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Original Research Article

Comparative study of mesh fixation versus without mesh fixation in laparoscopic inguinal hernia repair by TAPP approach

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ABSTRACT

Background: An inguinal hernia is a protrusion of abdominal contents through the inguinal canal. Laparoscopic TAPP inguinal hernia repair without mesh fixation is comparitively easy and safer than TAPP with mesh fixation with no increase in recurrence rate. Hence the current study was conducted to analyse complications after laparoscopic inguinal hernia repair (TAPP) with mesh fixation vs without mesh fixation in patients with inguinal hernia. Patients has provided informed consent for publication.
Methods: It was an observational cohort study, comparing the outcome in 60 patients undergoing laparoscopic TAPP for inguinal hernia, where patients were randomly allotted into two groups as 30 with mesh fixation and 30 without mesh fixation over a period of two years October 2020 to September 2022.
Results: In the current study, we observed that recurrence was reported among 3.33% study subjects without mesh fixation. While Recurrence reported among 6.67% study subjects with mesh fixation. However, the difference in the observations was statistically not found to be significant and there is significant reduction in postoperative pain, operation duration and hospital stay duration in laparoscopic TAPP without mesh fixation group.
Conclusions: It was observed that laparoscopic TAPP repair without mesh fixation does not increase recurrence rate but reduces operative duration, hospital stay duration and decreases the incidence of postoperative pain compared to laparoscopic TAPP with mesh fixation.

Keywords: Inguinal hernia, TAPP, Laparoscopic procedure, Recurrence, Operative time, Complications, Mesh fixation, Post-operative pain

INTRODUCTION

An inguinal hernia is a protrusion of abdominal cavity contents through the inguinal canal. Symptoms may include pain or discomfort especially with coughing exercise or bowel movements. Often it gets worse throughout the day and improves when lying down. Inguinal hernia occurs more often on the right than left side. Risk factors for the development of a hernia include: smoking, chronic obstructive pulmonary disease, obesity, pregnancy, peritoneal dialysis, collagen vascular disease, and previous open appendectomy. Hernias are partly genetic and occur more often in certain families. It is unclear if inguinal hernias are associated with heavy lifting. Hernias can often be diagnosed based on signs and symptoms. [1-4]

Inguinal hernia repair can be done by open surgery or by laparoscopic surgery. In open method, hernia can be managed by: herniotomy (in case of congenital hernia), herniorraphy and hernioplasty. Laparoscopic repair includes TAPP, TEP, and IPOM.

Laparoscopic inguinal hernia repair has many advantages over open repairs such as less post-operative pain, early return to daily activities and to work, lesser incidence of

neurogenic pain, bleeding, infection and seroma. Secondly, the inguinal and femoral areas can be inspected bilaterally, bilateral hernias can be repaired in one sitting. Several studies have shown that non fixation is a viable option without an increased risk for recurrence and that it also has the advantages of shorter operative time, less chronic groin pain, no injury to the vas deference, gonadal vessels, inferior epigastric vessels, and an overall improved quality of life when compared with tacker fixation.[5,6]

The implanted preperitoneal mesh theoretically may migrate away from the abdominal wall defect leading to recurrence of hernia. Therefore, mesh fixation is a solution to avoid this complication. However, tacks used for mesh fixation can entrap the sensory nerves with subsequent persistent pain and burning sensations in the inguinal region, the upper medial thigh, or the scrotal skin region. When these symptoms persist, they may result in severe morbidity.[7]

The aim of the study was to analyse complications after laparoscopic TAPP with mesh fixation vs without mesh fixation in patients with inguinal hernia.

METHODS

It was a Prospective cohort study carried out for a period of 2 years October 2020 to September 2022. It was a prospective cohort study on patients presenting with uncomplicated inguinal hernia to Department of General Surgery, GMERS medical college and hospital, Vadodara, Gujarat, India over a period of 2 years (October 2020 to September 2022). Total sample size of 60 patients were randomly allotted into two groups as 30 patients undergoing laparoscopic TAPP without mesh fixation and 30 patients with mesh fixation by polyglactin 2.0 suture to cooper's ligament medially, above to anterior abdominal wall.

The study groups were analysed post operatively on factors such as recurrence, post-operative pain, operative time, post-operative complications like seroma, hematoma, port site infection.

Sampling method

Purposive sampling method was used in the present study to enroll the study subjects.

Inclusion criteria

Patients with age more than 18 years, symptomatic inguinal hernia, and unilateral or bilateral inguinal hernia were included.

Exclusion criteria

Patients with complicated inguinal hernia, inguinal hernia extending to scrotum, do not give consent for study, unfit for general anaesthesia, and recurrent inguinal hernia were excluded.

Statistical analysis

The data was collected with the help of standard, semi-structured, pre-validated case record proforma.

Data were collected prospectively and coded prior to analysis using the professional statistical Package for Social Science (SPSS). The description of data was done in the form of mean±SD for quantitative data and frequency and proportion for qualitative data. Association between Quantitative variables were analysed using students-t test.

Association between qualitative (nominal/ordinal) variables were analysed using Chi square test. Results were considered significant if p value less than or equal to 0.05.

RESULTS

In the current study, we observed that Recurrence was reported among 3.33% study subjects without mesh fixation. While Recurrence reported among 6.67% study subjects with mesh fixation. However, the difference in the observations was statistically not found to be significant.

We assessed the post-operative pain among the study subjects. We observed that in the laparoscopic hernia repair with mesh fixation patients had significantly higher pain scores as compared to without mesh fixation patients.

We observed that the operative time was significantly greater among subjects with mesh fixation (91.46 min) as compared to those without mesh fixation (84.13 min).

We observed that seroma was noted among 3.33% study subjects in subjects with mesh fixation. Whereas subjects without mesh fixation did not observe any evidence of seroma formation.

We observed that hematoma was noted among 3.33% study subjects in subjects with mesh fixation. Whereas subjects without mesh fixation did not observe any evidence of hematoma formation.

In our study, we observed that port site infection was not reported among any of the study subjects in either study groups.

In the present study we observed the age distribution among the study subjects. We observed that majority of the study subjects in first group (without mesh fixation), belonged to the age group of 56 to 65 years and above 65 years (26.67%), followed by 46 to 55 years (23.33%). In second group (with mesh fixation), majority of the study subjects belonged to the age group of more than 66 years (36.67%) followed by 56 to 65 years (30%).

Table 1: Recurrence among the study subjects.

Recurrence	Without mesh fixation		With mesh fixation	
	N	%	N	%
Yes	1	3.33	2	6.67
No	29	96.67	28	93.33
Total	30	100.00	30	100.00

Note: The Chi square statistic was 0.3509. The p value was 0.553617. Not significant at p<0.05.

Table 2: Post-operative pain among the study subjects.

Duration of follow-up	Mean pain score		P value
	Without mesh fixation	With mesh fixation	
1 week	3.90	5.13	0.00
1 month	2.17	3.20	0.00
3 months	1.07	1.53	0.03
6 months	0.07	0.60	<0.0001

Note: P values are significant at 1 week, 1 month, 3 months and 6 months (p value<0.05).

Table 3: Age distribution among the study subjects.

Age distribution (years)	Without mesh fixation		With mesh fixation	
	N	%	N	%
Less than 25	1	3.33	0	0.00
26 to 35	2	6.67	2	6.67
35 to 45	4	13.33	2	6.67
45 to 55	7	23.33	6	20.00
55 to 65	8	26.67	9	30.00
More than 65	8	26.67	11	36.67

DISCUSSION

Inguinal hernia repair contributes significantly to general surgeon's workload. The issue of fixation of the hernia mesh remains unresolved in laparoscopic TAPP. Surgeons have many options to fix the mesh in laparoscopic TAPP including sutures, tacks, stapling devices and recently adhesives. Mesh fixation is usually done to prevent its migration that may lead to recurrence but many studies shows that non fixation of mesh doesn't increase the risk of hernia recurrence. Fixing the mesh not only increases the cost and duration of procedure but also can cause complications like post-operative pain. Present study comparing mesh fixation and without mesh fixation in laparoscopic TAPP approach came out with following conclusion. In the present study we assessed the presence of Recurrence among the study subjects. We observed that Recurrence was reported among 3.33% study subjects without mesh fixation. While Recurrence reported among 6.67% study subjects with mesh fixation. However, the difference in the observations was not found to be statistically significant (the Chi square statistic is 0.3509. The p value is 0.553617, not significant at p<0.05). Rekhi et al in their study observed that 2 patients had recurrence in the fixation group and none in the non-fixation group. By chi square test, p value was found to be 0.143, which is insignificant. Hence, we infer that mesh fixation doesn't reduce the chances of recurrence.[8]

Amirzargar et al in their study observed that Two recurrences occurred in the mesh fixation group versus no recurrence in the nonfixation group (p=0.096).[9] Smith et al showed in their study that stapling the mesh made no statistically significant difference to the incidence of recurrence, port-site hernia, or chronic groin pain in this study. They concluded that it is not necessary to secure an appropriately placed 10×15 cm piece of mesh during a laparoscopic TAPP inguinal hernia repair. Some authors emphasised the importance of size of the defect in this decision to fix the mesh.[10]

In the current study we assessed the mean operative time among study subjects. We observed that the operative time was significantly greater among subjects with mesh fixation (91.46 min) as compared to those without mesh fixation (84.13 min). (The t value is -9.41547. The p value is <0.00001. The result is significant at p<0.05.)

Rekhi et al in their study observed that mean operative time for mesh fixation group was 101 minutes and non-fixation group was 89.33 min. P value was analysed to be 0.006, which showed that mesh fixation significantly increases the operative time.[8] In the current study we assessed the post-operative pain among the study subjects. We observed that in the laparoscopic hernia repair with mesh fixation group had significantly higher pain scores as compared to without mesh fixation group. Pain with fixation was thought to be due to nerve irritation or entrapment with fixation devices, foreign body sensation to mesh or fibrosis in inguinal region. We managed the pain with analgesics, requirement of which was significantly more in fixation group. Similarly, at the end of 1 month, pain was observed to be significantly more in the fixation group. P value was found to be <0.05, which was statistically significant.

Rekhi et al in their study observed that observed that end of one month mean was calculated as 0.40 in mesh fixation group and 0.00 in non-fixation group. P value as 0.072.[8] Nahid et al in their study observed that Visual analogue pain scale (VAPS) given to patients were used post-operatively at 72 hours for pain assessment via telephone. Mean postoperative pain score in fixation group was 7.12±1.13 and 4.91±1.23 in non-fixation group (p<0.001).[11] Lachin et al and the present study also observed that TAPP inguinal hernioplasty without mesh fixation does not increase recurrence rate, but reduces operative duration, hospital stay duration and decreases the incidence of post-operative pain.[12] Complications like seroma, hematoma and testicular pain were seen in which

are comparable in both groups and statistically not significant.

Limitations

The confounding factors are also a possible cause of heterogeneity, as different patients may present with different size of hernias, per-morbid conditions and variable surgical risks (different ASA grade).

CONCLUSION

TAPP repaired without mesh fixation has better outcome compared to laparoscopic TAPP repair with mesh fixation in terms of reduced post-operative pain and operative-time and does not increase recurrence rate but more number of randomized trial and multi-center trial need to be undertaken to study the pros and cons of laparoscopic TAPP repair without mesh fixation in future.

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