

A Prospective Randomized Trial of Polypropylene Mesh Compared with Nylon/Prolene Darn in Inguinal Hernia Repair

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Abstract

Background: The outcome of the hernia repair has been studied extensively. The high recurrence rate which was seen when surgery was performed using fascia for inguinal hernia or when the suturing was done under tension resulted in the development of various other structures which can be used for the repair. As a result of it Nylon darn with minimal tension was developed later on polypropylene mesh was developed to strengthen the posterior wall of inguinal canal during hernia repair. The objective is to compare the two techniques commonly employed in the treatment of inguinal hernia repair i.e. Polypropylene mesh and Prolene darn. **Subjects and Methods:** The present Randomized control study was done in the department of surgery at Dr B R Ambedkar Medical College and K C General Hospital from January 2003 to January 2005 for a period of Two years. During this period 40 cases of inguinal hernia were studied, 20 cases were managed by polypropylene mesh repair and 20 cases were managed by Prolene darning technique. **Results:** In the present study study subjects were between 18 to 70 years of age with majority (30%) of them between 41 to 50 years of age, 20% between 51 to 60 years of age. Among the late complications neuralgia was seen in 10% of study subjects in mesh group and 15% in Prolene darn group. Scar tenderness was seen in only one subjects in Prolene Darn group. The Recurrence was seen in only one subject among Mesh Group at the end of 12 months of follow up period. **Conclusion:** Polypropylene mesh repair has no added advantage over prolene darn with respect to early postoperative pain complications or return to normal activities. Patients experienced mild-to-moderate pain irrespective of type of repair.

Keywords: Hernia, Prolene Mesh, inguinal, polypropylene mesh.

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Introduction

The hernia is defined as the protrusion of the viscus or any of its parts through any opening in the wall of its containing cavity. Among all the hernias inguinal hernia is considered to be the most common type of hernia and operation of hernia accounts for 15 % of overall operation among adults.

Inguinal hernias are among the oldest surgical challenges and have been recognized by the ancient people, Egyptians and the ancient Greeks. In Greek words, Hernios represent shoot and the word hernia is derived from it representing shooting of the viscus membrane. Hippocrates (500 BC) had mentioned it in his literature and the surgery of the hernia is a result of trial and error of surgeons from the past 22 centuries.^[1,2]

The definitive and absolute treatment of hernia is a surgical procedure which is approximately 80 in number which is described by Bassini in 1887 in his Report.^[1]

The outcome of hernia repair has been studied extensively. The high recurrence rate which was seen when surgery was performed using fascia for inguinal hernia or when the suturing was done under tension resulted in the development of various other structures that can be used for the repair. As a result, Nylon darn with minimal tension was developed later on polypropylene mesh was developed to strengthen the posterior wall of the inguinal canal during hernia repair.

In the study done by Moleney Et al,^[2] the usage of nylon darn was described which was considered to be effective and cheap for use in the repair of hernia which had a recurrence rate of 0.8%. In another study done by Lichtenstein et al the usage of polypropylene mesh showed nil recurrence rate resulted in excessive usage of the mesh.^[3]

With the advanced laproscopic approaches for hernia repair that have been developed and evaluated even the best and effective method in the open approach also needs to be

evaluated. [4-6]

This study aims to compare the two techniques, mesh repair and Prolene darning, commonly employed in the treatment of inguinal hernia in men, assessing complications, postoperative pain, return to normal activities, early recurrence and cost-effectiveness.

Objectives:

To compare the two techniques commonly employed in the treatment of inguinal hernia repair i.e. Polypropylene mesh and Prolene darning.

Subjects and Methods

The present Randomized control study was done in the department of surgery at Dr. B R Ambedkar Medical College and KC General Hospital from January 2003 to January 2005 for a period of two years.

During this period 40 cases of inguinal hernia were studied, 20 cases were managed by polypropylene mesh repair and 20 cases were managed by Prolene darning technique.

Inclusion Criteria

- All men with primary inguinal hernia.
- Age 18-90 years.
- Willing to participate.

Exclusion Criteria

- Recurrent hernia
- Inguino-scrotal hernia

All cases were evaluated by documenting history taking and physical examination and laboratory investigations. During history taking particular importance was given to the age, occupation and other contributory risk factors and comorbid medical illness.

During the physical examination, location, type of hernia, tone of abdominal muscles was given importance. A thorough examination was done to detect straining factors like BPH, constipation, stricture urethra. Patients with respiratory tract infection, COPD, asthma, diabetes and hypertension were treated and stabilized. All patients were given IV antibiotics preoperatively and postoperatively. The treatment of 20 cases was done by Mesh repair and another 20 cases by Prolene darning. The vacuum drain was used and removed on the second or third day. Patients were allowed ambulation on the first postoperative day. Patients were followed up at 1 week, 6 weeks and 1 year.

Results

A total of 40 study subjects were enrolled in the present study. out of the 40 study subjects 20 were divided into group A and 20 study subjects into Group B.

Table 1: Distribution of study subjects based on the age group

		Frequency	Percentage
Age	18-30	6	15
	31-40	10	25
	41-50	12	30
	51-60	8	20
	61-70	4	10

In the present study subjects were between 18 to 70 years of age with the majority (30%) of them between 41 to 50 years of age, 20% between 51 to 60 years of age.

Table 2: Distribution of study subjects based on Clinical Features.

		Frequency	Percentage
Symptoms	Groin Swelling	23	57.5
	Swelling with Pain	17	42.5
Type	Right Indirect	14	35
	Right Direct	9	22.5
	Left Indirect	5	12.5
	Left Direct	4	10
	Bilateral Indirect	2	15
	Bilateral Direct	6	5

In the present study nearly 57.5% of the study subjects had groin Swelling and 42.5% presented with Swelling along with pain. Indirect type (62.5%) of hernia was found to be the most common type of hernia in our study. The majority (35%) of the study subjects presented with Indirect hernia on the right side, 22.5% of them had Direct hernia on the Right side, 12.5% had Indirect hernia on the left side, 10 % had a direct hernia on the left side, 15% had Indirect hernia on both sides and 5% had a direct hernia on both sides.

The postoperative pain score at 24 hours post-operative was compared between both the study groups. Among the study subj mild in Mesh Repair group 20% of them had mild, 45% of them had moderate, 30% had severe the and 5% had

Table 3: Comparison of Post-Operative Pain scores among study subjects in both the groups

		Mesh Repair (n=20)		Prolene Darning (n=20)	
		Frequency	Percentage	Frequency	Percentage
Post-Operative	None	0	0	0	0
	Mild	4	20	5	25
	Moderate	9	45	8	40
	Severe	6	30	6	30
	unbearable	1	5	1	5
Post-Operative	None	1	5	2	10
	Mild	12	60	10	50
	Moderate	6	30	4	20
	Severe	1	5	3	15
	unbearable	0	0	1	5

unbearable pain. Sthamarly, in the Prolene Darning group 25% of them had mild, 40 % had moderate, 30% had severe and 5 % had unbearable pain.

The postoperative pain score at 72 hours post-operative was compared between both the study groups. Among the study subjects in the Mesh Repair group 5% had no pain, 60% of them had mild, 30 % of them had moderate, 5% had severe pain. Similarly, in the Prolene Darning group 10% had no pain, 50% of then had mild, 20 % had moderate, 15% had severe and 5 % had unbearable pain.

In the present study Urinary Retention (20% in Mesh Group and 25% in Prolene Darn) was found to be the most common complication within 7 days in both the groups followed by Hematoma (15%) in both the group. Neuralgia, Infection, Serosa and wound Oozing were other complications seen in both the groups.

Among the late complications, neuralgia was seen in 10% of study subjects in the mesh group and 15% in the Prolene darn group. Scar tenderness was seen in only one subject in the Prolene Darn group.

The Recurrence was seen in only one subject among Mesh Group at the end of 12 months follow up period.

Discussion

The incidence of age at presentation of inguinal hernia was maximum between 30 – 60 years of life in a study by Albert M E and Bourke et al.^[3,7] The present study was comparable to these studies. The most common presentation of hernia is swelling. In our study of 40 patients 23 (57.5%) patients presented with swelling and 17 (42.5%) patients presented with swelling and pain and it was comparable to other study findings.

In the present study, most of the patients experienced mild-to-moderate pain (p=0.41) for 24 hours/p=0.62/for 72 hours. Results are comparable with Koukourou et al study.^[8]

There was no statistically significant difference between the two groups in the rate of early complications (p=0.63) or late complications (p=0.49). Results can be compared with the Lyon study.

During 1 year of follow-up, only one recurrence was found in non-mesh repair and no recurrence in the mesh group. (p=0.009). Results are comparable with Vrijland studies.^[9]

Return to normal activity does not completely depend on the type of repair done rather it depends on the socio-economic status, educational level and type of work they do. In our study patients who do heavy and strenuous work took more time when compared to patients who do light work.

The mean time to return to normal activity after mesh repair was 35 days and that following prolene darning was 38 days (p=0.99). Darning was comparatively less expensive than mesh repair. The average expenses at our center for prolene darning were Rs. 3000 and for mesh repair was Rs. 5000.

Conclusion

Polypropylene mesh repair has no added advantage over prolene darn with respect to early postoperative pain complications or returns to normal activities. Patients experienced mild-to-moderate pain irrespective of the type of repair. There is no significant difference between the two groups in the rate of early or late complications. Long-term follow up is required for a full determination of recurrence rates. Darning is comparatively less expensive than mesh repair. Patients who do strenuous and heavy work will take more time to return to normal activity when compared to those who do light work. Darn-

Table 4: Distribution of complication after hernia Repair

		Mesh Group		Prolene Darn-ing	
		Frequency	%	Frequency	%
Early < 7 days	Hematoma	3	15	3	15
	Infection	1	5	1	5
	Neuralgia	2	10	3	15
	Serosa	1	5	1	5
	Wound oozing	1	5	2	10
	Urinary Retention	4	20	5	25
Late > 7 days	Neuralgia	2	10	3	15
	Scar tenderness	0	0	1	5
Recurrence Rate	@ 1 month	0	0	0	0
	@ 6 Months	0	0	0	0
	@ 12 Months	1	5	0	0

ing is also an effective method in repairing an inguinal hernia and can be used in patients with constrained financial set up with equivalent results.

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