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# A comparative study of assessing Inguinodynia in open inguinal hernia repair while fixing mesh with polyglactin sutures (Vicryl) Vs Polypropylene sutures (Prolene)

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**Abstract**

**Background:** *Globally, Inguinal hernia forms the major entity among all other hernias .Chronic groin pain can be a result of nerve entrapment while operating. Mesh repair leads to an inflammatory reaction over a period of time, though the exact cause of pain remains elusive. This study aims to compare the effectiveness of polyglactin vs prolene sutures in the reduction of postoperative pain in inguinal hernia surgeries.*

**Methods:** *A one year hospital prospective study in Government Vellore Medical College. A total of 60 adult patients were divided into two groups of 30 each .Mesh fixation with polyglactin sutures was Group A (30) and prolene sutures was Group B (30) and their post operative pain was assessed. Follow up was for 3 months. Collected data was analyzed using Chi square test and T test*

**Results:** *Our analysis showed that the incidence of postoperative groin pain in the polyglactin research group was significantly lower .From the start of the first follow up to the fourth, the mean pain score decreased on average more in Group A (0.770.63) than in group B (1.300.79) with a significant difference (p=0.0023)*

**Conclusion:** *The post operative chronic groin pain was significantly reduced in the study group in whom polyglactin sutures were placed instead of prolene sutures and hence routine usage of polyglactin sutures to fix a mesh is a safe and effective alternative to polypropylene sutures in Lichtenstein hernia repair*

## Introduction

The Lichtenstein procedure is popular for hernia repair because it is simple to learn and has a low incidence of problems and recurrences. Although they constitute an issue, meshoma, seroma, and problems from the plug and mesh migrating are rare. Reducing consequences like chronic groin pain discomfort should be the new goal in primary hernia surgery today.

Chronic pain following hernia repair have a significant impact on quality of life.. The number of patients reporting pain following hernia repair more than a year after surgery has increased, according to studies from the mid 1990s.

Following hernia surgery, neuralgia is characterised by burning sensation, altered sensitivity (hypoesthesia, hyperesthesia, paresthesia). The causes of this issue can be non-neuropathic, neuropathic, or a combination of

both. Neuropathic pain may result from injury to nerve, perineural fibrosis, sutures, staples, or tacks compressing one or more nerves. Mechanical pressure from folded or wadded mesh, scar tissue formation, periosteal response are examples of non-neuropathic reasons. Therefore, persistent groin discomfort could be reduced if the use of sutures and device fixation could be restricted.

**Aims and Objectives**

To compare the effectiveness of mesh fixation with polyglactin sutures (vicryl) versus polypropylene suures (prolene) in assessing inguinodynia in open inguinal hernia repair.

**Objectives**

- To know the advantage of using vicryl sutures while fixing mesh in open inguinal hernioplasty.
- To compare the post-operative outcomes of mesh fixation with non-absorbable vs delayed absorbable suture material

**Review of Literature**

**Complications of Hernia Surgery**

**1. Chronic Groin Pain (Inguinodynia):**

The genital branch of the genitofemoral nerve (GFN), the ilioinguinal nerve (IIN), the iliohypogastric nerve (IHN), and, sporadically, the lateral femoral cutaneous nerve are the nerves implicated (LFN).

There are two forms of inguinodynia: neuropathic and nociceptive.

**Neuropathic pain-**

Stretching, crushing, cautery, tacking sutures, stapling, or direct transection can all result in intraoperative injury. After surgery, the nerves may become trapped in a "meshoma," suffer damage from excessive fibrosis, or develop granulomas.

**Nociceptive pain:**

There are several categories within nociceptive pain:

1) Nociceptive inflammatory pain: Caused by excessive fibrosis, also known as "meshoma," which develops as a result of mesh-related fibrosis.
2) Somatic nociceptive pain: Periostitis pubis, a serious condition brought on by the mesh's attachment to the pubic tubercle
3) When the spermatic cord or the intestines (including residual or recurring hernias) are affected by the mesh, visceral nociceptive pain develops.

**Chronic post-herniorrhaphy inguinodynia risk factors include:**

a) Young age,
b) female gender
c) a high preoperative pain score are all preoperative variables
d) Recurrent hernia surgery
e) and impairment of everyday activities
f) decreased preoperative optimism
g) genetic predisposition (HLA haplotype DQBI*03:02)

**Diagnosis**

The diagnosis is frequently difficult, and the area of pain is not clearly defined in contrast to if normal nerve anatomy persisted. This is because the three nerves' sensory areas overlap, nerves regenerate after injury, and nerve endings intertwine.

Tinel's test, which involves tapping the skin over a region of localised tenderness with reproduction of pain medial to the anterosuperior iliac spine, may help with the diagnosis.

Diagnostic nerve blocks can be useful in the case of neuropathic pain in order to identify the nerves that are affected. In the case of non-neuropathic pain, imaging modalities like CT scan or MRI will highlight pathologies like granulomas, neuromas, mesh-related pathologies, or recurrent hernias. The initial test used to find occult hernias is typically ultrasound.

**Criteria for Eligibility**

**A. Inclusion requirements:**

- Patients who elect to have Lichtenstein mesh hernias
- Uncomplicated hernia,
- Age range of 18 to 70 years,
- Unilateral or bilateral.

**B. Disqualifying factors**

- Hernia that recurs
- Presenting an emergency
- A femoral hernia
- Younger than 12 years old
- Problems with coagulation
- Current chemotherapy
- Ailments affecting connective tissue
- Patients with mental illnesses or physical ailments that may interfere with their capacity to perceive and elaborate discomfort

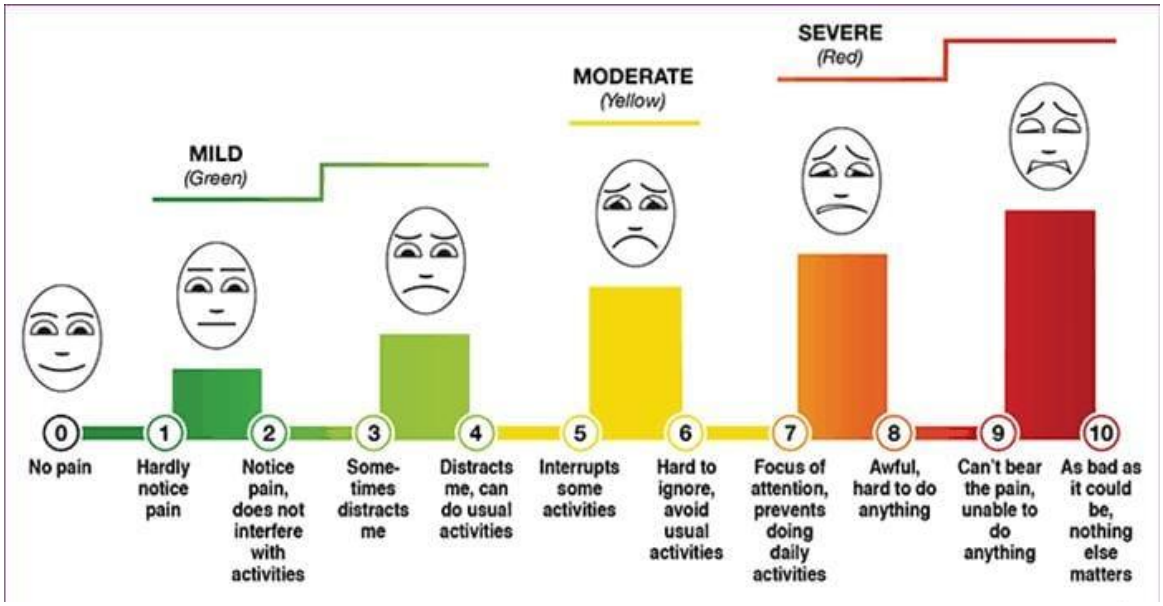
**Methodology**

Under spinal anaesthesia, Incisions were made in the skin and subcutaneous tissue (Camper's and Scarpa fascia). Aponeurosis of the external oblique was opened. The cord could be found. Without opening it, the direct inguinal hernial sac was reduced back. The indirect ones were cut out, transfixed, and separated after reducing contents. The posterior wall was then covered with a prolene mesh behind the cord.

To avoid periostitis, the mesh was stitched to the conjoint tendon and inguinal ligament in an interrupted pattern, with the initial stitch placed 1 cm lateral to the pubic tubercle. Vicryl 2-0 was used to secure the mesh for one group of patients (group A), and prolene 2-0 was used for the other group of patients (group B).Continuous absorbable sutures were used to approximate the subcutaneous tissues and external oblique aponeurosis. The skin was sutured using non-absorbable sutures. Patients from all groups received the same analgesics following surgery: Injection paracetamol 1 gm i.v. every 12 hours.As needed, 650 mg of oral paracetamol was later administered.

Excel was used to enter the data, while SPSS version 12 was used for analysis.

The categorical data were summarised as percentages, whereas the continuous variables were summarised as mean (SD). Chi square and t tests were used to observe the relationships. P values below 0.05 were deemed significant.




**Pain Measurement Scale**

## Results

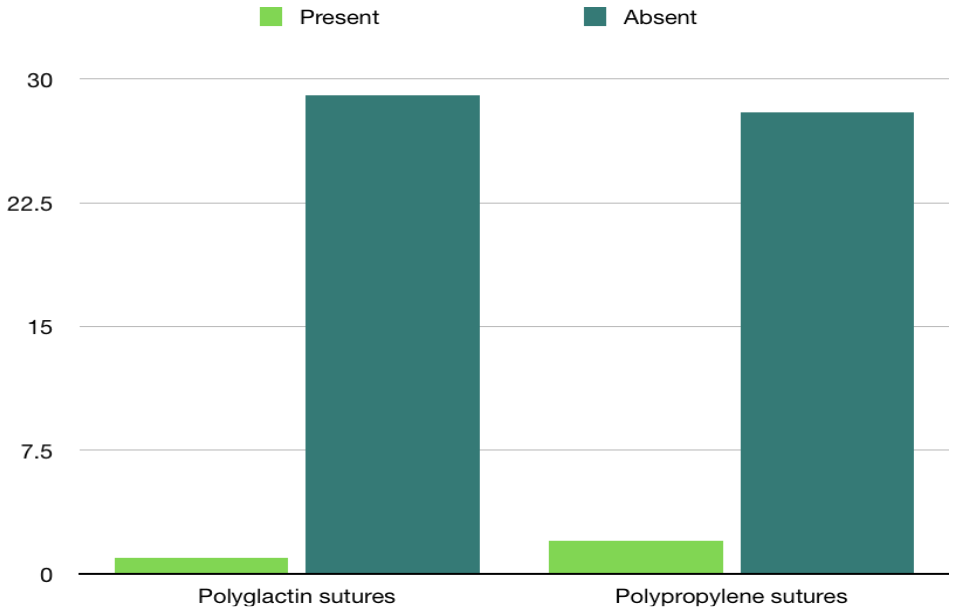
**Age distribution**: The majority of study participants are between the ages of 60 and 70,and the majority of individuals in the control group are in their 40s to 50s.

| | Polyglactin Sutures | | Polypropylene sutures | |
|---|---|---|---|---|
| | Frequency | % | Frequency | % |
| <20 | 1 | 3.3 | 2 | 6.6 |
| 21-30 | 3 | 10 | 3 | 10 |
| 31-40 | 3 | 10 | 5 | 16.7 |
| 41-50 | 6 | 20 | 8 | 26.7 |
| 51-60 | 8 | 26.7 | 7 | 23.3 |
| 61-70 | 9 | 30 | 4 | 13.4 |
| >70 | 0 | 0 | 1 | 3.3 |
| Total | 30 | 100 | 30 | 100 |

### Comparison of Seroma Formation

Seroma occurred in 3.3% (1/30) of the Study group and 6.6%(2/30) of the Control group. With a p value of 0.03, this difference was statistically significant.

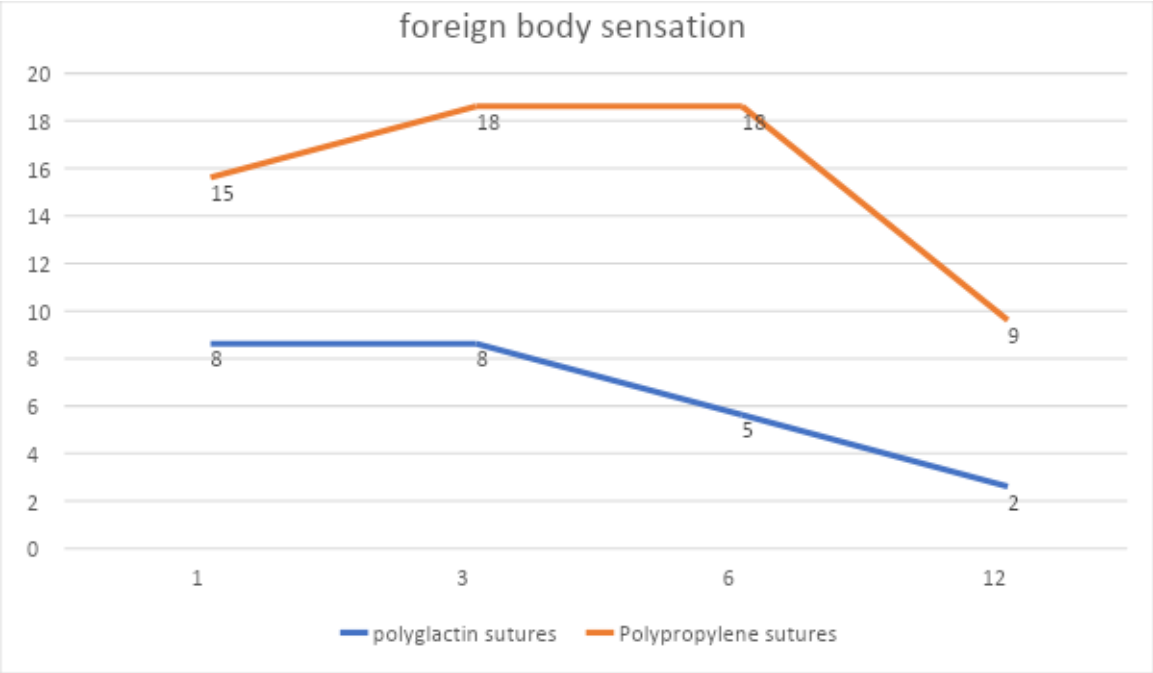
| Seroma formation | Polyglactin Sutures | Polypropylene sutures |
|---|---|---|
| Present | 1 | 2 |
| Absent | 29 | 28 |




### Comparison of foreign body Sensation

In comparison to the control group's 30% (9/30), the study group's 6.6% (2/30) incidence of the feeling of a foreign body was significantly lower. With a p value of 0.01 this difference was statistically significant.

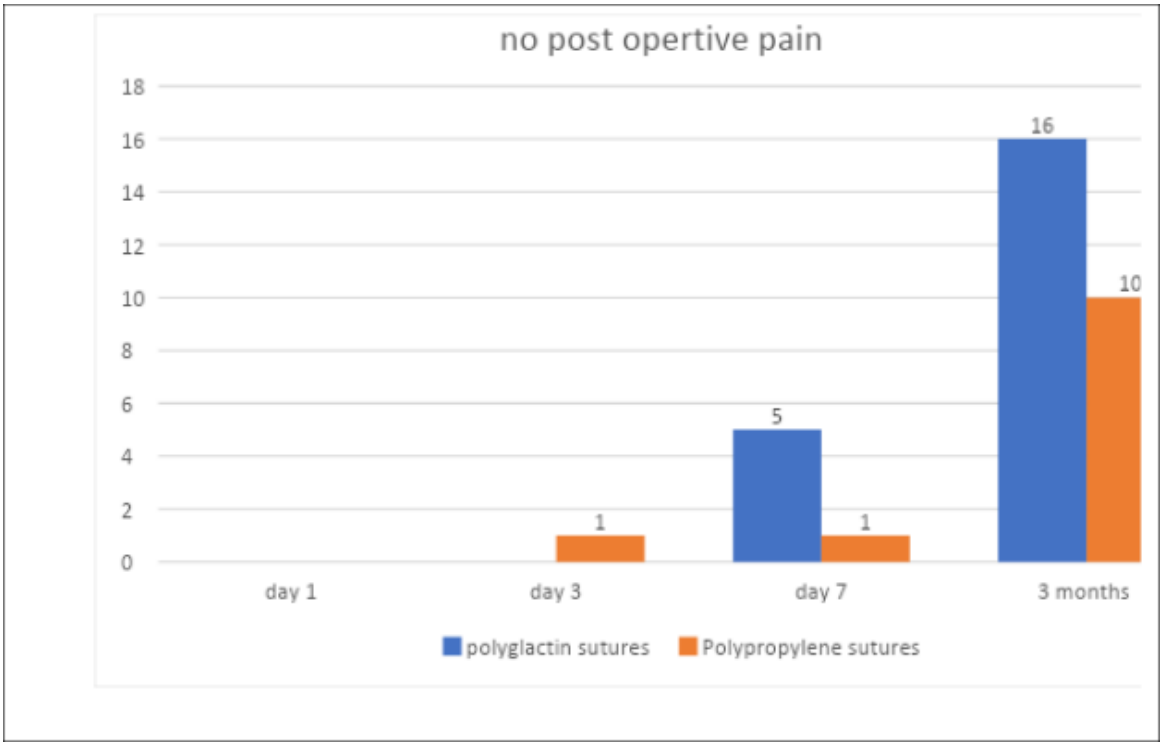
| Follow up (months) | Polyglactin Sutures | | Polypropylene sutures | |
|---|---|---|---|---|
| 1 | 8 | 26.6 % | 15 | 50 % |
| 3 | 8 | 26.6 % | 18 | 60 % |
| 6 | 5 | 16.3 % | 18 | 60 % |
| 12 | 2 | 6.6 % | 9 | 30 % |




**Comparison of Post-Operative Analgesia Requirement**

All of the participants in both groups needed analgesia within the first 24 hours following surgery. In the current study, out of 30 patients in each group, 63% reported mild pain, compared to 37% who reported moderate pain; however, in the polyglactin group, 57% reported mild pain, compared to 43% who reported moderate pain. On evaluating the moderate pain and severe pain, there was a significant difference between the study groups at the 5% level of significance. In the polyglactin group, 63% of study participants reported no pain at three months, compared to 33% in the polypropylene group. This difference was shown to be statistically significant.

| **Pain** | **Polyglactin sutures** | | | | **Polypropylene sutures** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day 1 | Day 3 | Day 7 | 3 months | Day 1 | Day 3 | Day 7 | 3 months | P value |
| No | 0 | 0 | 5(16.5) | 19(63.3) | 0 | 1(3.3) | 1(3.3) | 10(33.3) | 0.04 |
| Mild | 19(63%) | 18(60) | 19(63.6) | 11(36.7) | 17(57) | 14(46.7) | 13(43.3) | 17(56.7) | 0.01 |
| Moderate | 11(37%) | 12(40) | 6(20) | 0(0) | 13(43) | 12(40) | 16(53.3) | 3(10) | 0.65 |
| Severe | 0 | 0 | 0 | 0 | 0 | 3(10) | 0 | 0 | 0.3 |
| Total | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |


no post opertive pain
18
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day 1
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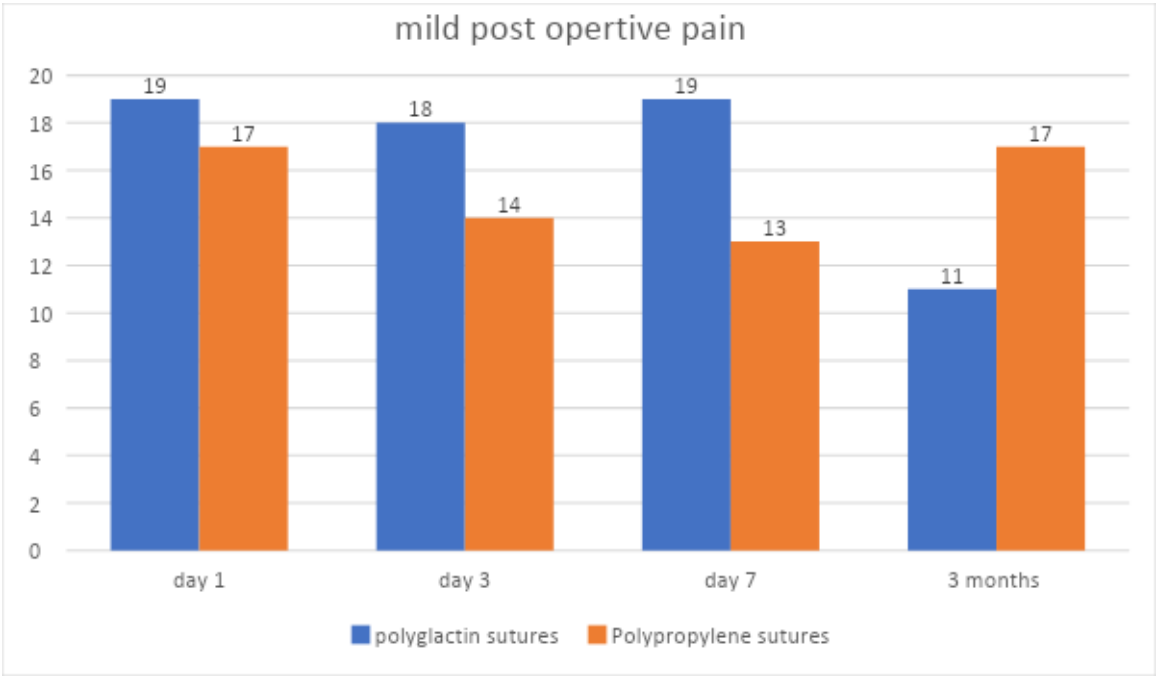
3 months
polyglactin sutures
Polypropylene sutures


mild post opertive pain
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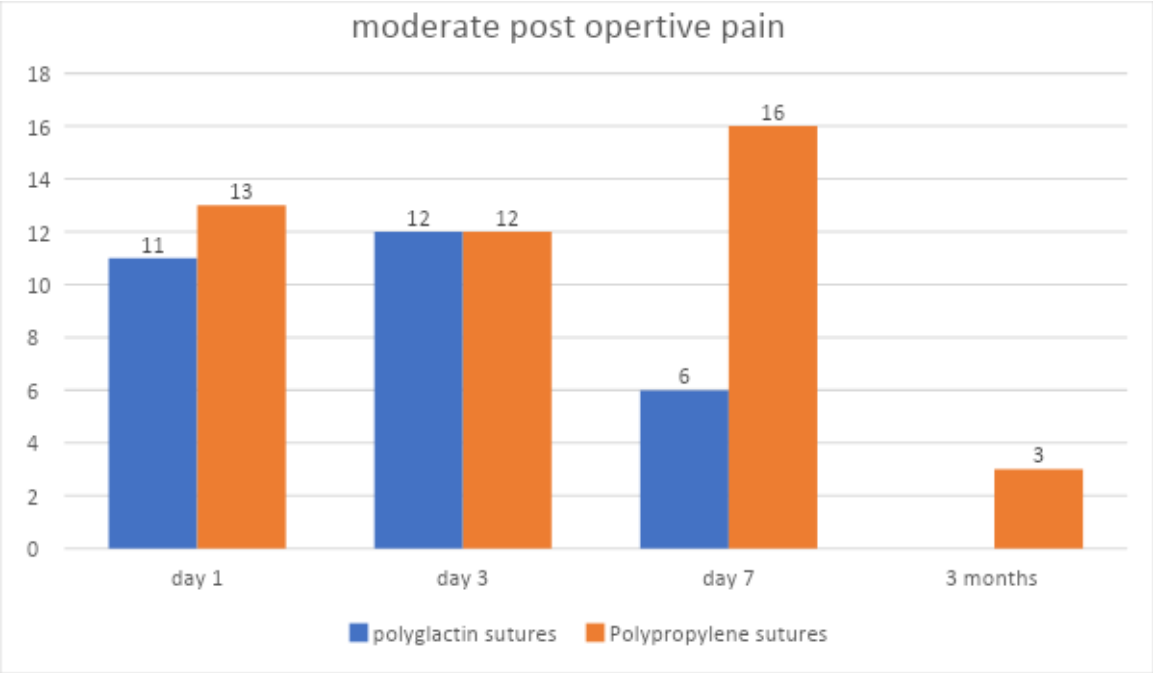
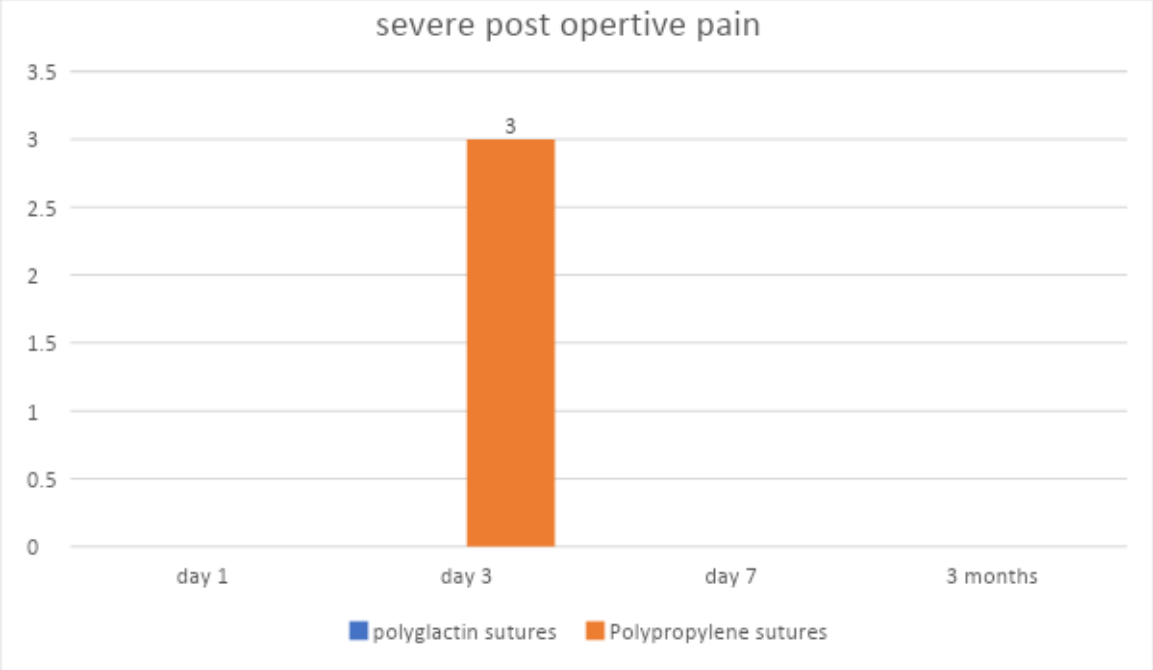
polyglactin sutures
Polypropylene sutures




**Other Complications**

**Recurrence**

The incidence of recurrence in both the study groups was nil.

**Prolene Granuloma**

Furthermore, among the research population, only one person in the prolene group developed a prolene sinus.

**Discussion**

60 patients who underwent Lichtenstein's hernioplasty for inguinal hernia were compared in this prospective comparison study, 30 of them had mesh fixed with polyglactin sutures and the other 30, with polypropylene sutures. In the current investigation, it was discovered that the polyglactin group had the highest prevalence in this age range, 60 to 70.In contrast, the

polypropylene group had more individuals who were 40 to 50 years old and were male.

In this study, the Study group had a 3.3% (1/30) seroma incidence, which was lower than the Control group's 6.6%(2/30) incidence. With a p value of0.03, this difference was statistically significant.

In our investigation, the study group experienced a foreign body sensation 6.6% of the time(2/30), which was significantly smaller than the control group's prevalence of 30% (9/30).

With regard to the pain scores there was a significantly lesser scores of pain in group A compared to other group. In terms of pain assessments, group A had much lower scores of pain than the group B. The average pain scores for group A on the first and third days indicated no evidence that those who reported discomfort at these two times were more likely to be in the polypropylene group than the polyglactin group. However, it was discovered that the pain scores were lower in the polypropylene study groups in cases of the third and fourth follow-up. Between the start of the first follow-up and the end of the fourth follow-up, the mean pain score decreased on average substantially more in group A(0.770.63) than in group B(1.300.79) (p=0.0023).

**Conclusion**

Based on the findings of the present study it may be concluded that, using polyglactin suture material to fix mesh is a safe, simple as well as an effective alternative to the conventional usage of polypropylene sutures for fixing the mesh in Lichtenstein hernia repair. The post- operative pain on the day 7 and after 3 months it is significantly less.

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