

A Comparative Prospective Study of 50 Cases of Hernioplasty Done by Polyester Mesh Versus Polypropylene Mesh

Anshuman A. Tripathi¹, Vikram B. Gohil², Samir M. Shah³

¹Junior Resident, ²Associate Professor, ³Professor & Head, Dept. of General Surgery, Sir T. Hospital & Govt. Medical College, Bhavnagar, Gujarat 364001, India.

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Abstract

Background: Open hernioplasty is one of the most common surgical treatments [1]. The aim of the mesh used in hernia repair should be to reinforce the abdominal wall without reducing the mobility by excessive scarring [2]. Worldwide over a million meshes are implanted every year [3]. Complications such as foreign body sensation and reduced life quality are described in the follow-up and depends on the size and structure of the incorporated material [12]. Polyester mesh is hydrophilic as opposed to hydrophobic prosthesis such as polypropylene mesh or polytetrafluoroethylene mesh and thus encourages early biologic fixation and collagen ingrowth into surrounding tissue [5]. **Objective:** Evaluate the effect of type of mesh (polypropylene mesh versus polyester mesh) used during hernia repair on mean-time outcomes mainly focusing on post-operative wound infection, development of seromas, post-operative return to work, post-operative foreign body awareness and recurrence. **Methods:** A total of 50 cases of anterior abdominal wall hernias are selected and divided into Group A that consists of 25 cases of hernioplasty done using polypropylene mesh and Group B that consists of 25 cases of hernioplasty done using polyester mesh. They are studied and followed up using standard questionnaire at Sir T. Hospital and Government Medical College, Bhavnagar, Gujarat (364001). **Results:** Among 50 cases studied, percentage of male patients was higher than that of female patients. The use of synthetic polyester mesh in the hernioplasty results in no or decreased

incidences of wound infection, seroma formation and foreign body sensation. It can also be concluded that Polyester mesh is cost effective in terms of hospital stay duration and early resumption of work. **Conclusion:** In this study use of polyester mesh for hernioplasty have more satisfactory outcomes as compared to polypropylene mesh when various parameters are compared.

Keywords: Hernioplasty; mesh; polypropylene; polyester.

Introduction

The mechanism behind such hernia formation is still under debate in the direction of anatomical defect or connective tissue disorder [4]. In different studies nearly five percent of all patients with implanted meshes because of a primary inguinal hernia suffer from chronic pain [6]. The extent of the foreign-body reaction with its provoked scar tissue formation seems to depend on the amount and structure of the incorporated material [13]. Permanent relief of pain or discomfort and low incidence of peri- and postoperative complications and recurrence rates are the goals of successful hernia repair [7]. Now days we have three big groups of material concerning non-resorbable meshes: polypropylene, polyester and polytetrafluoroethylene [8]. It has been observed that choice of the mesh-prosthesis in inguinal hernia repair is far more important than technique as a determinant of outcome [11]. Still in literature there is no consensus which material has the best biocompatibility in humans [9]. It is clear that the evolution of meshes is not yet complete and the ideal mesh has yet to be found [10].

Corresponding Author: Vikram B. Gohil, Associate Professor, Dept. of General Surgery, Sir T. Hospital & Govt. Medical College, Bhavnagar, Gujarat-364001.

E-mail: tripathi.anshuman91@gmail.com

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Aims and Objectives

1. Evaluate the effect of type of mesh (polypropylene mesh versus polyester mesh) used during hernia repair on mean-time outcomes mainly focusing on development of seromas, recurrence, post-operative wound infection, post-operative return to work, foreign body awareness.
2. To accentuate the scope of new material in hernia repair.
3. To reduce overall complications in hernia repair.

Material and Methodology

In this study total of 50 cases of anterior abdominal wall hernias are selected. Among them Group A consists of 25 cases of hernioplasty done using polypropylene mesh and Group B consists of 25 cases of hernioplasty done using polyester mesh. They are studied and followed up between September 2016 to May 2017 at Sir T. Hospital and

Government Medical College, Bhavnagar, Gujarat (364001). Patients are selected on the basis of various criteria.

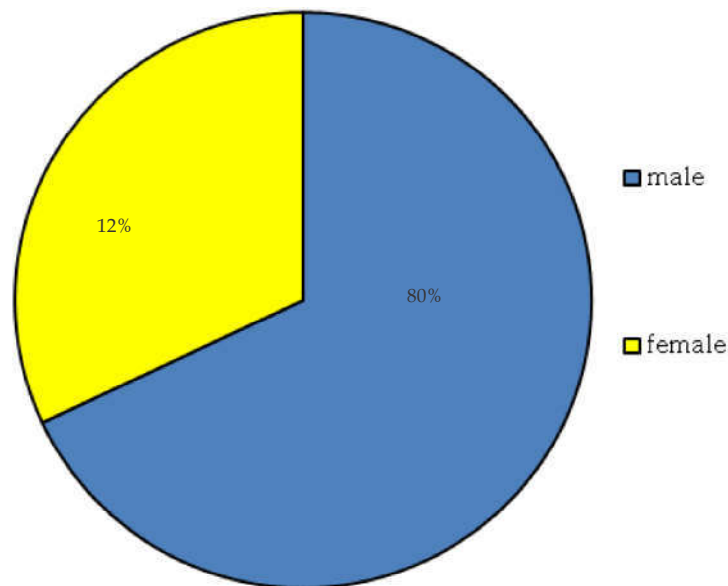
Once patient is selected, written and informed consent is obtained from him/her and their relatives. They are then explained about the study, procedure, follow up schedules and complications, if any. Detailed clinical history taking and examination was done. Routine and specific investigations were done. All the 50 cases of hernia were taken under open hernioplasty and given regional anaesthesia. In 25 cases, hernioplasty was performed with use of polyester hydrophilic mesh and rest 25 cases of hernioplasty were done using polypropylene hydrophobic mesh. Standardized questionnaires were used to document different parameters. Follow up was taken on Post-operative Day 15th, 30th and 90th. Incidence of seroma/discharge/collections was assessed using ultrasonography imaging technique (USG). Data obtained was entered on printed case record forms/sheets.

Observations & Results

Table 1: Sex Distribution

Sr. No.	Gender	No. of patients in our study	No. of people in Nasiruddin S, S.S., J. DH 2017 et al. [15] study
1.	Male	34 (68%)	48 (80%)
2.	Female	16 (32%)	12 (20%)

In both the studies, the number of male patients is more as compared to females.

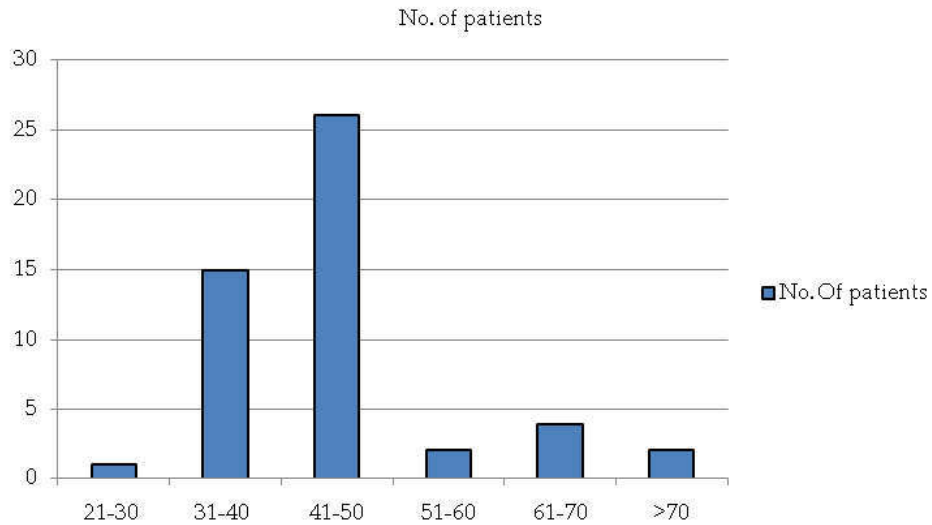


Graph 1: Sex Distribution

Table 2: Age Distribution

Sr. No.	Age group (in years)	No. of patients in our study	No. of patients in Nasiruddin S, S.S., J. DH 2017 et al. [15] study
1.	21-30	01 (2%)	08 (13.3%)
2.	31-40	15 (30%)	15 (25%)
3.	41-50	26 (52%)	24 (40%)
4.	51-60	2 (4%)	05 (8.3%)
5.	61-70	4 (8%)	07 (11.6%)
6.	>70	2 (4%)	1 (1.6%)

In both the studies, maximum numbers of patients are from age group of 41-50 years

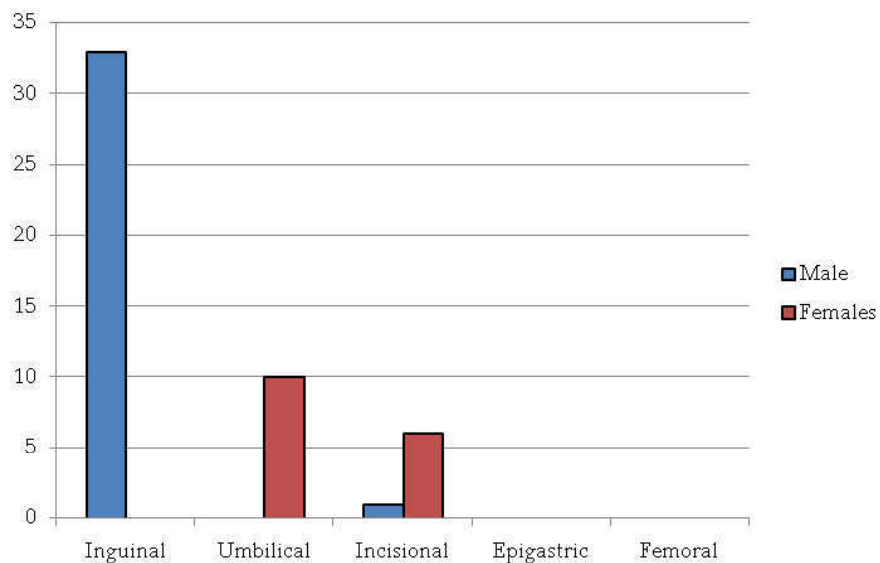


Graph 2: Age Distribution

Table 3: Types of Hernia and its Gender Distribution

Sr. No.	Types of Hernias	Male	Females
1.	Inguinal	33 (97%)	00
2.	Umbilical	00	10 (62.5%)
3.	Incisional	01 (3%)	06 (37.5%)
4.	Epigastric	00	00
5.	Femoral	00	00

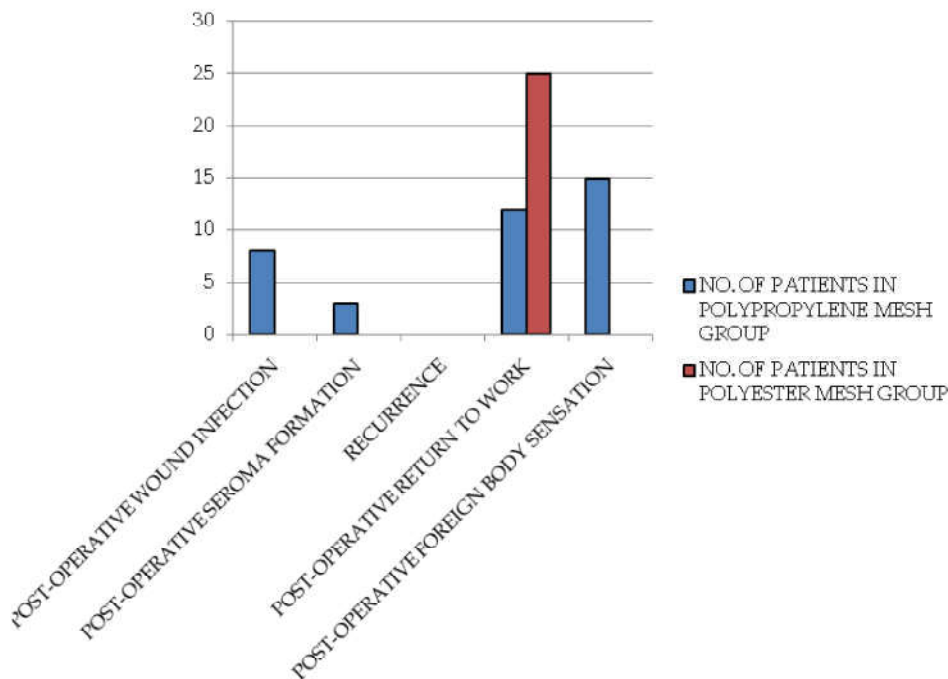
Inguinal hernias are more common in males and umbilical and incisional hernias in females.



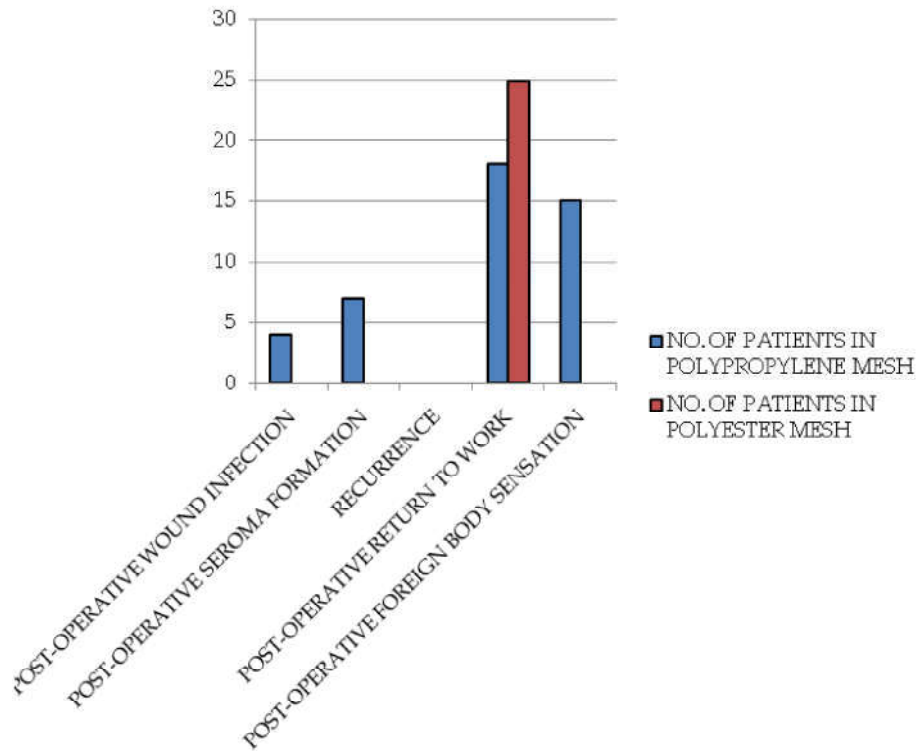
Graph 3: Types of Hernia and its Gender Distribution

Table 4: Comparison of Post-Operative Parameters Between Polypropylene Mesh and Polyester Mesh on Day 30

Sr. No.	Parameters	No. of Patients in Polypropylene Mesh (Group A)	No. of Patients in Polyester Mesh (Group B)	P Value
1.	Post-Operative Wound Infection	08 (32%)	00	0.0232
2.	Post-Operative Seroma Formation	03 (12%)	00	0.0009
3.	Recurrence	00	00	1.0000
4.	Post-Operative Return to Work	12 (48%)	25 (100%)	<0.0001
5.	Post-Operative Foreign Body Sensation	15 (60%)	00	0.0065

**Graph 4:** Comparison of Post-Operative Parameters Between Polypropylene Mesh and Polyester Mesh on Day 30**Table 5:** Comparison of Post-Operative Parameters Between Polypropylene Mesh and Polyester Mesh on Day 90

Sr. No.	Parameters	No. of Patients in Polypropylene Mesh (Group A)	No. of Patients in Polyester Mesh (Group B)	P Value
1.	Post-Operative Wound Infection	04(16%)	00	0.0186
2.	Post-Operative Seroma Formation	07(28%)	00	0.0018
3.	Recurrence	00	00	1.0000
4.	Post-Operative Return to Work	18(72%)	25(100%)	0.0096
5.	Post-Operative Foreign Body Sensation	15(60%)	00	0.0065



Graph 5: Comparison of Post-Operative Parameters Between Polypropylene Mesh and Polyester Mesh on Day 90

There was no complain in patients of any of the group i.e. polyester mesh group and polypropylene mesh group.

Discussion

In our study maximum patients are of age group of 41-50 years (26 people-52%) which is approximately similar to Nasiruddin S, S.S., J. DH 2017 et al. [15] study in which maximum patients are of age group of 41-50 years (24 people-40%). Similarly, male patients were 34 (68%) and female patients were 16 (32%) which is almost similar to the gender distribution of patients that were studied in Nasiruddin S, Suresh S, Jayanth DH 2017 et al. [15] study i.e. male patients were 48 (80%) and female patients were 12 (20%).

In our study maximum male patients have inguinal hernia, i.e. 33 patients (97%) and 1(3%) patient of incisional hernia. Similarly, maximum female patients have umbilical hernia and incisional hernia i.e. 10 patients (62.5%) and 6(37.5%) patients respectively.

In our study, it is found that there were no incidence of post operative wound infection, seroma formation or foreign body sensation in patients treated with polyester mesh. Also, maximum

patients were satisfied after operation and all of them resumed their work/occupation sooner as compared to those treated with polypropylene mesh. Similar results were obtained in Nasiruddin S, S.S., J. DH 2017 et al.[15] and Mike ralf Langenbach, stefan sauerland [14] study.

Study of recurrence of hernia in any mesh group requires long term follow up i.e. five to ten years. However in our study period time no recurrence was found in either of the groups (polyester and polypropylene mesh).

It was found that none of the patients treated with polyester mesh had incidence of post-operative wound infection or seroma formation and foreign body sensation when compared to those treated with polypropylene mesh. Similar results were obtained in Nasiruddin S, S.S., J. DH 2017 et al. [15] and Mike ralf Langenbach, stefan sauerland [14] study

So, considering all the parameters of our study it can be said that polyester mesh is better than polypropylene mesh.

Conclusion

Our present study concludes that in this new era of advanced surgical technique and new prosthesis

material for hernia repair, use of synthetic hydrophilic polyester mesh in the hernioplasty results in fewer incidences of wound infection, seroma formation and foreign body sensation. It can also be concluded that Polyester mesh is cost effective in terms of hospital stay duration and early resumption of work. Hydrophilic polyester mesh promotes biological tissue fixation with collagen ingrowth within mesh with minimal tissue reaction.

So, overall in hernia repair our study shows that Polyester mesh is superior to Polypropylene mesh.

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