ORIGINAL RESEARCH PAPER
Volume-9 | Issue-3 | March-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# LAPAROSCOPIC TRANSABDOMINAL PREPERITONEAL (TAPP) INDIRECT INGUINAL HERNIA REPAIR WITHOUT MESH FIXATION. IS MESH FIXATION NECESSARY?

General Surgery

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## ABSTRACT

**Introduction:** Reduction of chronic groin pain(CGP) in hernia surgery has become one of the major points of interest in research in the field. Of course, no new approach to reduce CGP should be at the cost of a higher recurrence rate. Omission of mesh fixation has been tried to reduce CGP. This is a retrospective study to ascertain the long-term results of this technique in terms of recurrence and chronic groin pain.

**Methods:** 79 cases of indirect inguinal hernia operated by laparoscopic transabdominal preperitoneal approach were included. Standard surgical technique was applied, wherein no form of mesh fixation was used. All cases were retrospectively evaluated for recurrence, other complications and CGP. The mean follow-up duration was 3.3 years, (range: 1-7 years)

**Results:** Of the 79 cases, none developed recurrence, other complications or moderate/severe CGP. 2 cases (2.5%) had mild CGP (VAS 2 and 3).

**Discussion:** Application of tacker or suture for mesh fixation plays a central role in many of the causes of CGP. Hence it can be inferred that chance of CGP is likely to decrease if mesh fixation is avoided. The concern of recurrence with this approach can be negated by the findings of this study and others, which suggest that recurrence rate does not increase if mesh is not fixed in laparoscopic TAPP done for indirect inguinal hernia. By Avoiding the use of a tacker, a significant reduction in cost of the materials occurs.

**Conclusion:** Based on our findings in this study, we can conclude that avoidance of mesh fixation in laparoscopic transabdominal preperitoneal hernia repair of indirect inguinal hernia does not increase the risk of recurrence, and may reduce chronic groin pain, and clearly reduces cost of the materials needed for the surgery. Hence, omission of mesh fixation can be safely tried in TAPP done for indirect inguinal hernia without an increase in the risk of recurrence.

## KEYWORDS

Inguinal hernia, laparoscopic, transabdominal pre-peritoneal, repair, mesh fixation, non-fixation, tacker, chronic groin pain, recurrence.

## 1. INTRODUCTION

Over the last century, hernia surgery techniques have come a long way from crude and ineffective to highly sophisticated and efficient. With the improvements over time, recurrence rates have come down to an acceptable level. But Chronic groin pain (CGP) remains an inadequately solved problem. [2,5]

Chronic groin pain is defined as pain that is present for more than 3 months after inguinal hernia surgery. Now, a change in this definition to "pain more than 6 months after inguinal hernia surgery" is proposed.[1]

Moderate-to-severe pain adversely affects physical activity, social interactions, employment, and productivity, and increases the need for health care utilization in these patients. Pain in this subset of patients comprises a tremendous individual and societal burden. [2]

So, at the forefront of research in hernia surgery, chronic groin pain and different approaches to reduce it are among the primary objectives. Of course, no new approach to reduce CGP should be at the cost of a higher recurrence rate.

The technique of laparoscopic transabdominal preperitoneal (TAPP) described in standard literature includes fixation of the mesh using a tacker or suture as a vital step of the surgery. [3,2,7] Use of tacker or sutures to fix the mesh in laparoscopic hernia repair is one of the major contributing factors in development of CGP. [2,8,5] As an approach to reduce CGP, omission of mesh fixation has been proposed by various studies. But with this, there is a theoretical increased risk of mesh migration and hence recurrence of hernia.[8]

In this study, mesh fixation by any means was omitted in cases of laparoscopic TAPP repair of indirect inguinal hernia. This is a retrospective study to ascertain the long-term results of this technique in terms of recurrence and chronic groin pain.

## 2. METHODS

The surgical steps in all the cases largely followed the technique described in standard literature, wherein the open technique was used for access to abdominal cavity, and the standard 3 ports were inserted. Peritoneum flap was raised in standard fashion, followed by meticulous dissection, and demonstration of all major structures and landmarks of the local anatomy. A 15 x 12 $cm^2$ mesh was used. After unrolling, positioning and spreading the mesh so that it covers at least 5 cm margin all around the defect, a detailed examination was done to ensure the mesh was properly placed, and no undue wrinkling or lifting off of the mesh was present. After confirming this, the peritoneal incision was closed using simple continuous sutures with a barbed absorbable suture material. No form of mesh fixation was used.

All the cases included in this study were operated by a single surgeon (the lead author) who has substantial experience with laparoscopic hernioplasty. The operation theatre setup, intraoperative management, perioperative care, dressing, antibiotic, and discharge practices were largely standardized in all the cases, owing to the routine adherence to standard protocols.

Cases of indirect inguinal hernia operated by the lead author using the TAPP technique in the years 2012 to 2018 were included in the study. Telephonic follow up was done. Of the 121 total cases, 79 (65%) could be contacted and interviewed telephonically, and only these 79 cases were included in this study. All patients included in the study were male, with mean age of 42.8 years (range: 19-72 years).

To determine the presence of any complication, recurrence, pain, foreign body sensation etc., specific predetermined questions were asked, including some open-ended questions. More details were asked for further lucidity, whenever needed. The patients giving any positive or ambiguous history were invited to come to the hospital for detailed evaluation. 9 cases (11%) were invited for further clarity. For all these individuals, a detailed interview, pain scoring (Visual analogue scale - VAS), and physical examination were done. The patients operated for bilateral indirect hernia were counted as 2 cases.

The mean follow-up duration was 3.3 years, (range: 1-7 years). All of the above-mentioned data collection was done in December 2019.

## 3. RESULTS

On telephonic follow up, most of the patients seemed overall satisfied with the procedure, and seemed to be answering the questions

enthusiastically, and accurately to the best of their ability.

Of the 79 cases, none reported recurrence, or any other complication. Most of the patients did not require any extended follow up postoperatively. None of the patients had to take long term pain medications, or sought further medical care from other practitioners or institutes for the operated hernia.

Of the 9 cases invited to the hospital, the detailed evaluation confirmed the telephonic findings, and gave an opportunity to assess the VAS.

No cases reported moderate or severe chronic groin pain. 2 cases (2.5%) reported mild chronic groin pain – one had a VAS of 3 at 27 months of follow up, and the other had a VAS of 2 at 29 months of follow up.

2 cases had persistent foreign body sensation – one at 2 years, and other at 4 years of surgery.

| | Number of cases | Percentage |
|---|---|---|
| Recurrence | 0 | 0% |
| Other complications | 0 | 0% |
| Chronic groin pain (mild) | 2 | 2.5% |
| Foreign body sensation | 2 | 2.5% |

## 4. DISCUSSION

The major causes of CGP include:

- Nociceptive pain (somatic) due to ligamentous or muscular trauma during dissection or because of trauma of tacker or suture.
- Neuropathic pain due to Local nerve damage or entrapment: Nerves at greater risk of entrapment in laparoscopic techniques are the genitofemoral and lateral femoral cutaneous nerves, as compared to the ilioinguinal and iliohypogastric nerves in anterior repairs.
- Visceral pain due to sympathetic plexus injury.
- Osteitis pubis due to application of tack or suture directly on the periosteum of the pubic tubercle.[2]

As evident, a high proportion of the etiological factors are directly related to fixation of the mesh with either a tacker or suture. Hence, clearly it can be inferred that avoidance of fixing the mesh altogether would eliminate majority of the causative factors, leading to a lower incidence of CGP. This is reflected in the findings of large studies done for fibrin glue fixation, a technique that avoids traumatic mesh fixation methods. These studies found a significantly lower incidence of CGP in the fibrin glue fixation group, compared to the tacker fixation group. [2,4] Based on these findings, the benefit of a significantly lower incidence of CGP, can be confidently extrapolated to our study, where no method of mesh fixation is used.

But with no mesh fixation at all, a remaining concern is the theoretical risk of mesh displacement or rolling leading to recurrence. This concern can be appeased by the results of our study, where even with relatively long follow up (mean 3.3 years), we had zero recurrences out of the seventy-nine cases included.

Another factor that should be focused on, considering the substantial burden that hernia surgery has on the health care sector, is the cost implications. The tackers used in modern hernia surgery represent a substantial portion of the cost of the materials used. Thus, not using a tacker would no doubt significantly reduce the cost of the materials used in the surgery.

Our findings concur with other recent studies in this area, which suggest that risk of recurrence does not increase when mesh fixation is not done in laparoscopic TAPP in indirect inguinal hernia. [5,6,8]

### Limitations of our study:

This was a retrospective study, without any control group.

Follow up was not done at a specific time interval from the surgery. In some cases, due to a long follow up period, some findings like perioperative complications or pain in the initial couple of years of surgery are subject to recall bias. However, it should be noted that recall bias does not apply to recurrence.

As we included only indirect hernia cases in this study, we cannot comment on the effects of this technique in direct inguinal hernia. On the contrary, some studies have found a higher recurrence rate when mesh was not fixed in large direct hernias. [6] Hence, the fellow surgeon must be warned that the implications of this study should not be applied to direct or pantaloon defect cases.

## 5. CONCLUSION

Based on our findings in this study, we can conclude that avoidance of mesh fixation in laparoscopic transabdominal preperitoneal hernia repair of indirect inguinal hernia does not increase the risk of recurrence, and may reduce chronic groin pain, and clearly reduces cost of the materials needed for the surgery. Hence, omission of mesh fixation can be safely tried in TAPP done for indirect inguinal hernia without an increase in the risk of recurrence.

### Acknowledgements

We are thankful to Dr Ketan Jhaveri and Dr Abhay Kavishvar for their valued insight and suggestions on some important aspects of this paper.

### Disclosures

The authors have no conflicts of interest to report.

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