

Mesh fixation vs. non-fixation in total extra peritoneal mesh hernioplasty

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Abstract

Objective: To compare mesh fixation with non-fixation and its effect on outcome.

Methods: The interventional prospective study was conducted at the National Hospital & Medical Centre, Lahore from January 2007 to December 2008. After the two-year intervention period, the patients were followed up for 5 years. The selected patients were divided into two groups. In group I, mesh fixation was performed with metal non-absorbable tackers and in group II no fixation of mesh was performed. Patients were followed up at 6, 12, 24 and 60 months.

Results: Of the 63 patients in the study, 32(50.7%) were in group I and 31(49.2% in group II. The Mean pain score in group I was 4.7 ± 0.683 and 4.1 ± 0.860 in group II ($p < 0.001$). Urinary retention was more common in group I ($p > 0.05$), while recurrence was more common in group II ($p > 0.05$).

Conclusion: Pain was significantly less in the non-fixation group, while urinary retention and recurrence were not significantly increased. Non-fixation is a viable option for total extraperitoneal mesh hernioplasty and should be preferred over mesh fixation.

Keywords: Mesh fixation, Non-absorbable tackers. (JPMA 65: 270; 2015)

Introduction

Laparoscopy has opened a new horizon for surgeons. Hernia is among the commonest problems encountered in surgical care. Laparoscopic hernia repair is now recommended as the method of choice for primary inguinal hernia and recurrent inguinal hernia repair.¹ Majority of the surgeons now recommend doing total extraperitoneal (TEP) repair as it does not involve opening up of the peritoneal cavity and lesser chance of visceral injuries.² Laparoscopic hernia repair as compared to open repair requires general anaesthesia. TEP when compared to open hernia is superior in terms of reduced post-operative pain, shorter hospital stay, decreased incidence of urinary retention and earlier return to normal activities.³ Mesh can be placed without fixation or can be fixed into place with tackers.⁴ These metal tackers increase the cost and there is increased incidence of chronic groin pain.

There are several studies showing non-fixation as a viable option without increased risk of recurrence, but also has the advantages of shorter operative time, less chronic groin pain and overall improved quality of life when compared to tacker fixation.^{5,6}

The current study was planned to compare postoperative

pain and recurrence rate in fixation and non-fixation of mesh in TEP inguinal hernia repair. We hypothesised that there is no difference in postoperative pain and recurrence rate on fixation of mesh in TEP inguinal hernia repair.

Patients and Methods

The interventional prospective study was conducted at the National Hospital & Medical Centre, Lahore from January 2007 to December 2008. After the two-year intervention period, the patients were followed up for 5 years. The selected patients, who gave consent for participation and were undergoing elective TEP, were divided into two groups by lottery method into even and odd. In all group I patients, tackers were used to fix the mesh, while in group II mesh was not fixed by any means but carefully negotiated to cover hernia defect and 3cm margins distal to the defect. The patients were followed up at 0.5, 1, 2 and 5 years for any recurrence and chronic groin pain. Pain score was measured by visual analogue scale (VAS). A single surgical team performed all the operations. Patients were included in consecutive order with the diagnosis of reducible incomplete inguinal hernia between the ages of 16-70 years. Patients with large complete, obstructed and strangulated hernias or, paediatric hernias were excluded. Level of significance was 95%. Permission was obtained from the ethical review committee of National Hospital and Medical Centre, Lahore.

All patients were operated under general anaesthesia. The patients were kept in supine position, and the operating

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surgeon and camera assistant stood on the side opposite to hernia. A 12mm incision inferior to umbilicus was made. Rectus sheath was identified and opened with a small incision. After retraction of rectus, muscle space was created for a 10mm cannula. Telescope was introduced through this port. Two 5mm working ports were introduced under vision in midline at midway between umbilicus and pubic symphysis and just above pubic symphysis. Anatomy of deep inguinal ring was identified, peritoneum was reflected laterally to identify and separate inguinal canal contents. A 6x4 inch polypropylene mesh was inserted, positioned to cover hernia defect and was anchored with metallic tackers. Two staples were used to fix the mesh: one at the Cooper ligament and the other just above the anterior superior iliac spine. Three injections of first-generation cephalosporin were given in the postoperative period. The patient was discharged the next day.

Results

Of the 63 patients in the study, 32(50.7%) were in group I and 31(49.2% in group II. The mean age was 44.6 ± 16.3 years in group I, and 31.3 ± 12.5 years in group II. Patient characteristics were noted (Table-1). Mean pain score in fixation group was 4.7 ± 0.683 as compared to non-fixation group which was 4.1 ± 0.860 ($p < 0.001$).

Urinary retention was more common in group I compared to group II ($p > 0.05$) (Table-2). Only one recurrence was encountered in 5-year follow-up and that was in group II ($p > 0.05$).

Although the incidence of urinary retention was more common in group I ($n=5$) and incidence of recurrence was

more in group II ($n=1$), but both these variables were not statistically significant. Urinary retention occurred within the first 24 hours of surgery and was managed by passing a Foleys catheter which was later removed within the following 24 hours and no patient complained of any chronic urinary retention.

Discussion

In our study, mean pain score on VAS after fixation was 4.7 ± 0.683 compared to non-fixation 4.1 ± 0.86 . A randomised control trial published in 2012 showed that there was no statistically significant difference in pain.⁴ On comparing Transabdominal Preperitoneal (TAPP) versus TEP early postoperative pain is lesser in TEP hernia repair.⁷ A trial spanning over 10 years advocated use of tackers only in selective patients.⁸ One study showed that early postoperative groin pain was more common in young patients.⁹ Use of absorbable or non-absorbable tackers has no difference on pain after TEP repair.⁵ An alternative to tackers is fibrin glue which reduces postoperative pain probably due to decreased irritation and inflammation.^{10,11}

There was no statistically significant difference in recurrence rates on fixation of mesh with tackers. In cases where mesh is not fixed, re-surgery with mesh fixation is a safe and effective approach.¹² A newer self-gripping mesh is also available which forfeit the requirement for tackers.¹³ Laparoscopic TEP with mesh placement can be performed in children above age 5 years without any increased risk of recurrence.¹⁴ In experienced hands laparoscopic mesh hernioplasty is safe and has very low recurrence, but the learning curve is long.¹⁵

Urinary retention occurs in 1-2% of patients after laparoscopic inguinal hernia repair.¹⁶ In our study, urinary retention occurred in 12% to 15% patients which is much more than what has been reported in literature. This might be due to age or previous urinary problems. A non-fixed mesh may erode into urinary bladder.¹⁷

Conclusion

Pain was significantly reduced in case of non-fixation of mesh, while urinary retention and recurrence were not significantly different between the two groups.

References

1. Yang J, Tong da N, Yao J, Chen W. Laparoscopic or Lichtenstein repair for recurrent inguinal hernia: a meta-analysis of randomized controlled trials. *ANZ J Surg* 2013; 83: 312-8.
2. Kockerling F, Schug-Pass C, Jacob DA, Keller T. The intra- and postoperative complication rate of TEP in patients undergoing unilateral endoscopic inguinal hernia repair is not higher compared with TAPP. *World J Surg* 2013; 37: 933-4.
3. Zhu X, Cao H, Ma Y, Yuan A, Wu X, Miao Y, et al. Totally extraperitoneal laparoscopic hernioplasty versus open extraperitoneal approach for inguinal hernia repair: A meta-

Table-1: Patients Characteristics.

Sr. No.	Characteristic	Fixation		Non-fixation		
		No.	%	No.	%	
1	Gender	Male	28	87.5	28	90.3
		Females	4	12.5	3	9.7
2	Side of Hernia	Right	22	68.8	10	31.2
		Left	21	67.7	10	32.3
3	Type of Hernia	Direct	6	18.7	6	19.4
		Indirect	26	81.3	25	80.6

Table-2: Incidence of complication in mesh fixation and non-fixation groups.

Intervention	Fixation (n=32)		Non-fixation (n=31)		P-Value
	No.	%	No.	%	
Urinary Retention	5	15.6	4	12.9	
Hernia Recurrence	0	0	1	3.2	

- analysis of outcomes of our current knowledge. *Surgeon* 2014; 12: 94-105.
4. Sajid MS, Ladwa N, Kalra L, Hutson K, Sains P, Baig MK. A meta-analysis examining the use of tacker fixation versus no-fixation of mesh in laparoscopic inguinal hernia repair. *Int J Surg* 2012; 10: 224-31.
 5. Horisberger K, Jung MK, Zingg U, Schob O. Influence of type of mesh fixation in endoscopic totally extraperitoneal hernia repair (TEP) on long-term quality of life. *World J Surg* 2013; 37: 1249-57.
 6. Teng YJ, Pan SM, Liu YL, Yang KH, Zhang YC, Tian JH, et al. A meta-analysis of randomized controlled trials of fixation versus nonfixation of mesh in laparoscopic total extraperitoneal inguinal hernia repair. *Surgical Endosc* 2011; 25: 2849-58.
 7. Zanghi A, Di Vita M, Lo Menzo E, Castorina S, Cavallaro AS, Piccolo G, et al. Multicentric evaluation by Verbal Rate Scale and EuroQoL-5D of early and late post-operative pain after TAPP and TEP procedures with mechanical fixation for bilateral inguinal hernias. *Ann Ital Chir* 2011; 82: 437-42.
 8. Sagggar VR, Sarangi R. Laparoscopic totally extraperitoneal repair of inguinal hernia: a policy of selective mesh fixation over a 10-year period. *J Laparoendosc Adv Surg Tech A* 2008; 18: 209-12.
 9. Tolver MA, Rosenberg J, Bisgaard T. Early pain after laparoscopic inguinal hernia repair. A qualitative systematic review. *Acta anaesthesiol Scand* 2012; 56: 549-57.
 10. Khaleal F, Berney C. The role of fibrin glue in decreasing chronic pain in laparoscopic totally extraperitoneal (TEP) inguinal hernia repair: a single surgeon's experience. *ANZ J Surg* 2011; 81: 154-8.
 11. Subwongcharoen S, Ruksakul K. A randomized controlled trial of staple fixation versus N-butyl-2-cyanoacrylate fixation in laparoscopic inguinal hernia repair. *J Med Assoc Thai* 2013; 96 Suppl 3: S8-13.
 12. Ertem M, Ozben V, Gok H, Ozveri E. Relaparoscopic treatment of recurrences after previous laparoscopic inguinal hernia repair. *Minim Invasive Surg* 2013; 2013: 260131.
 13. Birk D, Hess S, Garcia-Pardo C. Low recurrence rate and low chronic pain associated with inguinal hernia repair by laparoscopic placement of Parietex ProGrip mesh: clinical outcomes of 220 hernias with mean follow-up at 23 months. *Hernia* 2013; 17: 313-20.
 14. Chen K, Xiang G, Wang H, Xiao F. Towards a near-zero recurrence rate in laparoscopic inguinal hernia repair for pediatric patients. *J Laparoendosc Adv Surg Techniq A*. 2011; 21: 445-8.
 15. Kukleta JF. Causes of recurrence in laparoscopic inguinal hernia repair. *Journal of minimal access Surg* 2006; 2: 187-91.
 16. Sivasankaran MV, Pham T, Divino CM. Incidence and risk factors for urinary retention following laparoscopic inguinal hernia repair. *Am J Surg* 2014; 207: 288-92.
 17. Hamouda A, Kennedy J, Grant N, Nigam A, Karanjia N. Mesh erosion into the urinary bladder following laparoscopic inguinal hernia repair; is this the tip of the iceberg? *Hernia* 2010; 14: 317-9.
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