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Original Research Article

Evaluation of recurrence and postoperative pain in laparoscopic inguinal hernia repair with mesh fixation verses without mesh fixation

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ABSTRACT

Background: Inguinal hernia affects both men and women but is much more common in men who comprise over 90% of operated patients. The purpose of this study was to determine whether elimination of tacking the mesh during endoscopic inguinal hernia repair results in decreased postoperative pain or complications, or both, without increasing the incidence of hernia recurrence.
Methods: Patients age between 18 to 70 yrs, willing for laparoscopic surgery, suitable for elective laparoscopic surgery were included in the study. TEP or TAPP endoscopic inguinal hernia repairs would be performed with the patient under general anesthesia. Data collection have done by using a structured pre-prepared case performa. The patient evaluated both by radiological and laboratory investigations both pre-operatively and post-operatively.
Results: There is no major significant difference in pain at 1 month after operation in both the group. Recurrence was higher among patient having mesh fixation and it was not statistically significant. Wound infection was occurring more among without fixation group and it was not statistically significant. Urinary retention was reported more among without fixation group and it was not statistically significant.
Conclusions: Thus, it was concluded that there is no significant difference in recurrence rate in the both study group either with fixation or without fixation. There is no significant difference in pain at one month in the both study group either with fixation or without fixation. There is more pain (visual analogue scale more than two) at three months after operation in fixation group as compared to without fixation group. There is also high cost in fixation group as compared to without fixation group.

Keywords: Laparoscopic inguinal hernia repair, Mesh fixation, Postoperative pain, Recurrence

INTRODUCTION

Inguinal hernia affects both men and women but is much more common in men who comprise over 90% of operated patients.[1] Considering both operated and non-operated inguinal hernias, the lifetime prevalence rate is 47% for men up to and including the age of 75.[2] From an aetiological point of view there are two types of inguinal hernia, congenital and acquired. An acquired inguinal hernia is generally not believed to be associated with a persistent processus vaginalis but develops in a secondary manner. Several risk factors for the development of this type of hernia have been suggested, among these various connective tissue factors. In order to compare the results of inguinal hernia repair, a standardized classification with respect to localisation and size is needed. Several classifications exist, of which the Nyhus classification is one of the most commonly used.[3]

Hernias can only be cured by surgery. The aim is to reduce the patient's symptoms and prevent possible negative events such as incarceration without causing

new problems, e.g. chronic pain or discomfort. New "tension-free" techniques were introduced, aiming to avoid tension by the use of implant mesh.[4] A further innovation was the development of a preperitoneal repair, first performed as an open repair and later employing various laparoscopic techniques.

A new persistent groin pain is reported by a significant number of patients following laparoscopic totally extraperitoneal hernia repair (TEP). Mesh fixation has been Implicated as a possible cause but is widely considered essential for mesh stabilization and early recurrence prevention.[5,6] The need for fixation of the mesh is controversial. Some have suggested that fixation of mesh during endoscopic TEP inguinal hernia repair is necessary to prevent hernia recurrence.

However, fixation of the mesh is thought to contribute to increased postoperative pain and the risk of nerve injury. Nerve injury has been estimated to occur in 2% to 4% of laparoscopic inguinal hernia repairs with the most commonly injured nerves being the femoral branch of the genitofemoral nerve and the lateral femoral cutaneous nerve.[7]

The purpose of this study was to determine whether elimination of tacking the mesh during endoscopic inguinal hernia repair results in decreased postoperative pain or complications, or both, without increasing the incidence of hernia recurrence.

METHODS

OPD of department of surgery, Surat Municipal Institute of Medical Education and Research, Surat City. The sample size has been calculated using OPEN EPI software, power 80%. Postop analgesic Use P 0.01 confidence interval is 95% using postoperative analgesic used days 2.9±5.1 in fixed mesh versus o.1±0.6 days in nonfixed mesh study model.

We have taken 108 (2n) number of cases. Patients age between 18 to 70 yrs, willing for laparoscopic surgery, suitable for elective laparoscopic surgery were included in the study. Age <16yrs with high anaesthetic risk, any medical contraindication for surgery and patients having asthma or any lung disorder were excluded in the study

TEP or TAPP endoscopic inguinal hernia repairs would be performed with the patient under general anesthesia by using a midline, 3-trocar technique.

Polypropylene mesh would be trimmed to the appropriate size to cover the entire myopectineal orifice including the hernia defect(s). The mesh would be coapted to Cooper's ligament and the anterior abdominal wall using 5 to 8 spiral tacks in patients enrolled in the tacking arm of the study (Group A). A pre-formed 15x15-cm mesh would be used without tack fixation in patients enrolled in the nontacking arm of the study (Group B).

There are two main technique for laparoscopic inguinal hernia which are commonly used now adays. Laparoscopic transabdominal preperitoneal repair in which number of considerations should be kept in mind in the performance of laparoscopic inguinal repair, whether via the totally extraperitoneal (TEP) approach or via the transabdominal preperitoneal (TAPP) approach. Extreme care must be exercised in placing the mesh fixation tacks.

This point cannot be overstated. A nerve injury caused by a tack can be truly debilitating to the patient and very challenging to treat. Tacks should be placed only above the iliopubic tract. Proper placement may be ensured by drawing a line from the pubic tubercle to the anterior superior iliac spine (ASIS) at the start of the procedure. Before firing each tack, carefully palpate the tacker head through the abdominal wall to ensure that it is above this line. Informed written consent was obtained from the patients admitted under the Department of surgery with hernia.

Data collection have done by using a structured pre-prepared case performa to enter the patient details, detailed clinical history including presenting complaints, history of trauma, past and family history, and physical examination of patients who meet the inclusion criteria. Clinically

The patient need to be evaluated both by radiological and laboratory investigations both pre-operatively and post-operatively. All patients need to be reviewed clinically and radiologically until fully healed. After getting ethical clearance certificate we will include only those patients who are admitted under surgery having inguinal hernia. Data entry was done in Microsoft Excel. Data analysis would be done by appropriate statistical tests (descriptive analysis, chi-square test) would be applied.

RESULTS

There is no major significant difference in pain at 1 month after operation in both the group. Incidence of inguinal hernia was highest in the age group of years 25-35 years, showing incidence of 25.9%. The youngest patient in this study was 18 years old and oldest was 70 years old. The mean age incidence in the present study was 43.31 years.

Pain at 3 months is more in fixation group compare to non fixation group. Pain intensity had been assessed by a visual analogue scale - VAS (0 (no pain) to 10 (worst pain). The visual analogue scale (VAS) is a subjective measure of pain. It consists of a 10cm line with two end-points representing 'no pain' and 'worst pain imaginable'. Patients are asked to rate their pain by placing a mark on the line corresponding to their current level of pain. The distance along the line from the 'no pain' marker is then measured with a ruler giving a pain score out of 10.

Table 1: Difference of pain score in with fixation and without fixation group at 1-month period.

		Fixation		Total
		With fixation	Without fixation	
Pain at 1 month	Less pain (score 1,2)	2	10	12
	More pain (score 3,4)	52	44	96
Total		54	54	108

The score can be used as a baseline assessment of pain with follow-up measures providing an indication of whether pain is reducing or not.

Table 2: Difference of pain score in with fixation and without fixation group 3-month period.

		Fixation		Total
		With fixation	Without fixation	
Pain at 3 month	less pain (score 1,2)	41	53	94
	more pain (score 3,4)	13	1	14
Total		54	54	108

Recurrence was higher among patient having mesh fixation and it was not statistically significant. Wound infection was occurring more among without fixation group and it was not statistically significant. Urinary retention was reported more among without fixation group and it was not statistically significant.

Table 3: Recurrence of inguinal hernia in fixation and without fixation group.

		Fixation		Total
		With fixation	Without fixation	
Recurrence	Yes	6	5	11
	No	48	49	97
Total		54	54	108

Seroma occurred more among the without fixation group and it was not statistically significant. The cost was higher among mesh fixation group and it was statistically significant.

Table 4: Wound infection in fixation and without fixation group.

		Fixation		Total
		With fixation	Without fixation	
Wound Infection	Yes	2	5	7
	No	52	49	101
Total		54	54	108

Patient having been operated without fixation experienced less duration of hospital stay and it was statistically significant. The chi-square statistic is 71.7037 The p-value is <0.00001. The result is significant at p <0.05 Mean pain score was higher among mesh fixation group at both 1 month and 3 month and it was found statistically significant.

Table 5: Post operative urinary retention in fixation and without fixation group.

		Fixation		Total
		With fixation	Without fixation	
Urinary retention	Yes	10	11	21
	No	44	43	87
Total		54	54	108

DISCUSSION

Inguinal hernias are the most common type of hernia. The incidence is about 25% in males and 2% in females. Inguinal hernia repair contributes significantly to general surgeon's workload.

Since the evolution of laparoscopic inguinal hernia repair, total extra-peritoneal repair (TEP) is the technique most commonly employed by laparoscopic surgeons. This technique involves placement of polypropylene mesh in the pre-peritoneal space. The issue of fixation of the mesh remains unresolved in TEP inguinal hernia repair. Surgeons have previously fixed the mesh using laparoscopic stapling devices, tacks, suturing techniques and recently adhesives.

Fixation of mesh is done to prevent migration of mesh resulting in recurrence but many studies showed without fixation of mesh is not associated with any increased risk of hernia recurrence and however fixing the mesh not only increases the cost and duration of procedure but also can cause complications like post-operative pain.[8]

We observed post-operative pain at 1 month and at 3 month. We used visual analogue scale for measurement of pain. Pain intensity had been assessed by a visual analogue scale - VAS (0 (no pain) to 10 (worst pain).

In one study, patients were observed at 6 month of follow up in which there is no significant difference in both the group after 6 month.[9] In Reddy S et al study, the postoperative pain scores are analyzed and compared by visual analogue scale at 24 hours, 1 week, and 1 month in both groups.

The median VAS score at postoperative day 1 in without fixation of mesh group was 2 compared to 4, mesh fixation group.[10] This difference was statistically significant (4 versus 2, p value <0.0001). The median vas score at 1 month interval in without fixation group was 1 compared to 3 in mesh fixation group.

In Ashwani Gupta's study, Post-operative pain and severity of pain was assessed using a visual analogue pain scale with a scale of 0 to 10.[11] A statistically significant reduction of pain scores post operatively at 24 hours (p- value =0.003), 1 week (p- value =0.007), 1 month (p- value=0.001), 3 months (p- value=0.001) and 6 months (p- value=0.007) were noted in group without fixation as comparable to with fixation group. In C. M. P. Claus & G. M. Rocha study, there is no significant difference in recurrence rate in both the group.[12] Hernia recurrence is considered as mesh displacement.[10]

In the present study none of the study groups had recurrence similar to the study conducted by Taylor C et al in which without fixation of mesh in TEP repair was not associated with an increased risk of hernia recurrence and also in the study done by Koch CA et al and Tam KW et al where there is no recurrence in any of the groups. Recurrence within 1 month is 1 (3%) in without fixation group out of 30 patients and 1 (3%)in with fixation group out of 30 patients. And after 1 month, no recurrence observed till 6 month. P value is 1 which is insignificant so there is no major difference in recurrence in both the group.

There was one recurrence in the fixated group (1/247) whilst none have yet occurred in the non fixation group.[13] One recurrence has thus far been detected after six months (0.2%). This was confirmed by laparoscopy to be a lateral recurrence associated with infolded mesh in a patient in the mesh fixation group, and re-repaired using a laparoscopic transabdominal approach (a 2 cm indirect defect had been repaired with mesh fixated by eight tacks). No recurrent hernias have yet been observed in the non fixation group. Various studies follow up after 2 years observed in which, there is no recurrence in any of the patients. So there is no increase in risk for both groups either fixation or without fixation group.[14-17]

CONCLUSION

Thus, it was concluded that there is no significant difference in recurrence rate in the both study group either with fixation or without fixation. There is no significant difference in pain at one month in the both study group either with fixation or without fixation. There is more pain (visual analogue scale more than 2) at three month after operation in fixation group as compared to without fixation group. There is also high cost in fixation group compared to without fixation group.

Duration of hospital stay in fixation group is also more (more than 3 days) compare to without fixation group in which duration of hospital stay is less than 3 day. Post-operative analgesic requirement is high (more than 2 days) in fixation group as compared to without fixation group (less than 2 days) And there is more occurrence of urinary retention, seroma formation and wound infection in without fixation group but statistically there is no significant difference in both group.

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