

## ORIGINAL RESEARCH

## Comparative study between tack fixation versus non-fixation of mesh in laparoscopic trans abdominal pre peritoneal inguinal hernia repair

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### ABSTRACT

**Background:** Inguinal hernia is one of the most prevalent surgical disease in clinical practice. Laparoscopic inguinal hernia repair has been shown to be slightly superior to open approaches and is performed with placement of mesh into the pre peritoneal space. Mesh fixation is thought to increase postoperative pain and risk of nerve injury (femoral branch of genitofemoral nerve and the lateral cutaneous nerve of thigh). Non-fixation of the mesh can reduce pain; however it is theoretically a predisposing risk factor for hernia recurrence due to the risk of mesh displacement. The purpose of this study is to compare mesh fixation with non-fixation in terms of postoperative pain, incidence of nerve injury, incidence of recurrence of hernia during laparoscopic Trans Abdominal Pre-Peritoneal hernia repair **Methodology:** Patients visiting OPD or admitted in ward will be explained about the study and on willingness will be enrolled up after written informed consent is obtained. Will be divided alternately into the 2 groups. One group will undergo TAPP with fixation of the mesh and the other without. **Results:** 10 patients with direct inguinal hernia and 15 indirect hernia in mesh fixation group. 14 patients with direct inguinal hernia and 11 patients with indirect inguinal hernia were in non-fixation group. All patients were operated under general anesthesia. Laparoscopic converted open hernioplasty cases were excluded. There were 24 patients in tack fixation group and 11 patients in non-fixation group required rescue analgesia at 8th hour of postoperative period. The difference of both groups were statically significant. The hospital stay in our study was 1 day and discharged on 2nd postoperative day. No recurrence in this study. **Conclusion:** non-fixation of mesh can significantly reduces the post operative pain in LAP TAPP.

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### INTRODUCTION

Inguinal hernia is the one of the most common disease in surgical practice. Laparoscopic inguinal hernia repair has been shown to be slightly superior to open approaches as they cause less postoperative pain, shorter hospital stay and faster recovery when compared to open hernia repair. Laparoscopic Inguinal hernia repair, performed with placement of mesh

into the pre peritoneal space, can be done by Trans abdominal Pre peritoneal approach or by Total Extra peritoneal approach.

TAPP approach was first reported by Arregui. It involves laparoscopic access into the peritoneal cavity to place a mesh in the preperitoneal space after reduction of hernia sac. Mesh fixation is thought to increase postoperative pain and risk of nerve injury, most commonly injured nerves being the femoral branch of genitofemoral nerve and the lateral cutaneous nerve of thigh. Non fixation of the mesh can reduce pain; however it is theoretically a predisposing risk factor for hernia recurrence due to the risk of mesh displacement.

The purpose of this study is to compare mesh fixation with non-fixation in terms of postoperative pain, incidence of femoral nerve injury, incidence of recurrence of hernia during laparoscopic Trans Abdominal Pre Peritoneal hernia repair.

### **AIMS AND OBJECTIVES**

**Primary aim of study:** To compare the pain among tack fixation versus non-fixation of mesh group in Laparoscopic Trans Abdominal Pre-Peritoneal Inguinal hernia repair.

**Secondary aims of the study:** To evaluate the study related complications like femoral nerve injury, rescue analgesia requirement , seroma , urinary retention, urinary hesitancy , surgical site infection

### **MATERIAL AND METHODS**

**INCLUSION CRITERIA:** 1) Age 18 to 75 year with reducible unilateral and/ or bilateral inguinal hernia 2) Patient fit for general anaesthesia according to American association of anaesthesia grade 1 and 2

**EXCLUSION CRITERIA:** 1) History of allergy to local anaesthesia 2) Unable to come for follow up 3) Any deviation from study protocol 4) History of lower abdominal surgery 5) Recurrent hernia 6) LAP TAPP converted to open hernioplasty surgery.

### **PREPARATION**

All patients are seen and evaluated in clinic prior to surgical intervention. An in-depth history and physical examination is performed paying significant attention to any previous groin surgeries or prostatic intervention.

Both groins are inspected for inguinal hernia but no physical examination finding, an ultrasound finding is obtained to assess for occult hernias. Those with symptomatic hernias are offered laparoscopic TAPP repair.

### **OPERATIVE TECHNIQUE**

**Positioning & preparation:** All operations performed with the patient in the supine position. Skin preparation with antiseptic solution is performed, extending from superior to the umbilicus to the thigh inferiorly. the scrotum should be involved in operative field if a large hernia is present. All patients are operated in general anaesthesia and no analgesic given perioperatively except anaesthetic agent if required.

Operative steps of Laparoscopic Transabdominal Pre Peritoneal Hernia repair: All patients were subjected to general anesthesia. Pneumoperitoneum was established by carbon dioxide at 14 mmHg. A 10-mm trocar was then placed at the umbilicus. Next, one 10-mm trocar and one 5-mm trocar were inserted laterally on the right and left sides, respectively. The hernia sac was identified, and the peritoneum was incised from above the anterior superior iliac spine till the lateral leaflet of the medial umbilical ligament using a harmonic scalpel. The peritoneum flaps were then dissected upwards and downwards from the spermatic cord structures. The sac was reduced, and then the mesh (Prolene) was inserted of size 10×15 cm, taking into consideration the following aspects: to cover the region of the internal ring, the inferior epigastric vessels, and the medial compartment to guard against recurrences.

In the mesh fixation group, the mesh was fixed by spiral tacks into the Cooper's ligament, medial and lateral to the epigastric vessels with avoidance of tacks in the triangle of doom and triangle of pain. In the mesh non-fixation group, the mesh was not fixed. The peritoneum was closed by continuous absorbable sutures (vicryl 3/0). The patients were followed-up in the postoperative period for any complications such as seroma formation, mesh infection, occurrence of obstructions or adhesions, and postoperative pain.

The pain was scored according to Numeric Rating Scale where 0=no pain and 10=extremely painful. The pain is scored in the first 24 h postoperatively and after 1, 3,6, and 12 months. The duration of hospital stay and the time required to return to normal physical activity were recorded.

Analgesia in the first 24hrs - In first group injectable diclofenac 50 mg I .m stat will be given as rescue analgesia only when VAS score is more than 4. No other oral or injectable analgesia is used within first 24 hour. In second group injectable diclofenac 50 mg I .m stat will be given as rescue anaesthesia only when VAS score more than 4.

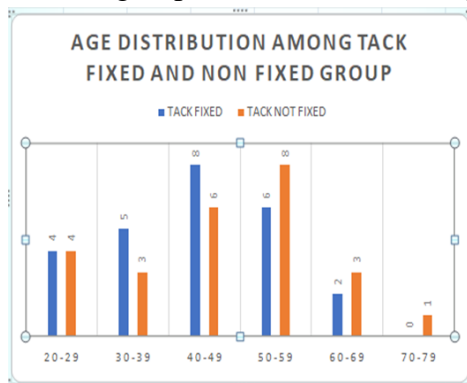
Postoperative care: Tab. Amoxicillin and clavulanic acid 625mg TDS is given by oral route for 5 days. Local examination on 1<sup>st</sup> post op day for hematoma bleeding. Discharge on first day if none of above mentioned complication are seen.

Follow up: First: 5<sup>th</sup> post op day. Second: 10<sup>th</sup> post op day for suture removal. Following point are noted on follow up -Pain by visual analogue, Infection, Abscess formation, Recurrence of hernia, Wound discharge.

This is a prospective study conducted on 50 patients of inguinal hernia treated with laparoscopic TAPP repair in District hospital of Vadodara from Feb 2020 to October 2021. All procedures are recorded. Informed consent is taken from the participants. History data collected on printed proforma. Preoperative investigation: USG B/L inguinoscrotal region. Procedure was done under general anaesthesia. Per urethral catheter was done prior to surgery, and prophylactic antibiotic was given at a time of induction. No analgesic was given at time of induction. In all 50 patients laparoscopic TAAP hernioplasty done with either mesh fixation using tack or non-fixation. Post operatively foleys catheter removed once patient become mobile and pain assessment done at 4hour 8hour 16 hour and after 24 hour. On 1<sup>st</sup> postoperative day patient put on full diet.

## RESULT

The two groups are found to be comparable with respect to age.



**Figure 1**

### Postoperative pain

In this study, postoperative pain was assessed by visual analogue score. For comparison we take 8 hr as value for post operative pain evaluation.

**At 8 hours****Table 1**

| GROUP         | Rescue analgesia required | Rescue analgesia not required |
|---------------|---------------------------|-------------------------------|
| Tack fixation | 23                        | 02                            |
| Non fixation  | 11                        | 14                            |

Chi square test at 95% confidence interval, p value is 0.0001 which is statistically significant.

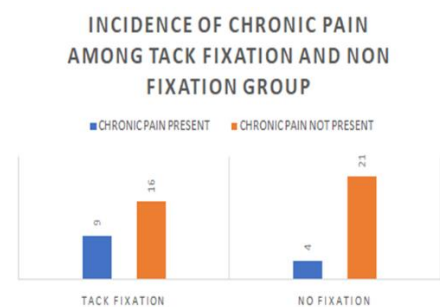
**At 16 hours****Table 2**

| GROUP         | Rescue analgesia required | Rescue analgesia not required |
|---------------|---------------------------|-------------------------------|
| Tack fixation | 15                        | 10                            |
| Non fixation  | 01                        | 24                            |

**At 24 hours****Table 3**

| GROUP         | Rescue analgesia required | Rescue analgesia not required |
|---------------|---------------------------|-------------------------------|
| Tack fixation | 05                        | 20                            |
| Non fixation  | 00                        | 25                            |

| GROUP         | PROLONGED PAIN PRESENT | PROLONGED PAIN NOT PRESENT |
|---------------|------------------------|----------------------------|
| MESH FIXATION | 9                      | 16                         |
| NON FIXATION  | 4                      | 21                         |
| <b>TOTAL</b>  | <b>13</b>              | <b>37</b>                  |

**Figure 2****Table 4: Need for rescue analgesia**

|            |                     | Rescue analgesia required | Rescue analgesia not required |
|------------|---------------------|---------------------------|-------------------------------|
| AT 8 HOUR  | Tack fixation group | 23                        | 02                            |
|            | Non-fixation group  | 11                        | 14                            |
| AT 16 HOUR | Tack fixation group | 15                        | 10                            |
|            | Non-fixation group  | 01                        | 24                            |
| AT 24 HOUR | Tack fixation group | 05                        | 20                            |
|            | Non-fixation group  | 00                        | 25                            |

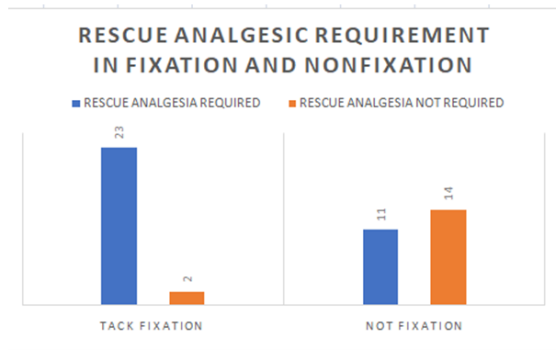


Figure 3

Table 5: Comparison of VAS Score for two different techniques

| Time after Surgery | Median VAS Score amongst Mesh fixed(IQR) | Median VAS Score amongst Mesh NOT fixed(IQR) | Mann –Whitney U Test (P-value) |
|--------------------|--|--|--------------------------------|
| 4 hours            | 3(2-3)                                   | 2(0-1)                                       | 22(p<0.0001)                   |
| 8 hours            | 6(5-6)                                   | 4(3-4)                                       | 46.50(p<0.0001)                |
| 16 hours           | 5(4-5)                                   | 2(2-3)                                       | 9.50(p<0.0001)                 |
| 24 hours           | 4(4-4)                                   | 1(1-1)                                       | 0.00 (p<0.0001)                |

Using Mann-Whitney U test, P-value < 0.0001 which is statistically significant.

## DISCUSSION

This randomized study was consisted of 50 patients treated with laparoscopic transabdominal preperitoneal hernioplasty, 25 patients were in tack fixation group and 25 patients were in non fixation group for evaluation of postoperative pain and other postoperative complication in our hospital S.S.G. Hospital, Vadodara from Feb 2020 to October 2021.

The purpose of study was to compare postoperative pain in laparoscopically TAPP in tack fixation and non-fixation and give rescue analgesia required, and to evaluate secondary complication likes femoral nerve block, urinary retention, urinary hesitancy, seroma, and surgical site infection.

Observations in our this study are summarized here;

- In our study all patients were male.
- Overall, 10 patients with direct inguinal hernia and 15 indirect hernia in mesh fixation group. and treated with TAPP hernioplasty.

Total 14 patients with direct inguinal hernia and 11 patients with indirect inguinal hernia were in non-fixation group of LAP TAPP. Of 50 patients, 28 patients were operated for right sided TAPP, 22 patients were operated for left sided TAPP.

- The comorbidities were existed in our patient's hypertension, respiratory problems, chronic obstructive lung disease.

All patients were operated under general anesthesia. Laparoscopic converted open hernioplasty cases excluded our study.

There were 24 patients in tack fixation group and 11 patients in non-fixation group required rescue analgesia at 8th hour of postoperative period.

The difference of both groups were statically significant.

The hospital stay in our study was 1 day and discharged on 2nd postoperative day. No recurrence in this study.

Laparoscopic inguinal hernia repair is being method of choice for repair of bilateral inguinal hernia repair.

Laparoscopic TAPP hernia repair is technically demanding time consuming in initial stage but once you practice more, is being technically easy and time saving and causes less postoperative pain and faster recovery with early returning to work.

During laparoscopy repair, we can not only treat the presenting hernia, but you can identify contralateral hernia and tackle it in same sitting.

## CONCLUSION

In this study of 50 patients were treated with TAPP hernioplasty, post operative pain was compared in tack fixation versus in non-fixation group.

There is no any secondary complication likes femoral nerve block, seroma formation, urinary hesitancy, urinary retention. Our study saw that non-fixation of mesh significantly reduces the post operative pain in LAP TAPP.

We concluded by this study that non-fixation of mesh can significantly reduces the post operative pain in LAP TAPP.

## LIMITATIONS

1. Small sample sized study
2. multicentre study should be conducted and large scale results should be gained for better result.
3. short duration follow up
4. As we provide free service at SSG Hospital, cost could not be evaluated.

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