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Research Article

# The Effect of Mesh Fixation Methods on Pain Sensation After Laparoscopic Inguinal Hernia Repair

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**Abstract**

**Aim:** Groin hernia repair is one of the most common surgical procedure in general surgery. The use of prosthetic meshs has reduced the recurrence rate after inguinal hernia repair to less than 5%. Chronic pain is thought to be multi-factorial. Among these, surgical-related factors are the types of mesh used and fixation methods. It was aimed to evaluate the effect of the use of absorbable and non-absorbable screws for mesh fixation on post-operative pain during TEP repair.

**Material and Methods:** The data of patients who were operated on by a single surgeon and who underwent TEP repair for unilateral or bilateral inguinal hernia were reviewed retrospectively. Post-operative first-week pain sensations were compared between patient groups in which absorbable and non-absorbable screws were used for patch fixation.

**Results:** A total of 35 patients who were operated by a single surgeon and who underwent laparoscopic total extraperitoneal (TEP) repair for unilateral or bilateral inguinal hernia were included in the study. It was found that patients in the absorbable screw group felt statistically significantly less pain [VAS: 3 (2-7) vs. 4 (2-8); p=0.03].

**Conclusion:** Chronic pain after patchy hernia repair is also seen as a late complication that can last up to 6 months. This study, which proves that the use of absorbable stabilizers leads to less pain in the early period, reveals that this method may also be a suitable method for preventing the development of possible chronic pain.

**Keywords:** Hernias, inguinal hernias, surgical mesh, surgical fixation, Laparoscopy, TEP repair

## INTRODUCTION

Groin hernia repair is one of the most common surgical procedure in general surgery. More than 20 million groin hernia surgery are performed yearly in the world (1).

In the surgical history, conventional repair techniques were applied at the beginning. These techniques, which have a high recurrence rate and related with severe post-operative pain, have been replaced by tension-free mesh repair techniques over time (2). The use of prosthetic meshs has reduced the recurrence rate after inguinal hernia repair to less than 5% (3). However, chronic pain still remains a major complication. Chronic pain and its effect on quality of life is nowadays one of the most important problem after hernia surgery. The etiology of chronic pain is thought to be multi-factorial. Among these, surgical-related factors are the types of mesh used and fixation methods (4).

Sutures, screws, staples, self-adhesive meshes, fibrin or other tissue adhesives are used to fix the mesh. Although there are studies on the superiority of the different fixation methods used over each other, there is no consensus on this issue (5).

In this study, it was aimed to compare absorbable and non-absorbable fixation techniques in terms of post-operative pain.

## MATERIAL AND METHOD

The study was designed retrospectively. A total of 35 patients who were operated by a single surgeon and who underwent laparoscopic total extraperitoneal (TEP) repair

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for unilateral or bilateral inguinal hernia were included in the study. The patients were divided into two groups according to the fixation method of the mesh used during the surgery. Pain sensations of patients at postoperative 1 week follow-up were evaluated using a standardized visual analog pain scale (VAS). Descriptive statistics are given as frequency (percentage) for categorical data and as median (minimum-maximum) value for numerical data. Chi-square or Fisher's exact test was used to compare categorical data between groups, and Mann-Whitney U test was used to compare numerical data. The study received ethics committee approval with the number TCTR20230427008.

## RESULTS

The median age of all patients included in the study was 42 (19-72), and the patients were predominantly male (except for two female patients). In total, 23 patients had bilateral inguinal hernias. There was no significant difference between the groups in terms of demographic data (Table 1).

When the pain scores of the patients were evaluated, it was found that the patients in the absorbable screw group felt statistically significantly less pain [VAS: 3 (2-7) versus 4 (2-8); p=0.03] (Table 2).

**Table 1. Demographic datas**

| Variable | Total N: 35 | Absorbable N: 14 | Non-absorbable N: 21 | P Value |
|---|---|---|---|---|
| **Age*** | 42 (19-72) | 36 (19-72) | 46 (25-68) | 0.23 |
| **Gender** | | | | 0.77 |
| **Female** | 2 (%5.7) | 1 (%0.7) | 1 (%0.4) | |
| **Male** | 33 (%94.3) | 13 (%99.3) | 20 (%99.6) | |
| **Sides** | | | | 0.76 |
| **Unilateral** | 12 (%34.2) | 6 (%42.8) | 6 (%28.5) | |
| **Bilateral** | 23 (%65.8) | 8 (%57.2) | 15 (%71.5) | |

*Median (min-max), ŝFrequency (percent)

**Table 2. Comparison of pain scores between groups**

| | Total N=35 | Absorbable n=14 | Non-absorbable n=21 | P value |
|---|---|---|---|---|
| **VAS*** | 4 (2-8) | 3 (2-7) | 4 (2-8) | 0.03 |

* Median (min-max)

## DISCUSSION

After decreasing recurrence rates with the use of prosthetic meshs, inguinal pain is one of the most important problem developing after surgery (4). Approximately 16% of patients complain of post-operative pain (6). Multiple hypotheses regarding the mechanism of pain have been put forward (6) and no consensus has been found (6–8). This uncertainty also complicates the postoperative pain management, therefore it is important to reduce the factors that may cause pain in hernia surgery.

Fixation methods used during hernia repair have often been blamed as the cause of pain, and many studies with conflicting results have been conducted on this subject (9–12). However, studies on whether there is a relationship between patients' perception of early pain and the possibility of late pain have revealed that pain sensation in the first week is an important predictor of the development of chronic pain (13). There are three methods for mesh fixation including suture, self-gripping and glue (14). Recurrence rates and risk of chronic pain are similar for both techniques (14). The main factors for chronic pain are tissue trauma and nerve injury during surgery (14). With comparing surgical techniques, laparoscopic techniques including totally extraperitoneal (TEP) and Transabdominal preperitoneal (TAPP) are superior than open techniques for chronic pain and cosmetic results (15). Some studies show that there is no need for mesh fixation in TEP technique but most preferred method is fibrin sealant (15). Because of high incidence of chronic inguinal pain, some studies especially investigate heavyweight and lightweight meshes versus non-fixation technique (16). Early results showed that there is no increased risk for recurrence in non-fixation technique (16). In this study, we examined the effect of fixation methods on early period pain in patient group. It was shown that the patient group in which absorbable screws were used for fixation had statistically significantly less pain sensation in the early period pain assessments made on the VAS (p=0.03). However, the limitation of this study is that it evaluated pain sensation only in the early period and in addition to this, the study has low-volume patient. Chronic pain after patchy hernia repair is also seen as a late complication that can last up to 6 months (6).

## CONCLUSION

In conclusion, this study, which proves that the use of absorbable screws causes less pain in the early period, reveals that be a suitable method for preventing possible chronic pain development.

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***Conflict of Interest:*** *The authors declare that they have no competing interest.*

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