



To Study the Outcome of Inguinal Hernia Repair with Sutureless Self-Gripping Mesh in Terms of Postoperative Pain, Complications and Recurrence

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Abstract

The concept of sutureless mesh as well as light weight mesh came into play because of inguinodynia. This study was chosen most importantly to determine the post-operative persisting chronic pain after the use of sutureless mesh. Data was collected from patients attending Govt. Medical College & Hospital, Jammu OPD, admitted in the department of surgery that underwent sutureless mesh hernioplasty for inguinal hernias. These patients were followed up at 3 days, 3 weeks, 3 months and 6 months for postoperative pain, any recurrence or development of complications. In this study, 40 patients having inguinal hernia were taken. 38 (95%) were males and 2 (5%) were females. The age of the patients ranged between 30 to 80 years with mean age of 54.53 ± 14.88 years. Post-operative pain was studied according to VISUAL ANALOG SCALE scoring, out of 10. Mean post-operative pain score after 3 days was 2.70 ± 1.16 , which decreased to 0.85 ± 1.10 at 3 weeks (68.52% decrease) and after 3 months it was 0.30 ± 0.72 (with an 88.89% decrease). There were no other complications. The study concluded that the use of self-fixating mesh in open inguinal hernia repair is a simple, safe, rapid and effective option and is associated with low post-operative pain.

Key Words

Hernioplasty, Inguinal Hernia, Inguinodynia, Sutureless Mesh

Introduction

Hernia is derived from hernios, Latin word "Rupture". It is defined as an abnormal protrusion of tissue or organ in the body at various sites. Most frequently seen hernia is in the inguinal region (1). Inguinal hernias are more common on the right side than left side and male to female ratio is 10:1, while indirect to direct is 2:1. Among adults the annual frequency of groin hernia repairs was found from 0.25% at 10 years to 4.2 % at 80 years (2). The lifetime risk of development of groin hernia is 27% in men and 3% in women. The frequency of surgical correction varies among countries and ranges from 10 per 1 lakh population in UK to 1 per 28 lakh population in the United States (3).

Now a days most commonly used technique is 'Lichtenstein tension free hernioplasty' which is an open mesh repair technique devised in 1986. Its benefit was that recurrence rates reduced to <2% (3). Although the overall complication rate has been estimated to be 10% but most of them are transient. These include postoperative urinary retention, urinary tract infection, orchitis, surgical site infection. And long-term complications include inguinodynia and recurrence. Inguinodynia has replaced recurrence as primary complication after open inguinal hernia repair (4).

A new self-gripping mesh (ProGrip; Covidien) has been developed which uses sutureless technique. It is a

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polyester mesh, with its unique balance of properties provides fast and true tissue in growth with reduced foreign material reactions. It allows surgeons to secure the mesh in less time and provide patient better comfort post-surgery (5).

This topic has been taken into consideration in view of high incidence of inguinodynia. The concept of sutureless mesh as well as light weight mesh came into play because of inguinodynia. This study was undertaken to study the outcome of inguinal hernia repair with sutureless self-gripping mesh in terms of postoperative pain, complications, and recurrence.

Material and Methods

The study was conducted prospectively in Government Medical College and Hospital, Jammu on patients that fitted into our inclusion criteria and in these patients sutureless mesh of 14 X 9 cm was used (which is a biocomponent mesh consisting of monofilament polyester with resorbable Polylactic acid microgrip technology that is designed to provide a secure & durable repair).

Inclusion criteria: All cases > 18 years with unilateral or bilateral inguinal hernia.

Exclusion criteria: Obstructed and strangulated inguinal hernias; infected site; age <18 years.

Data has been collected from patients attending Govt. Medical College and Hospital, Jammu OPD, admitted in the department of surgery that underwent suture less mesh hernioplasty for inguinal hernias. The patients were evaluated and followed up according to protocol which includes history, clinical examination and routine investigations in all cases. Written informed consent was taken. All patients were operated in elective operation theatres by senior operating surgeons.

Technique of mesh fixation: The mesh was presented, slit upward, flap open, colored yarn marker towards the pubis, pin side facing the deep muscular plane. Mesh was fitted with the slit along the cord. Flap was folded back onto the mesh. Gripping was reversible to allow slit closure to be adjusted several times. Mesh was spread out with the large curve of the mesh so that it perfectly fitted the inguinal ligament. Then the mesh was completely spread, centering by positioning the cord in the central orifice to cover the weak areas. The external oblique aponeurosis and cutaneous incision were sutured.

These patients were followed up at 3 days, 3 weeks, 3

months and 6 months after surgery and observed for complications and other parameters as per study protocol.

Mechanical characteristics and gripping strength evaluation of the new self-gripping mesh

Mechanical characteristics

- Surface density (g/m²)

Before PLA resorption	82
After PLA resorption	41
- Thickness (mm) 0.5
- Porosity (%) 91

Gripping strength evaluation (N/cm)

- New self-gripping mesh 21.4 ± 5.7
- Standard textile 5.2 ± 0.9

Results

In present study, 40 patients having inguinal hernia were taken. The age of the patients ranged between 30 to 80 years with mean age of 54.53±14.88; the maximum number of patients were in the age group of 51-60 years (Table 1). There were 38 males (95%) and 2 females (5%) (Table 2). 22 (55%) had right sided hernia, 15 (37.50%) had left sided hernia and 3 patients (7.50%) had bilateral hernia (Table 3). 9 patients (52.50%) had comorbidities like diabetes mellitus, 9 (22.50%) hypertension and one patient (2.5%) had hypothyroidism (Table 4).

In our study, postoperative pain was studied according to VISUAL ANALOG SCALE scoring, out of 10. Mean postoperative pain score after 3 days was 2.70±1.16, which decreased to 0.85± 1.10 at 3 weeks

Table 1: Distribution of Patients According to Age

Age (Years)	Number of Patients	Percentage
≤40	9	22.50
41-50	7	17.50
51-60	10	25.00
61-70	7	17.50
>70	7	17.50
Range	30 – 88	
Mean Age ± SD	54.53±14.88	

Table 2: Sex Distribution

Sex	Number of Patients	Percentage
Male	38	95.00
Female	2	5.00



(68.52% decrease) and after 3 months it was 0.30 ± 0.72 (with an 88.89% decrease) (Table 5). No recurrence was seen within 6 months of surgery (Table 6), and none

Table 3: Side Involved

Side Involved	Number of patients	Percentage
Left	15	37.50
Right	22	55.00
Bilateral	3	7.50

Table 5: Postoperative Pain

Postoperative Pain	Mean \pm Standard Deviation	Percent Decrease
3 days	2.70 ± 1.16	-
3 weeks	0.85 ± 1.10	68.52
3 months	0.30 ± 0.72	88.89

Table 7: Rest Postoperative Complications Observed for 3 Months

Postoperative Complications	Yes		No	
	No. of Patients	Percentage	No. of Patients	Percentage
Seroma	0	0.00	40	100.00
Induration	0	0.00	40	100.00
Testicular Atrophy	0	0.00	40	100.00

Discussion

Inguinal hernia is one of the most common diseases that a surgeon has to manage. And repair of inguinal hernia is one of the commonest surgical procedures done worldwide. Improved surgical techniques and a better understanding of the anatomy and physiology of the inguinal canal have significantly improved outcomes for many patients (6). Such a large volume of procedures suggests that even modest improvements in patient outcomes would substantially improve population health.

The ideal outcome in inguinal hernia surgery is aimed at providing pain and recurrence free repair while minimizing the morbidity and associated complications that the patient may experience and Lichtenstein tension free mesh repair has become the gold standard for open inguinal hernia repair in the last two decades (7).

In our study, majority of the patients were in the age group between 30 to 88 years. Mean age distribution was 54.53 ± 14.88 , with the maximum number of patients in sixth decade. Batabyal *et al.* (8) in their study noted that the mean age of the patients was 63 year. Pieredes *et al.* (3) found in their study that mean age in self-fixating mesh groups was 55 years (ranging 20 to 79 years) and 53 years in the other group (ranging 19-80 years). Quyn *et al.* (9) in their study found mean age to be 62.3 ± 7.76

of the 40 patients developed seroma, induration, testicular atrophy, or surgical site infection during a follow up of 3 months (Table 7).

Table 4: Comorbidities

Comorbidities	Number of Patients	Percentage
Diabetes Mellitus	9	22.50
Hypertension	9	22.50
Hypothyroidism	1	2.50
Nil	21	52.50

Table 6: Recurrence within 6 Months

Recurrence within 3 Months	Number of Patients	Percentage
Yes	0	0.00
No	40	100.00

years in self-fixating group whereas it was 61.9 ± 15.74 years in the other group. Wang *et al.* (10) in their study found mean age to be 48.7 years.

In our study of 40 patients, 95 percent were males (38 patients) and rest 5 percent were females (2 patients). Batabyal *et al.* (8) in their study observed 89% patients to be males and rest 11% to be females. Yilmaz *et al.* (11) observed that out of 60 patients 57 were males (95%) and 3 females (5%). Tarchi *et al.* (12) in their study observed that 94.3% patients were males and 5.7% were females.

This study was mainly done to study the incidence of inguinodynia post self-adhesive mesh usage. In our study, postoperative pain was studied according to Visual Analogue Scale scoring system. Mean postoperative pain after 3 days was 2.70 ± 1.16 , which decreased to 0.85 ± 1.10 at 3 weeks (68.52% decrease) and after 3 months was 0.30 ± 0.72 (with an 88.89% decrease). José Bueno-Lledó *et al.* (13) compared VAS scoring of the two groups at 48 hours and found ProGrip group to be having a mean VAS of 4.9 ± 2.1 and the other group mean VAS of 8.1 ± 2 . Chastan *et al.* (14) observed mean VAS at the time of discharge to be 1.1 ± 1.2 on the left side and 1.4 ± 1.4 on the right side which decreased after one month to 0.3 ± 0.6 on the left side and 0.1 ± 0.4 on the right side. Yilmaz *et*



al. (11) found in their study that self-fixating group patients had a mean VAS of 1.5 at 7th post-operative day and 0.6 at 4 weeks after surgery, compared to 4.4 in fixation group after 7 days and 1.33 seen 4 weeks later. Wang *et al.* (10) found in their study that VAS decreased from 32 to 10.6 on 1st postoperative day to 0.67 ± 2.5 at 6 months post operatively.

In another study conducted by Verhaegen *et al.* (15), the mean VAS at 3 weeks was found to be 5.0 in self-fixating group and 10.6 in suture group. Batabyal *et al.* (8) observed 97% patients to be free of pain 4 weeks post surgery. Quyn *et al.* (9) observed that incidence of pain at 6 months to be 7.9% in sutureless group and 21% in fixation group and at 1 year to be 6.3% in former and 18.8% in later group, with a p value < 0.05. Jorgansen *et al.* (16) observed that moderate to severe symptoms occurred in 17.4 % patients with sutureless mesh whereas 20.20% seen in prolene mesh group. They concluded that avoidance of suture fixation techniques was not accompanied by a reduction in chronic symptoms after inguinal hernia repair. Pieredes *et al.* (3) observed chronic pain and discomfort in 36.3% patients in self-adhesive group, as compared to 34.1% in the other group, with p value < 0.658 which was statistically not significant. Sanders *et al.* (17) observed that there was no significant difference in postoperative scores at 1 month, 3months and 1-year post operatively.

In our study of 40 patients, no recurrence was seen in a follow up period of 6 months. No patient developed postoperative seroma, induration, surgical site infection and testicular atrophy.

Conclusion

The study concluded that the use of self-fixating mesh in open inguinal hernia repair is a simple, safe, rapid and effective option and is associated with low post-operative pain. However, the time for follow-up of patients to look for recurrence was less (6 months) as the study duration was only of one year. It is advised to continue the study forwards to look for better recurrence follow-up.

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