, according to group allocation. The total duration of surgery was recorded.

Postoperative pain was assessed using the VAS on postoperative days 1, 3, 5, and 7. The scale consisted of a 10-cm line ranging from 0, indicating no pain, to 10, indicating the worst or severe pain. Patients were encouraged to ambulate as soon as the effects of spinal anaesthesia had subsided, and the time taken to walk without discomfort was documented. Early postoperative complications, including haematoma, seroma, and wound infection, were assessed. Follow-up evaluations were conducted in the outpatient department at 1, 3, and 6 months to assess complications, including chronic groin pain and hernia recurrence.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics version 22 (IBM Corp., Armonk, NY, USA). Categorical variables were expressed as frequencies and percentages, and comparisons between groups were performed using the chi-square test. Continuous variables were summarised as means and standard deviations, where appropriate. The independent-samples t-test was used for normally distributed continuous variables, while the Mann-Whitney U test was used for non-normally distributed continuous variables. Graphical representations, including bar charts and line diagrams, were prepared using Microsoft Excel and Word. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Approval to conduct the study was obtained from the Department of Surgery and the Institutional Ethics Committee of BGS global Institute of Medical Sciences, Bengaluru. The nature, purpose, and potential benefits of the study were explained to participants in a language they understood. Written informed consent was obtained through the participant's signature or thumb impression before enrolment.

RESULTS

Table 1: Age distribution comparison between two groups

		Group			
		PDS		Prolene	
		Count	%	Count	%
Age	18 to 20 years	3	12.0%	2	8.0%
	21 to 30 years	1	4.0%	2	8.0%
	31 to 40 years	7	28.0%	7	28.0%
	41 to 50 years	2	8.0%	4	16.0%
	51 to 60 years	8	32.0%	7	28.0%
	>60 years	4	16.0%	3	12.0%
Total		25	100.0%	25	100.0%

$\chi^2 = 1.410$, df = 5, p = 0.923

In the study there was no significant difference in age distribution between two groups.

Table 2: Diagnosis distribution comparison between two groups

		Group			
		PDS		Prolene	
		Count	%	Count	%
Diagnosis	Left Direct Inguinal Hernia	11	44.0%	6	24.0%
	Left Indirect Inguinal Hernia	3	12.0%	4	16.0%
	Right Direct Inguinal Hernia	7	28.0%	10	40.0%
	Right Indirect Inguinal Hernia	4	16.0%	5	20.0%
	Total	25	100.0%	25	100.0%

Table 3: Complaints distribution comparison between two groups

		Group				P value
		PDS		Prolene		
		Count	%	Count	%	
Swelling	No Swelling	2	8.0%	1	4.0%	0.830
	Left Swelling	11	44.0%	11	44.0%	
	Right Swelling	12	48.0%	13	52.0%	
Pain	Yes	4	16.0%	8	32.0%	0.185
	No	21	84.0%	17	68.0%	

In PDS group, 44% had left side swelling and 48% had right side swelling and in Prolene group, 44% had left side swelling and 52% had right swelling. There was no significant difference in swelling

between two groups. In PDS group, 16% had Pain and in Prolene group, 32% had Pain. There was no significant difference in Pain score between two groups.

Table 4: Duration of Complaints comparison between two groups

	Group	N	Mean	SD	P value
Swelling Duration Months	PDS	23	11.630	16.0654	0.405
	Prolene	24	8.375	9.8491	
Pain duration days	PDS	4	25.000	26.1916	0.777
	Prolene	8	19.875	29.7535	

In the study there was no significant difference in mean swelling duration and pain duration between two groups.

Table 5: Duration of surgery comparison between two groups

	Group	N	Mean	SD	P value
Duration of Repair	PDS	25	49.40	4.163	0.077
	Prolene	25	51.80	5.180	
Total Duration of Surgery	PDS	25	63.60	4.213	0.029*
	Prolene	25	66.60	5.148	

Mean duration of repair in PDS group was 49.40 ± 4.163 and in Prolene group was 51.80 ± 5.180 . There was no significant difference in duration of repair between two groups.

Mean Total Duration of Surgery in PDS group was 63.60 ± 4.213 min and in Prolene group was 66.60 ± 5.148 min. There was significant difference in mean Total Duration of Surgery between two groups.

Table 6: VAS Score comparison between two groups

	Group						P value
	PDS			Prolene			
	Mean	SD	Median	Mean	SD	Median	

POD 1	5	1	5	6	1	6	<0.001*
POD 3	2	1	2	3	1	3	<0.001*
POD 5	1	0	1	1	1	1	0.006*
POD 7	0	0	0	0	0	0	1.000

In the study there was significant difference in mean VAS score between two groups at POD 1, POD 3 and POD 5. At these intervals VAS score was low in PDS Group compared to Prolene group.

Table 7: Complications comparison between two groups

		Group				P value
		PDS		Prolene		
		Count	%	Count	%	
POD 1	Nil	25	100.0%	25	100.0%	-
POD 3	Nil	24	96.0%	25	100.0%	0.312
	Wound infection	1	4.0%	0	0.0%	
POD 5	Nil	24	96.0%	21	84.0%	0.157
	Seroma	1	4.0%	4	16.0%	
POD 7	Nil	25	100.0%	25	100.0%	-

In both groups on POD1, none of them had complications. On POD 3 in PDS group, 4% had wound infection and in Prolene group 0% had infection. On POD5 in PDS group 4% had Seroma

and in Prolene group, 16% had Seroma. On POD7 in both groups none of them had complications. There was no significant difference in Complications between two groups.

Table 8: Day of Ambulation comparison between two groups

		Group			
		PDS		Prolene	
		Count	%	Count	%
Ambulation	POD 1	22	88.0%	13	52.0%
	POD 2	3	12.0%	12	48.0%

$\chi^2 = 7.714$, $df=1$, $p = 0.005^*$

In PDS group, 88% had ambulation on POD1 and 12% on POD2. In Prolene group, 52% had ambulation on POD 1 and 48% had ambulation on POD2. There was significant difference in Ambulation between two groups.

Table 9: Day of Gait Return comparison between two groups

		Group			
		PDS		Prolene	
		Count	%	Count	%
Gait Return	POD 3	19	76.0%	9	36.0%
	POD 4	6	24.0%	16	64.0%

$\chi^2 = 8.117$, $df=1$, $p = 0.004^*$

In PDS group, Gait returned on POD 3 in 76% and on POD 4 in 24% and in Prolene group, Gait returned on POD 3 in 36% and on POD 4 in 64%. There was significant difference in gait return between two groups.

Table 10: Recurrence comparison between two groups

		Group			
		PDS		Prolene	
		Count	%	Count	%
1 M	Nil	25	100.0%	25	100.0%
3 M	Nil	25	100.0%	25	100.0%
6 M	Nil	25	100.0%	25	100.0%

In the study at 1 month, 3 months and 6 months none of them had recurrence in both the groups.

Table 11: Chronic Pain comparison between two groups

Group				P value
PDS		Prolene		
Count	%	Count	%	
25	100.0%	23	92.0%	0.149
0	0.0%	2	8.0%	
24	96.0%	21	84.0%	
1	4.0%	4	16.0%	0.157

In PDS group at 3 months, 0% had chronic pain and at 6 months, 4% had Chronic pain and in Prolene group, at 3 months, 8% had chronic pain and at 6

months, 16% had chronic pain. There was no significant difference in chronic pain between two groups at 3 months and 6 months.

DISCUSSION

Inguinal hernia repair is one of the most common surgical procedures worldwide. Surgical repair of hernia is dated back to the 18th century, when Bassini described his technique. Since then, the search for an Ideal hernia repair is still underway. An Ideal Hernia repair should be tension free, tissue based, with no use of foreign body, with no long-term pain or complications and no recurrence.^[8]

Lichtenstein hernia repair is being widely used for all inguinal hernia repair with very few exceptions. However, it is far from an ideal hernia repair as it is not tissue based and has complications like chronic pain. In this search for an ideal hernia repair, Desarda procedure can be considered, satisfying the criteria for an ideal hernia repair Earlier Dr. Desarda used both non absorbable and absorbable suture material for suturing the strip of external oblique aponeurosis to arch fibres to strengthen posterior wall of inguinal canal with no difference in outcomes.^[9] But by using a non absorbable suture material the aim of overcoming the use of foreign body for hernia repair is not achieved.^[10] Hence in this study, our aim is to completely overcome the placement of foreign body in the inguinal region by using absorbable suture material.

The present study was carried out at BGS global Institute of Medical sciences comparing the short-term outcomes of Desarda Procedure using Absorbable and Non-Absorbable suture material with a follow up of 6 months. This study included 50 patients, who were divided into two groups – PDS group and Prolene group, with 25 patients in each group. In this study majority of cases for both the groups were under the age group 3rd to 5th decade. This study all the cases studied were male patients. Patient presented with Swelling as the most common presentation, with most patient presenting within 8 - 12 months. Both Direct and Indirect Inguinal Hernia were included in our study. Perioperatively there were no complications seen in both the groups, with average duration of surgery being around 60- 65 min. Though there was statistical difference in post operative pain between both groups on POD 1, 3, 5 and 7, with pain being lesser in PDS group, overall, the pain showed a downward trend.^[11,12]

Among the postoperative complications encountered in this study, Prolene group had a higher rate of Seroma and wound infection when compared to PDS with both groups having no complaints of foreign body sensation. There was no significant difference in post operative complications between two groups. After 6 months of follow up, chronic pain was more common in patients in prolene group when compared to PDS group. Both groups had no patients with recurrence.^[13,14]

CONCLUSION

Even though this study comparing the Desarda procedure using Absorbable and Non Absorbable suture material for Inguinal hernia showed similar outcomes, the use of absorbable suture material has the advantage of: Lesser postoperative pain when compared to use of non absorbable suture material, Minimal post operative complications. No foreign body sensation on follows up as there is no foreign material being left in the inguinal region. After inferring the outcomes of this study, it can be concluded that Desarda procedure using absorbable suture material for Inguinal Hernia is a promising procedure and can be considered as an ideal Hernia repair as it has the advantage of being a truly tension free, pure tissue based repair with lesser postoperative pain and complications, with added advantage of completely overcoming the placement of foreign material in inguinal region. Hence, Desarda repair for Inguinal Hernia using Absorbable suture material can be considered as an alternative to other tissue-based repair

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