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Study to access mesh fixation versus non-mesh fixation in trans abdominal preperitoneal meshplasty among patients attending the general surgery department with inguinal hernia, Telangana state, India

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Abstract

Introduction: A hernia is the protrusion of a viscus or part of a viscus lined by a sac through a normal or abnormal opening in the abdominal wall. Hernias are classified into 2 types based on their visibility, i.e., External hernias and internal hernias. Aim of this study is to Compare mesh fixation versus non-fixation in TAPP (Trans Abdominal Pre Peritoneal Meshplasty) in inguinal hernia.

Methodology: Hospital based non randomized prospective case control study. The study was carried out for One year and six months from January 2019 to June 2020. The present study evaluated 40 patients, who admitted with inguinal hernia and undergone TAPP in the Department of General Surgery, RVM Hospital, Siddipet district, Telangana State.

Results: Total number of patients observed in the study was 40. Among this 40, 20 patients underwent mesh fixation LIHR and 20 patients underwent non-fixation LIHR. Using Fisher exact test, p value < 0.05 (0.00196), there is significant association between non-fixation type of repair and limited operative time, significant association between non-fixation type of repair and lesser duration of hospital stay and early resumption to daily activities is also observed.

Conclusion: The risk of hernia recurrence does not increase with non-mesh fixation in TAPP laparoscopic inguinal hernia repair. In addition, a significantly shorter operation time, decreased length of hospital stay and early return to normal activity than TAPP mesh fixation LIHR.

Keywords: Hernia, TEP, TAPP, LIHR

Introduction

Inguinal hernia is protrusion of abdominal contents through the inguinal canal. Approximately 75% of abdominal wall hernias occur in the groin. The lifetime risk of inguinal hernia is 27% in men and 3% in women [1] of the inguinal hernia repairs, 90% are done in men and 10% in women. The incidences of inguinal hernias in males have a bimodal distribution, with peaks before the first year of age and after age 40. Abramson demonstrated the age dependence of inguinal hernias in 1978. Those age 25 to 34 years had a lifetime prevalence rate of 15%, whereas those age 75 years and over had a rate of 47% [2]. Approximately 70% of femoral hernia repairs are performed in women; however, inguinal hernias are five times more common than femoral hernias. The most common subtype of groin hernia in men and women is the indirect inguinal hernia [3]. Repair can be done by Open method or Laparoscopic method. Laparoscopic inguinal hernia repair has better results than open hernia repair. It turned out to be a best alternative operation in the last 15 years. Lap inguinal hernia repair 2 types: TAPP (Trans Abdominal Pre Peritoneal) LIHR, TEP (Totally Extra Peritoneal) LIHR There is lot of controversy about mesh fixation, whether it is required or not. The objectives of this study are, whether mesh fixation has got any impact on the recurrence rate or not and to compare the mesh fixation and non-mesh fixation in terms of Duration of the surgery and Post-operative pain.

Methodology

Hospital based non randomized prospective case control study. The study was carried out for One year and six months from January 2019 to June 2020. The present study evaluated 40 patients, who admitted with inguinal hernia and undergone TAPP in the Department of General Surgery, RVM Hospital, Siddipet district, Telangana State.

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Inclusion criteria: 1. All inguinal hernias planned for TAPP. 2. Age above 14 years.

Exclusion criteria: 1. Recurrent inguinal hernias. 2. Open cases 3. Chronic conditions causing inguinal hernia like COPD, Tuberculosis and abdominal tumors. Institutional ethics clearance was obtained prior to the study. Informed oral and written consent was taken from the study participants. Statistical Analysis was done by Descriptive and inferential analysis in the present study. Excel have been used to generate graphs, tables etc. Results are presented on Mean + or - SD and results presented in number (%). Association and significance assessed by P value Using Fisher exact test. SPSS Package version 22.0 was used.

Results

Total number of patients observed in the study was 40. Among this 40, 20 patients underwent mesh fixation LIHR and 20 patients underwent non-fixation LIHR.

Table 1: Age distribution and type of fixation among the study participants

| Age | Number | | Percentage (%) | |
|-------------|----------|--------------|----------------|--------------|
| | Fixation | Non-fixation | Fixation | Non-fixation |
| <20 Years | 2 | 2 | 10 | 10 |
| 21-30 Years | 8 | 4 | 40 | 20 |
| 31-40 Years | 5 | 5 | 25 | 25 |
| 41-50 Years | 3 | 6 | 15 | 30 |
| >50 Years | 2 | 3 | 10 | 15 |

The Minimum age of the study participant was 17 years and the maximum age was 56 years who underwent hernia repair in this study. Maximum number of fixation was done in the age group of 21-30 years 8 (40%) and non-fixation type was in 41-50 years 6 (30%).

Table 2: Type of inguinal hernia among the study participants

| Type of inguinal hernia | Fixation | Non-fixation | Total |
|-------------------------|----------|--------------|-------|
| Direct | 4 | 6 | 10 |
| Indirect | 16 | 14 | 30 |
| Total | 20 | 20 | 40 |

Chi square test P-value: 0.1909

There are two types of inguinal hernia direct and indirect, among the direct non-fixation was in 6 cases and the indirect type was among 14 cases. The predominance is seen among the indirect hernia which was 30 out of 40 cases observed.

Table 3: Operation time versus type of repair among the study participants

| | Fixation | Non-fixation | Total |
|----------------------------|----------|--------------|-------|
| Operative time (≤ 70 mins) | 11 | 19 | 30 |
| Operative time (> 70 mins) | 9 | 1 | 10 |
| Total | 20 | 20 | 40 |

Fisher exact test, p value <0.05 (0.00196)

Significant association was observed statistically between non-fixation type of repair and the duration of surgery was also less when compared to the fixation type.

Table 4: Hospital stay duration versus type of surgical repair among the study participants

| Stay | Fixation | Non-fixation | Total |
|-----------------------------|----------|--------------|-------|
| Duration of stay (≤ 3 days) | 13 | 16 | 29 |
| Duration of stay (> 3 days) | 7 | 4 | 11 |
| Total | 20 | 20 | 40 |

p value<0.05

Statistically Significant association between non-fixation type of repair and lesser duration of hospital stay was observed among the non-fixation type of repair.

Table 5: Post-operative pain within 24 hrs. Versus type of surgical repair

| Post-operative pain within 24 hrs. in VAS | Fixation | Non-fixation | Total |
|---|----------|--------------|-------|
| VAS ≤3 | 13 | 15 | 30 |
| VAS >3 | 7 | 5 | 10 |
| Total | 20 | 20 | 40 |

Mantel-Haenszel chi square test P-value: 0.288

Table 6: Post-operative pain in 1 week versus type of repair

| Post-operative pain in 1 week | Fixation | Non-fixation | Total |
|-------------------------------|----------|--------------|-------|
| VAS ≤1 | 12 | 18 | 30 |
| VAS >1 | 8 | 2 | 10 |
| Total | 20 | 20 | 40 |

chi square test P-value: 0.234

Table 7: Return to normal activity versus surgical repair among the study participants

| Return to normal activity (In days) | Fixation | Non-fixation | Total |
|--------------------------------------|----------|--------------|-------|
| Return to normal activity (≤ 7 days) | 13 | 19 | 32 |
| Return to normal activity (> 7 days) | 7 | 1 | 8 |
| Total | 20 | 20 | 40 |

Fisher exact test, p value <0.05 (0.0095)

Significant association between non-fixation type of repair and early return to normal activity was observed.

Discussion

Laparoscopic approach has become an alternative to open repair for inguinal hernia for many patients and surgeons. There is abundant literature that emphasizes that laparoscopic inguinal hernia repair provides excellent results. In laparoscopic hernia repair, several anchoring techniques were used since the early 1990s, such as staples, tacks, and sutures, but any mechanical anchoring add to the risk of inducing temporary or permanent pain or can even damage sensitive structures such as nerves and vessels. The need for mesh fixation to prevent recurrence of hernias following laparoscopic preperitoneal inguinal hernia repair (TAPP) is controversial. The aim of this study was to determine the effect of fixing a mesh versus no fixation on the incidence of the risk of hernia recurrence within one year. The present study consists of 40 cases. All the patients were males, with a mean age of 29.5±11.45 years (range: 15–55 years) in the mesh fixation group. In the mesh non-fixation group, the mean age was 30.2±10.65 years (range: 18–54 years). In a similar study conducted by Ahmed A. Darwish *et al.*,^[4] all the patients were males, with a mean age of 37.133±9.558 years (range: 22–55 years) in the mesh fixation group. In the mesh non-fixation group, the mean age was 38.700±9.969 years (range: 21–55 years). This indicates inguinal hernias are more common in males than females. In our study, the operative time in both the groups was compared. In the fixation group, the mean operating time was 71.8 ±7.345 min with a range of 58-86 min and in the non-fixation group, the mean operating time was 59.05±8.517 min with a range of 52-86min, P-value was 0.00196. Indicating significant difference between mesh fixation and non-fixation in terms of operative time. Amirzargar MA, *et al.*,^[5] study Operation time for mesh fixation and no fixation was 68.09 and 21.10 minutes, respectively (P<0.001). In Ahmed A. Darwish *et al* study-fixation group, the mean operative time was 74.633±10.434 min (range: 55–92 min). In non-fixation group,

the mean operative time was 72.533 ± 8.341 min (range: 55–89 min). The *P* value was 0.393 by t-test, which was statistically not significant. In our study, the mean hospital stay in the fixation group was 2.5 ± 0.847 days with a range of 1.5 to 5 days. In the non-fixation group, the average hospital stay was 1.8 ± 0.58 days with range of 1-3 days, *P*-value: 0.00719. Indicating significant decreased hospital stay associated with non-fixation. In Ahmed A. Darwish *et al.*, study-The mean hospital stay for fixation group was 1.9 ± 1.689 days and for non-fixation group 1.4 ± 0.498 days. The *P* value was 0.393. Post-operative pain was assessed at different time intervals, using visual analogue scale. The patients' pain was evaluated using Numeric Rating Scale where 0=no pain and 10=extreme pain. The ranges then were divided into mild pain (1–3), moderate pain (4–6), and severe pain (7–10). In the fixation group, mean of post-operative pain within 24hrs was 3.65 ± 1.98 , ranging from 2-9. In the non-fixation group, mean was 2.7 ± 0.86 , ranging from 2-5. *P*-value is 0.288, statistically there was no significant difference noted between two groups in terms post-operative pain within 24 hrs by assessing VAS. In the fixation group, mean of visual analog scale of post-operative pain within 24 hrs was 3.65 ± 1.98 , ranging from 2-9. In the non-fixation group, mean was 2.7 ± 0.86 , ranging from 2-5, *P*-value is 0.288, statistically there was no significant difference noted between two groups in terms post-operative pain within 24hrs by assessing VAS. In Ahmed A. Darwish *et al.*, the pain in group A fixation after 1 week was 3.567 ± 1.331 , after 1 month 2.633 ± 1.520 , The pain in group B (non-fixation) after 1 week was 0.967 ± 0.765 , after 1 month 0.4 ± 0.563 . There was a statistically significant decrease in postoperative pain and chronic pain in group B than in group A. In this study Return to normal activity in the fixation group on average was 10 ± 4.36 days, range from 6-20 days and in the non-fixation group on average was 6.7 ± 1.55 days, range from 4-10 days. *P* value was: 0.0095, indicating non-mesh fixation is associated with early return to normal activity. In Ahmed A. Darwish *et al.*, study-The patients in group a (fixation) returned to work after 7.867 ± 2.662 days and in group B (non-fixation) after 5.033 ± 1.189 days. In this study no recurrence was noted in either of the groups during follow up. Smith *et al.*,^[6] also concluded that there was no significant difference between mesh fixation and no fixation regarding the recurrence rate.

Conclusion

The risk of hernia recurrence does not increase with non-mesh fixation in TAPP laparoscopic inguinal hernia repair. In addition, it offers a significantly shorter operation time, minimal length of hospital stay and early return to normal activity than TAPP mesh fixation LIHR. It is comparable with suture mesh fixation in terms post-operative pain, post-operative complications. Therefore, based upon the results Non mesh fixation approach in TAPP may be adopted routinely and safely in LIHR.

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