

A COMPARATIVE STUDY OF PROLENE VS VYPRO MESH REPAIR FOR INGUINAL HERNIAS IN ADULTS, IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Hernias are among the oldest surgical challenges and are currently the most commonly performed general surgical operations. The surgical mesh provides tension-free repair and it firmly reinforces the weakened area and facilitates the incorporation of fibro collagenous tissue. This study is conducted to gauge the superiority of Vypro mesh vs Prolene mesh for the repair of uncomplicated inguinal hernias in adults. The aim is to study the outcome of inguinal hernia repair with Prolene vs Vypro mesh repair in terms of Post operative pain, Postoperative complications, Duration of hospital stay, and Recurrence of hernia. **Materials and Methods:** This was a randomised controlled trial conducted at Osmania General Hospital, Hyderabad. Sample size is 70 cases of uncomplicated inguinal hernia from November 2019 to October 2021. **Result:** It was found that both meshes were similar in certain aspects. However, Vypro mesh was found to be superior in terms of operating time, post operative pain, seroma formation, foreign body sensation and duration of hospital stay. There was no significant difference in recurrence rates of hernia between two groups after 6 months of follow up of patients. **Conclusion:** Vypro mesh was found to be superior in terms of post operative pain, seroma formation, foreign body sensation and duration of hospital stay and foreign body sensation, but had no significant difference in recurrence rates of hernia between two groups after 6 months of follow up of patients.

INTRODUCTION

Inguinal hernias are one of the most common problems faced by the Surgeon. 75% of all abdominal hernias are found in the groin.^[1] Of all groin hernias, 95% are inguinal hernias with the remainder being femoral hernias. Inguinal hernias are 9 times more common in men than in women but still inguinal hernia is the most common hernia in women. The overall lifetime risk of developing a groin hernia is approximately 27% in males and less than 3% among females.^[2]

Today, the tension-free mesh repair popularized by Lichtenstein and Shulman in 1986 is the most frequently executed method of inguinal hernioplasty.^[3] Technically easy to learn, requiring low initial expenditure, and suitable for light anaesthesia forms, this technique has expanded the feasibility of hernia correction.

Meshplasty is widely practiced in the repair of hernias. The surgical mesh provides tension-free repair and it firmly reinforces the weakened area and facilitates the incorporation of fibro collagenous tissue. Meshplasty has a lower recurrence rate of 2%,

when compared to other procedures of hernia repair.^[4]

A surgical mesh will undergo one of three different responses from the body: integration, encapsulation or degradation. An ideal mesh should have an optimum integration with the abdominal wall and negligible adhesion on the visceral side. To improve biocompatibility of the mesh it is highly important to have a minimal inflammatory response to better integrate it into the body.^[5]

Nowadays, there are more than 65 types of commercially available meshes. These are manufactured from animal tissues or synthetic materials which may be absorbable, non-absorbable, or a combination of both. In spite of minimal rates of recurrence, inguinal hernioplasty with surgical meshes still causes adverse effects such as adhesion, infection, and bowel obstruction. Chemical and structural properties of the mesh will be responsible for most of these complications or adverse effects.

The purpose of this study is to attempt to establish the influence of this new technique on early clinical outcomes of inguinal hernia repair, and limited study of long-term outcomes.

MATERIALS AND METHODS

Study Design: Single centred, randomized controlled trial.

Sample Size: 70

Inclusion Criteria

- Age: 18 years and above.
- Uncomplicated indirect inguinal hernia
- Uncomplicated direct inguinal hernia

Exclusion Criteria

- Age < 18 years.
- Irreducible inguinal hernia.
- Obstructed inguinal hernia.
- Strangulated inguinal hernia

Duration of Study: 2 years

Source of Study: Patients operated for inguinal hernia, during the course of the study, in Osmania General Hospital.

Outcomes

- Duration of surgery
- Post operative pain on POD- 1,3,14,30,90, 180 days.
- Surgical site infection
- Seroma
- Foreign body sensation
- Duration of Hospital stay
- Recurrence of hernia

RESULTS

In this study, all patients included are male patients, in both prolene and vypro mesh groups, Age between 20 to 70 years. Mean age of the group with Prolene mesh was 42 years. Mean age of the group with Vypro mesh was 38 years. In this study, hernia was more common on the Right side in both groups accounting to 62.9% and 54.3% respectively. Left sided hernia comprised about 37.1% and 45.7% in Prolene and Vypro groups. The difference was statistically not significant with a P value of 0.466. In

this study the Prolene group had 31.4% of cases with Direct Hernia and 68.6% of cases with indirect hernia. Vypro group had 22.9% of cases with Direct hernia and 77.1% of cases with Indirect hernia. In the study, 57.1% and 45.7% patients are chronic smokers among Prolene and Vypro groups respectively.

The mean duration of surgery in the Vypro group was 45.66+2.578 while in the Prolene group was 41.69+1.676. There was a statistically significant difference of 4 minutes with a P value of <0.001.

In our study on Post operative Day ,14.3% vs 2.9% had mild pain, 54.3% vs 62.9% had moderate pain, 31.4% vs 34.3 % had severe levels of pain in Prolene and Vypro groups respectively.

In our study on Post Operative Day 3, 48.6% vs 17.1% had no pain, 48.6% vs 51.4% had mild pain, 2.9% vs 28.6% had moderate pain, 0% vs 2.9 % had severe levels of pain in Prolene and Vypro groups respectively.

In our study on Postoperative Day 14, 71.4% vs 68.6% had no pain, 20.0% vs 28.6% had mild pain, 5.7% vs 2.9% had moderate pain, 2.9% vs 0% had severe levels of pain in Prolene and Vypro groups respectively.

In our study on Post Operative Day 30, 85.7% vs 91.4% had no pain, 8.6% vs 5.7% had mild pain, 2.9% vs 2.9% had moderate pain, 2.9% vs 0% had severe levels of pain in Prolene and Vypro groups respectively.

In our study on Post Operative Day 90, 85.7% vs 97.1% had no pain, 11.4% vs 2.9% had mild pain, 0% vs 0% had moderate pain, 2.9% vs 0% had severe levels of pain in Prolene and Vypro groups respectively.

In our study on Post Operative Day 6 Months, 1.4% vs 97.1% had no pain, 2.9% vs 2.9% had mild pain, 2.9% vs 0% had moderate pain, 2.9% vs 0% had severe levels of pain in Prolene and Vypro groups respectively.

1(2.9%) patients had surgical site infection in both Prolene and Vypro groups respectively. Here, the P value is insignificant P>0.005.

Table 1: Distribution of patients with Surgical Site Infections

SSI	Prolene group		Vypro group	
	No. of pts.	Percentages	No. of pts.	Percentages
Absent	34	97.1	34	97.1
Present	1	2.9	1	2.9
Total	35	100	35	100

In present study, 3(8.6%) patients and 1(2.9%) had seroma formation in Prolene and Vypro groups respectively. Here P value is insignificant P>0.05.

Table 2: Distribution of patients with Seroma formation

Seroma	Prolene group		Vypro group	
	No. of pts.	Percentages	No. of pts.	Percentages
Absent	32	91.4	34	97.1
Present	3	8.6	1	2.9
Total	35	100	35	100

In our study, 7(20%) and 2(5.7%) patients had Foreign Body sensation in Prolene and Vypro groups respectively. A significant association was noted with P value <0.01.

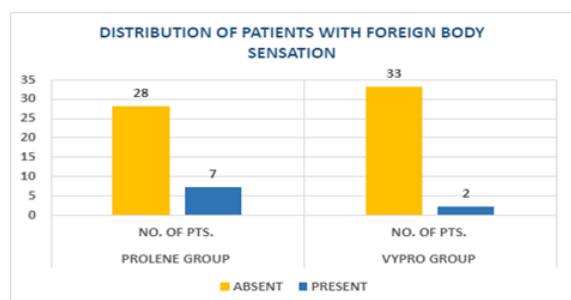
Table 3: Distribution of patients with number of days of hospital stay post operatively

Post op stay (days)	Prolene group		Vypro group	
	No. Of pts.	Percentages	No. Of pts.	Percentages
2	2	5.7	5	14.3
3	5	14.3	15	42.9
4	17	48.6	14	40
5	9	25.7	1	2.9
>05	2	5.7	0	0
Total	35	100	35	100

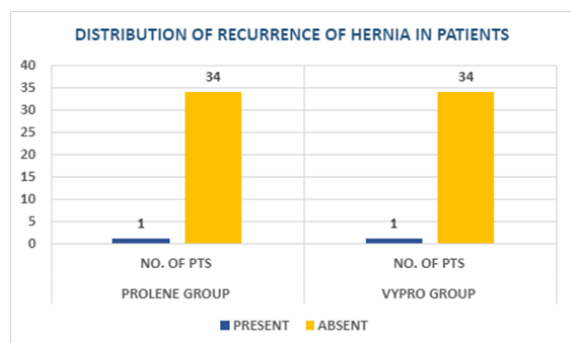
After 6 months of Follow-up of patients in our study, there was 1(2.9%) recurrence in both the groups. No significant P value was noted.

Table 4: Complications seen in post operative period

Complications	Prolene group	Vypro group
Surgical site infection	2.9%	2.9%
Seroma	8.6%	2.9%
Foreign body sensation	20%	5.7%
Post op stay in hospital	4.03 days	3.31 days
Recurrence	2.9%	2.9%

**Figure 1: Distribution of patients with foreign body sensation**

Mean duration of post operative stay in Prolene Group was 4.03+-0.822 and Vypro group was 3.31+_0.758 days with significant P value <0.001.

**Figure 2: Distribution of Recurrence of Hernia in Patients**

DISCUSSION

With the increasing incidence of Inguinal hernias across the globe and with the plethora of surgical options being available, reinforcement of inguinal region with alloplastic mesh material is increasingly preferred. With the proven benefits of using prosthesis documented in many studies, a new mesh variant Vypro mesh (PP-PG) was developed and is being used world-wide.^[6]

In this study, a total of 70 patients presenting with Uncomplicated Inguinal hernia were divided into groups of 35 each (Prolene and Vypro group) and operated with Lichtenstein Hernioplasty using Prolene and vypro mesh. The outcomes of this study were analyzed and interpreted.

Hernias of both direct/indirect types involving the left/right side were included in this study with no statistical significance between the two groups.

Duration of surgery was shorter in the Prolene group with a difference of 4 min. As far as complications are concerned,

Pain patterns were comparable in both the groups. Early postoperative pain was less in Vypro group, it aided in early mobilization and early discharge from the hospital. Pain patterns were insignificant on POD-3,14,30,90 and after 6 months. Contrary to the above results, studies conducted by Schmidtbauer et al,^[7] vypro mesh might be beneficial concerning nerve entrapment and chronic pain by creating less fibrosis and better abdominal wall compliance. O'dwyer et al in his research demonstrated better quality of life in patients with Vypro mesh used in repair.^[8]

In the present study, seroma rate was higher in prolene group than vypro group (8.6% vs 2.9%) respectively. This was concordant with the study conducted by Bringham et al which showed a 9.7% of seroma formation in prolene group much greater than inguinal repairs conducted using Vypro mesh.^[9] Surgical site infection was 2.9% in both the groups. Foreign body sensation was 20% and 5.7% in Prolene and Vypro groups respectively. Similar disadvantages of Prolene mesh were noted in the study conducted by Klinge et al accounting to 30% in his study.^[10]

In a randomized controlled trial evaluating lightweight versus heavyweight polypropylene mesh for ventral hernia repair, the recurrence rate is two times more in lightweight group in comparison to the heavyweight group (17% for lightweight mesh versus

7% for heavyweight mesh), which approached statistical significance ($P = .052$).^[11]

It was observed in our study that there were 2.9% recurrence rates on long term follow up of patients in both the groups. These were discordant to research conducted by Gralund et al which showed superiority of vypro mesh with less recurrence rates on long term follow up.^[12]

CONCLUSION

All novel prosthetics have their own set of known postoperative complications, be it Prolene or Vypro mesh.

The present study was done for two years with a follow up period of 6 months. A total of 70 patients were included in the present study and with patients in both Prolene and Vypro group accounting to 35 each.

Results of the study were inferred and it was found that both meshes were similar in certain aspects. However, Vypro mesh was found to be superior in terms of post operative pain, seroma formation, foreign body sensation and duration of hospital stay. There was no significant difference in recurrence rates of hernia between two groups after 6 months of follow up of patients.

Present study concluded that Vypro mesh is superior to Prolene mesh in long term outcomes of chronic pain and foreign body sensation.

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