



COMPARISON BETWEEN LOW DENSITY POLYETHYLENE (LDPE) MOSQUITO NET MESH AND STANDARD POLYPROPYLENE MESH IN INGUINAL HERNIA

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ABSTRACT

Background: Inguinal hernia is one of the commonest medical problems but in developing countries, cost of the prosthesis is a significant factor in health care delivery.

Methods: A clinical trial of 60 patients of inguinal hernia operated by Lichtenstein technique from November 2014 to October 2016 was undertaken to evaluate complications and recurrence rate using MNM and compared with conventional Polypropylene mesh.

Results: The rate of seroma formation was 6.66% and 3.33%, cumulative VAS score for pain was 3.8 and 4, rate of foreign body sensation at 1 and 3 months was 26.66% and 10% in study group and 46.66% and 33.33% in control group and recurrence was nil in both groups. The cost benefit was upto 95% of the mesh cost.

Conclusions: Steam sterilized LDPE MNM is a safe and very cost effective alternative to commercial mesh.

KEYWORDS : Inguinal hernia, Hernioplasty, Mosquito net mesh

Introduction
Inguinal hernioplasty is one of the most frequently performed operations worldwide .The greatest contribution to tissue based repair of hernia came from Italian surgeon Edoardo Bassini ^[1-4], who used interrupted silk sutures to strengthen the posterior wall .

Lotheissen^[5], Mcway, Halsted^[6], Shouldice^[7], and others described modification of Bassini's repair in an attempt to further reduce the recurrence rate and to avoid complications. However in these methods there is undue tension on the suture line and utilization of this already defective tissue in the repair of hernias is counter-productive.

So Tension Free Mesh Hernioplasty using prosthetic mesh popularized by Lichtenstein is the method of choice ^[8]. 'Polypropylene Mesh' today is the best material available^[9]. But the 'Polypropylene Mesh' available is costly. This cost is very much prohibitive causing poor patients to either go untreated or undergo tension repair, with considerable risks of complications. So in recent years, innovative surgeons have tried replacing the commercial surgical mesh with a cheap, sterilized mosquito net.^[10-19] This is very cost-effective, making the solution humanitarian as well as economical.

The objective of the present study is to evaluate the safety, complications and recurrence rate of Lichtenstein tension free repair using LDPE MNM and compare the cost benefit with conventional standard mesh repair.

METHODS
A prospective study was done on all patients with diagnosis of inguinal hernia admitted in Dr. Susheela Tewari Government Hospital , Rampur Road, Haldwani, Nainital, Uttarakhand from November 2014 to October 2016 for planned inguinal mesh hernioplasty. A total of 60 patients were included in the study, 30 patients were allocated to each arm of the surgery.

Inclusion criteria:

- Patients (both male & female) 20 years of age or older with unilateral/bilateral primary inguinal hernia.

Exclusion criteria:

- Age <20 years.
- Recurrent hernias, complicated hernias (Obstructed,

- strangulated)
- Patients not consenting for the procedure.

Pre-operative Methodology:
A detailed history and clinical examination was elicited and patients were classified according to Gilberts hernia grading. Informed written consent was taken from all patients specifying differences between MNM and Polypropylene mesh. The surgical procedure was done under spinal anesthesia.

Antibiotic protocol
One dose of Inj. Cefotaxime 1 gm. iv as per-operative prophylaxis one or more dose postoperative, 8 hourly

Analgesia protocol
Post operative inj. Diclofenac 75mg i.m. was given on demand when pain becomes severe when patient had visual analogue score of five or more but the gap between the two doses was kept at least 8 hours .

Follow up :
Patients were be followed up at **1 week, 1 month, 3 months** intervals for evaluation of seroma formation, wound infection, pain, foreign body sensation and recurrence.

Data sources and outcome variables:-
A standard data collection table were used in order to record patient demographics (age and sex), operative characteristics, and postoperative complications.

RESULTS.		
Distribution of AGE for both study and control groups.		
	Study Group (n=30)	Control Group
Minimum (years)	21	20
Maximum (years)	72	70
Range	51	50
Mean (years)	44.6	47.6
Standard Deviation	16.272	16.13

The two-tailed P value equals 0.438 which shows difference in age between study and control group was not significant

CLASSIFICATION OF HERNIA
Study and controls were classified according to GILBERT of grading

of hernia.

Patients in both groups were unevenly spread in various grades. The patients were highest in Gilbert category 3. They accounted for almost 50% of all patients.

The 24 hour POST OPERATIVE PAIN SCORE (Cumulative VAS score)

Cumulative VAS score	Study (n=30)	Control (n=30)
2	3	2
3	9	8
4	11	9
5	5	10
6	2	1
Minimum	2	2
Maximum	6	6
Range	4	4
Mean	3.8	4
Standard Deviation	1.063	1.017

The mean VAS for study group was 3.8 and control was 4 with p value of (0.460) which indicates cumulative VAS score between study and control group was not significant. The minimum cumulative VAS score and the maximum cumulative VAS score in both the groups were 2 and 6.

Rate of WOUND COMPLICATIONS in the two groups.

		Wound Complication		
Group		Seroma	Mesh Rejection	TOTAL
Study	No.	2	0	30
	%	6.66%	0%	
Control	No.	1	0	30
	%	3.33%	0%	
Total	No	3	0	60
	%	5%	0%	

In the study group, 2 patients had seroma formation while in the control group, 1 patients had seroma formation while there was no mesh rejection in either of the two groups.

FOREIGN BODY SENSATION

		FOREIGN BODY SENSATION		
Group		ONE MONTH	THREE MONTHS	TOTAL PATIENT
Study	No.	8	3	30
	%	26.66%	10%	
Control	No.	14	10	30
	%	46.66%	33.33%	60
Total	No	22	13	
	%	30%	18.33%	

Foreign body sensation at 1 and 3 months was 26.66% and 10% in study group and 46.66% and 33.33% in control group at one month and at three months post operatively.

RECURRENCE:

There were no recurrence in both study and control group with a follow up period of 3 months but longer follow up is required for actual assessment of recurrence.

COST EFFECTIVENESS

The cost of Mosquito Net Mesh is Rs 10/- whereas the cost of commercially available Polypropylene Mesh varies from Rs 800/- to Rs 1400/- of size 6"X3" (inches).

DISCUSSION

In the present study comparative evaluation of LDPE Mosquito Net mesh Hernioplasty with Polypropylene Mesh Hernioplasty was made in terms of cost effectiveness, post operative pain, wound complications and short term recurrence.

In evaluation of post operative pain the mean VAS for study group was 3.8 and control was 4 with p value of (0.460) which indicates cumulative VAS score between study and control group was not significant. The minimum cumulative VAS score and the maximum cumulative VAS score in both the groups were 2 and 6.

In the study group, 2 patients had seroma formation while in the control group, 1 patients had seroma formation while there was no mesh rejection in either of the two groups

However there was considerably higher incidence of foreign body sensation in the control group (polypropylene mesh) both at one month and at three months post operatively as compared to the study group (LDPE mosquito net mesh). In the study group, 8 (26.66%) patients had foreign body sensation at one month while only 3 (10%) patients complained of foreign body sensation at three months. On the contrary in the control group, 14 (46.66%) patients complained of foreign body sensation at one month while 10 (33.33%) patients complained of the same at three months.

No case of short term recurrence was reported in either group during the period of follow up, but a longer duration of follow up is required to document the same.

The only significant difference was in the total cost incurred by the patients. The cost of LDPE Mosquito Net Mesh is Rs. 10 whereas the cost of commercially available Polypropylene meshes varies from Rs. 800/- to Rs. 1400/- of 6"X3" (inches) size. So the cost benefit was upto 90-95% of the mesh cost

However mesh handling was a problem faced during the operative procedure with the LDPE mosquito net mesh. Polypropylene on the other hand was more friendly to use.

CONCLUSION

Finally it can be summarized from that Low Cost LDPE Mosquito Net Mesh has properties similar to synthetic Polypropylene mesh available in the market and can be safely used for mesh hernioplasty. Thus it can be a promising prosthesis option in patients of inguinal hernia undergoing hernioplasty in resource limited settings in developing countries.

Ethical approval: The study was approved by the Institutional Ethics Committee

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