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Comparative Study of Mesh Fixation versus Non Fixation in Laparoscopic Inguinal Hernia Repair (TEP/TAPP)

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Abstract: ***Background: Term hernia is derived from the Latin word sacci hernialis, which means to rupture. Hernia is an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. An Inguinal hernia repair can be done by either open or laparoscopic method with or without the use of mesh. Objective: To study the outcomes of different modes of mesh fixation and need for fixation in laparoscopic inguinal hernia repair. Material & Method: Study was conducted from June 2018 to September 2020 in the department of general surgery of SN Medical College, Agra. All adult patients with primary uncomplicated inguinal hernia were included in the study after taking prior informed consent. Total numbers of patients included were 60. Patients were divided randomly into two groups: Group A patients underwent TAPP out of which mesh was fixed in 20 patients, group B patients ubderwent TEP procedure. Conclusion: No significant difference in outcome was noted with mesh fixation against non fixation of mesh in laparoscopic approach of inguinal hernia repair.***

Keywords: Laparoscopic Inguinal Hernia Repair, TEP, TAPP, MESH

1. Introduction

Term hernia[1] is derived from the Latin word, "sacchernialis ", which means to rupture. Hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls with or without sac. An Inguinal hernia repair[2,3,4]is the most commonly performed operation by a general surgeon owing to significant lifetime incidence with various successful treatment modalities.. Herniation[5,6]has been attributed to high pressure from constipation, prostate enlargement, obesity or excessive cough due to respiratory disease. There is good evidence that hernia is a "collagen disease" with an inherited imbalance in the types of collagen[7]. Inguinal hernias are usually classified[8,9,10] as direct or indirect. They may be congenital or acquired, but this distinction is of little importance as the operative repairs of these types are similar. In a study, Ferzli[11] et al. demonstrated that laparoscopic TEP could be performed safely without fixation of the mesh.According to Garg[12] et al. conducted study to compare fixing mesh against non fixation of the mesh in TEP repair[13].

2. Materials and Method

Prospective study performed from June 2018 to September 2020 in the department of General Surgery in SN Medical College, Agra. All adult male patients with informed consent irrespective of age were included in the study and were randomly divided into two groups.

Group A comprise of patients who had undergone TAPP procedure. This group was further divided in two subgroups. Group A1 include of patients in whom mesh fixation was done and Group A2 comprise of the patients in whom the mesh was placed insitu without fixation.

Group B comprise of patients who had undergone TEP procedure.

Inclusion Criteria

- Patients with inguinal hernia
- Patients with uncomplicated hernia
- Patients with non-recurrent hernia

Exclusion Criteria

- Patients age group less than 18 years.
- Patients with complicated (obstructed, strangulated and irreducible) hernia.
- History of previous lower abdominal surgery.
- Large hernias not amenable to laparoscopic techniques
- Patients unfit for surgery.
- Patients who were reluctant to oblige for the study.

After taking informed consent, general anesthesia was given. 30 patients in group A patients were subjected to TAPP procedure out of these mesh was fixed in 20 patients while in the remaining 10 patients mesh was placed insitu without fixation. 30 patients in group B undergo TEPP procedure. The outcome was measured in the form of post OP complications. Data was analysed using Chi square method.

3. Results & Discussion

A total of 60 patients underwent laparoscopic inguinal hernia repair during the study period. Patient demographics and hernia characteristics are displayed in Table 1 & Graph 1, 2. Mean age was 57.3 years. All patients included in the study were males. 20 hernia defect (33.33%) were found on the left, 25 (41.67%) on the right, and 15 (25%) were bilateral. 24 (40%) cases were indirect defects, 16 (26.67%) had direct defects, and 20 (33.33%) had both direct and indirect component.

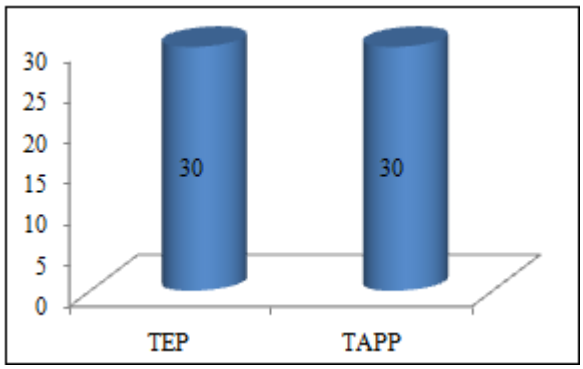
Table 1: Patient demographics and hernia characteristics

Variable	No.	%
Total Patients	60.0	
Male	60.0	
Female	0	
Mean Age (Years)	57.3	
Hernia Laterality		
• Right	25.0	41.67
• Left	20.0	33.33

• Bilateral	15.0	25.00
Hernia Defect		
• Direct	16.0	26.67
• Indirect	24.0	40.00
• Direct & Indirect	20.0	33.33

a) Type of Approach

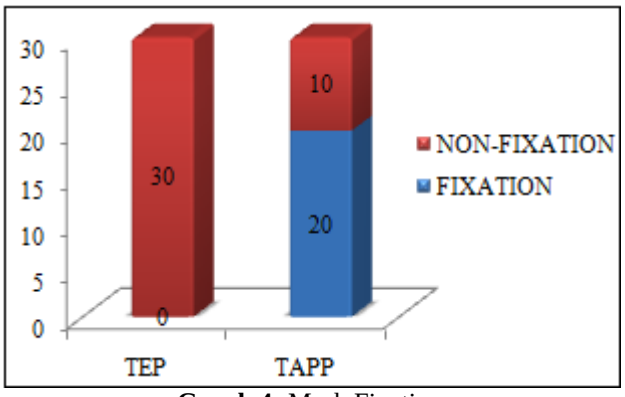
The transabdominal preperitoneal approach (TAPP) was done for 30 patients, whereas 30 patients underwent totally extraperitoneal approach (TEP).



Graph 3: Type of Approach

b) Fixation of Mesh and Duration

In our study of 60 patients who underwent laparoscopic inguinal hernia repair, 30 men underwent a transabdominal preperitoneal approach (TAPP). In the TAPP group, mesh fixation was done for 20 patients (fixation was done by tackers) while the remaining had the mesh placed in situ without fixation. Totally extraperitoneal approach (TEP) was done in 30 patients without any fixation of mesh.

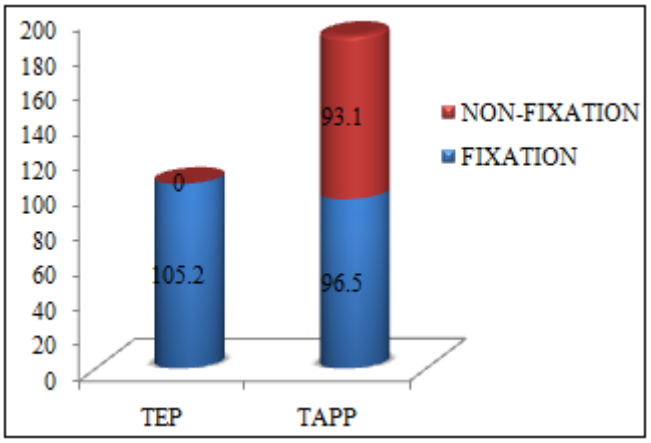


Graph 4: Mesh Fixation

Mesh fixation was performed at the level of symphysis pubis, to the Cooper's ligament on the medial aspect and the transverse abdominis on the lateral aspect. Overall, four tacks were used for fixation of mesh. The duration for mesh fixation ranged from 2.6 to 4 minutes, with a mean time of 3.3 minutes.

c) Duration of Surgery

In the TAPP group, the operating time ranged from 68 to 110 minutes. The mean operating time was 93.1 minutes in the non-fixation group and 96.5 minutes in the fixation group. Totally extraperitoneal approach (TEP) was done with the operating time ranging from 70 to 136 minutes, as the mesh was left without any fixation. The mean operating time was 105.2 minutes in the TEP group.



Graph 5: Mean Operative Time

d) Per-Operative Complications

None of the cases had major per-operative complications, including significant bleeding, injury to bowel, bladder, vessels or nerves. No re-exploration or mortalities were recorded in our study group.

e) Postoperative Complications

Post-operative complications are displayed in Table 2.

- Commonly occurring sequelae of laparoscopic inguinal hernia repair such as seroma and hematoma were observed in 3 and 1 cases respectively. None of these required drainage and resolved spontaneously.
- Only one patient who underwent TEP procedure for bilateral direct inguinal hernia developed diffuse surgical emphysema. The patient was monitored in our intensive care unit and recovered without any intervention.
- 2 patients developed a local rise in temperature, erythema and tenderness around the incision and were clinically diagnosed with surgical site infection. None required removal of the mesh.
- No patients experienced port-site herniation.

Table 2: Post operative complications

Variable	No.
Number Seroma	3
Hematoma	1
Surgical Emphysema	1
Surgical Site Infection	2

f) Post Operative Pain

Post operative pain was assessed by using a verbal rate scale (0–5) after 24hrs, 72hrs, 7days, 30days and 90days. A score of 0 represents no pain, whereas a score of 5 corresponds to the worst pain. A score of 4-5/5 was taken into account. All patients preoperative value was recorded using the same. Table 3 displays the results of pain in the two groups. Pain scores were determined to be statistically significant in the mesh fixation group on the first (0.013) and the 7th day (0.005). None of the patients experienced chronic inguinal pain on the 90th day.

Table 3: Post operative pain

Recorded on	Fixation (8)	Non-fixation (40)	P – value	Chi square
Pre operative	0	0	-	-
24hrs	7	9	0.018	7.03
7days	5	6	0.005	7.65
30days	2	1	0.042	0.64
90days	0	0	-	-

g) Duration of Post-Operative Hospital Stay

The length of hospital stay in our study group ranged from 2 - 8 days. The mean length of hospital stay was 4.39 days. The length of hospital stay was similar in fixation and non-fixation groups.

Table 4: Hospital stay

	Fixation	Non-fixation	P Value
Mean length of hospital stay (days)	5.73	4.42	0.23

h) Time to Return to Normal Activities

All patients in our study group returned to work and regular activities in less than 4 weeks. The mean time was similar in fixation and non-fixation groups.

Table 5: Time to return to normal activities

Time to return to normal activities (weeks)	Number of patients
1 week	7
2 weeks	37
3 weeks	55
4 weeks	60

	Fixation	Non-fixation	P Value
Mean time to return to normal activities (weeks)	4.3	3.3	0.052

4. Conclusion

Laparoscopic Inguinal hernia repair is an effective and safe surgical procedure. The mesh can be fixed or left in-situ to accommodate the defect. Fixation of the mesh to the abdominal wall has no difference in recurrence or increased incidence of chronic postoperative pain. No differences were found in the length of hospital stay or return to regular daily activity. For non-recurrent inguinal hernia, non-fixation of the mesh is safe and reliable.

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