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Total Extraperitoneal Repair (TEP) for Inguinal Hernia without Mesh Fixation

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ABSTRACT

Objective: To determine the outcome of TEP without mesh fixation in terms of post-operative pain, seroma formation & mesh displacement with recurrence. **Study Design:** Prospective randomized study. **Settings:** Surgical unit 4 DHQ Hospital, Faisalabad Pakistan. **Duration:** November 2015 to May 2017. **Methodology:** A total of 100 patients with age ranging from 19 to 65 years and fulfilling the criteria were included in the study. All operations were performed by the same surgeon with the patient under general anesthesia. Follow-up of patients for post-operative pain by a visual analog score (VAS) 1 to 10, sensation of foreign body and recurrence of hernia was done at 1 month, 3 months, 6 months and 1 year after surgery. **Results:** The age of the patients ranged from 19 to 65 years with mean age 42 years. All the patients were male (100%). 52 (52%) patients had right sided hernia, 35 (35%) had left sided while 13 (13%) of them had bilateral hernias. Among the left sided 1 (2.85%) was recurrent. 73 (73%) patients had indirect hernia, 24 (24%) had direct hernia while 3 (3%) patients had pantaloons hernia. The VAS for pain was between 2 and 5 on 1st postoperative day. On 1st visit, 1 (1%) patient had purulent port site discharge, he was readmitted and was managed accordingly. There were no complaints by the patients in terms of chronic pain, mesh displacement and recurrence at 2nd, 3rd and 4th follow up visits except 1 (1%) patient with displacement of mesh forming a meshoma and recurrence. **Conclusion:** Fixation of the mesh to the abdominal wall has been controversial and although many surgeons consider it necessary to fix the mesh, but it may be considered to be associated with various postoperative complications for no additional benefit in lowering recurrence rates. In non-recurrent inguinal hernia, non-fixation of the mesh is safe and reliable as proved by the study. In our study, we did not take into account the BMI of patient, the size of hernia, the type and the size of mesh. Therefore, further studies with larger sample sizes taking into account the other variables are necessary for subgroup analyses.

Keywords: Total Extraperitoneal repair (TEP), recurrence, Visual analog score (VAS).

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INTRODUCTION

In general surgical practice, the inguinal hernia is a common disease to deal with and in almost all the cases some surgical repair is needed and the results of which are mostly acceptable. Sometimes, the results are complicated by slow recovery and recurrence. The recently practiced laparoscopic procedures for inguinal hernia repair have scientifically been proved to be superior to the open procedures as far as above-mentioned problems are concerned.[1] There are two methods used for repair of inguinal hernias laparoscopically and the difference between the two is the procedure to approach to the preperitoneal space. They are laparoscopic total extraperitoneal (TEP) repair and laparoscopic transabdominal preperitoneal repair. The first ever description of Total extraperitoneal (TEP) inguinal hernia repair came from Mc Kernonand Laws in 1993. Laparoscopic inguinal hernia repair is superior to the open procedures in terms of being lesser painful, the patient returns to normal daily activities early and the incidence of neurological pain, post-operative infections, bleeding and seroma formation is also lesser. The procedures of laparoscopic inguinal hernia repair are based on the concept of stoppa's repair for inguinal hernia.[2,3]

The gold standard treatment for all type of hernia repairs in adults is mesh repair. In TEP repair done for inguinal hernia, the mesh has to be fixed with the anterior abdominal wall with some metallic devices like staple, tacks, or coils. It has been observed that these tacks or coils cause severe and sometimes chronic pain and scarring. The purpose of this study was to evaluate the outcomes of TEP repair if the mesh is not fixed to the anterior abdominal wall, in terms of post-operative pain, seroma formation, mesh displacement and recurrence.

METHODOLOGY

Study Design: Prospective interventional randomized study of elective laparoscopic extraperitoneal inguinal hernia repairs.

Settings: Surgical Unit 4, DHQ Hospital, Faisalabad Medical University, Faisalabad-Pakistan.

Duration: November 2015 to May 2017.

Inclusion Criteria: All the patients with clinical diagnosis of inguinal hernia (both primary and recurrent), above the age of 18 years.

Exclusion Criteria: Emergency cases. Patients with strangulated hernias. Patients younger than 18 years. Patients with previous open pelvic surgery. Patients not fit for general anesthesia because of comorbidities.

Methods: Informed consent was taken from all the patients, who were included in the study for the study and type of surgery. Same consultant surgeon performed all the surgeries under general anesthesia. The patients included had a post-op examination, evaluation till discharge and follow-up protocol.

Follow-up was done at the intervals of 1 month, 3 months, 6 months and 1 year after surgery. Immediate post-op examination included post-op pain records on pictorial chart with a visual analog pain score (VAS) 1 to 10. The following questions were asked on follow-up visits namely the feeling and intensity of pain, any sensation of foreign body and any recurrent swelling. All patients were physically examined by the same operating surgical team and thorough evaluation of inguinal region was made with the patient in both prone and standing positions with coughing. The following parameters were recorded in the patients, demographic data, type of hernia, postoperative complications, time taken to return to routine activities, and postoperative pain. All the patients were examined for any recurrence; in case of seromas, an ultra-sonogram was to be obtained to confirm the diagnosis of seroma formation or recurrence.

RESULTS

A total of 100 patients were included in the study. The ages of the patients ranged between 19 to 65 years with mean age 42 years. All the patients were male (100%). 52 (52%) patients had right sided hernia, 35 (35%) had left sided while 13 (13%) of them had bilateral disease. Among the left sided 1 (2.85%) was recurrent. 73 (73%) patients had indirect hernia, 24 (24%) had direct hernia while 3 (3%) patients had pantaloons hernia. The VAS for pain was between 2 and 5 on 1st postoperative day. 12 (12%) patient had VAS 2, 40 (40%) patients had VAS 3, 32 (32%) patients had VAS 4 and 16 (16%) patients had VAS 5. There were no intra-operative complications. All the patients were discharged on 2nd day postop. On 1st visit, 1 (1%) patient had purulent port site discharge, he was readmitted and was given antibiotic coverage according to culture and sensitivity report and mesh was removed when infection didn't settle. There were no complaints by the patients at 2nd, 3rd and 4th follow up visits. There was recurrence with displacement of mesh forming a meshoma in 1 (1%) patient. All the findings were recorded and analyzed and arranged in tabulated form.

Table 1: Demographic data (Age)

Total	Maximum age	Minimum age	Mean
100	65 years	19 years	42 years

Table 2: Demographic data (Sex)

Total	Male	Female
100	100 (100%)	0 (0%)

Table 3: Laterality of Hernia

Total	Right Sided	Left sided	Bilateral
100	52 (52%)	35 (35%)	13 (13%)

Table 4: Type of hernia

Total	Indirect	Direct	Pantaloons
100	73 (73%)	24 (24%)	03 (03%)

Table 5: Primary or recurrent hernia

Total	Right sided (52)		Left Sided (35)		Bilateral (13)	
100	Primary	Recurrent	Primary	Recurrent	Primary	Recurrent
	52 100%	0 0%	34 97.1%	1 2.9%	13 100%	0 0%

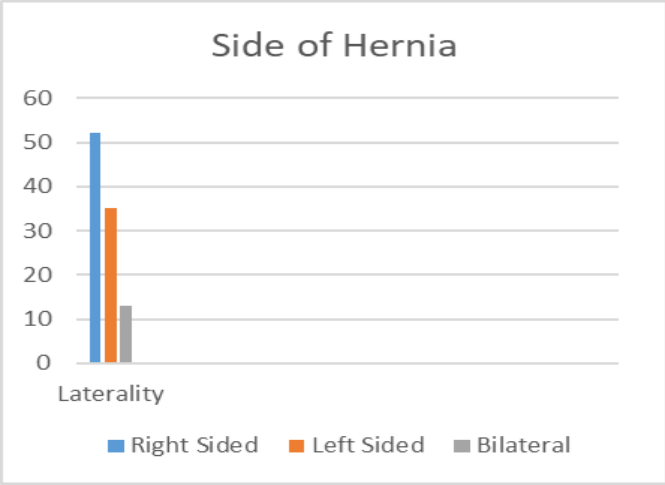

Figure 1: Side of Hernia

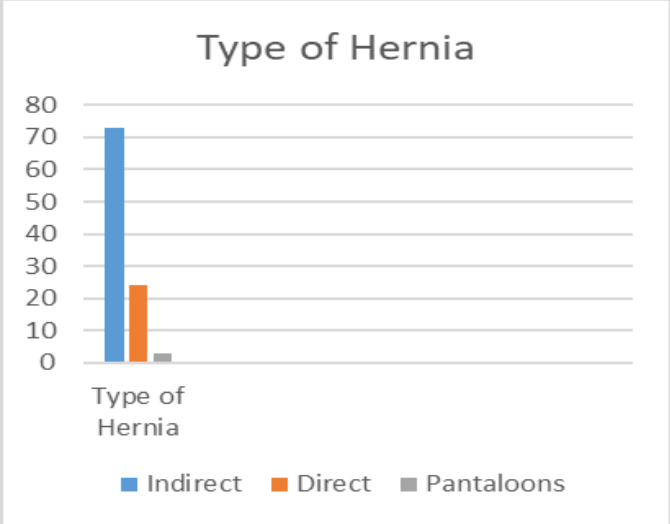

Figure 2: Type of Hernia

Table 6: Visual analog pain score (VAS) on 1st post-op day

Score	1	2	3	4	5	6	7	8	9	10
No. of patients	0	12 12%	40 40%	32 32%	16 16%	0	0	0	0	0

Table 7: Post-operative compilations

Complications	No. of patients
Seroma formation	0 (0%)
Port site infection and mesh infection	1 (1%)
Chronic pain	0 (0%)
Recurrence and displacement of mesh	1 (1%)

DISCUSSION

Our experience with single surgeon performing all TEP repairs with no fixation of meshes is satisfactory and we found it safe and effective procedure and morbidity is low and no early recurrence was found as evidenced by the work of Messaris E *et al*.[4] According to study by Gould,[5] it is still debatable that which approach is optimal for repair of inguinal hernia.

To fix the mesh, there is description of a long list of anchoring techniques namely tacks, staples, clips, coils, sutures, and glue.[6,7] Schwab JR *et al* and Winslow ER *et al*[8,9] described that when the mesh is fixed, it mostly results in increased complications both per and post-operatively like vascular and neurological injuries resulting in bleeding and increased incidence of temporary or permanent postoperative. Therefore, if the recurrence rate is not increased when the mesh is not fixed, it may be a preferred approach. There are two randomized studies showing that if the mesh is not fixed, it is not associated with increased recurrence rate and if compared with mesh fixation techniques, non-fixation reduces the rate of post-operative complications.[10]

Study by Dehal A *et al* showed that the peri-operative complications and chronic pain were lesser in their patients and no notable difference in operative time or length of hospital stay but recurrence rate was bit more.[11]

Seroma formation is early, common and discomforting complication after mesh repair. In our study, we didn't have this complication. Some studies of TEP repair with mesh fixation reported postoperative hematoma/seroma rates of 4% to 8%.[12,13,14] The result of no seroma formation in our study may be explained by no fixation of mesh and most likely due to early mobility of the patients. Garg P *et al*[15] reported that patients with mesh fixation had a significantly higher incidence of seroma and hematoma formation (9.8%) than patients without mesh fixation (1.7%) (P<.001). this can be possibly explained by irritation of peritoneum caused by metallic tacks and more collection of serous fluid.

In our study, patients reported mild to moderate pain which corresponded to a VAS score of 2 to 5 on the 1st post-operative day and pain significantly reduced afterwards. Almost all of them were freely mobile on 1st postoperative day. Studies confirm that postoperative pain is more and sometimes become chronic in case of fixation of mesh.

Koch CA *et al*[16] described that if mesh is not fixed, it reduces the necessity of post-operative narcotic analgesic. There are some contradictory studies as well. In a recent study, no clear relationship was found between surgical clips and pain, as well as mesh absorbability and chronic pain. The major postoperative complications were annoyance and discomfort (15.9%). The recurrence rate was 1.7%. Postoperative complications after TEP method of repair were mostly minor; chronic pain, to such an extent that to impair quality of life, was not experienced in the majority (89.08%). There was no major role found in satisfactory post-operative outcome of the patients of the properties of material of mesh used and the type of medicines used.[17] Beattie *et al*[18] concluded that the cause of post-operative pain when the mesh fixed in laparoscopic hernia repair is the injury of genitofemoral nerve. Ferzli *et al*[19] in contrary, state that no significant difference was found in pain incidence between fixation and non-fixation group.

In our study, we evaluated our patients til 1 year after surgery and there was 1(1%) recurrence found with mesh got rolled forming a meshoma, almost 1 year after the surgery. In general, if the recurrence occurs within six months of surgery it is due to technical failure and in many cases, recurrences following TEP occur in the first year after surgery and are always due either to mesh migration or displacement.[1]

Here comes the importance of fixation. And quantitative assessment of mesh migration or displacement causing the recurrence, if the mesh is not fixed is one of the important objectives of our study. Taylor C *et al*[10] found no recurrence in the group with no fixation of mesh as compared to 1 (0.40%) in mesh fixed group. Koch CA *et al*[15] stated that the size of hernia defect is important and if the hernia defect <3 cm, fixation is not needed to prevent the recurrence.

Some recent studies also conclude that laparoscopic TEP inguinal repair with 3-dimensional mesh without mesh fixation can be performed as safe as repair with tack fixation. TEP with no mesh fixation is safe in bilateral inguinal repairs. Early mesh displacement is minimal. This technique can be safely used in most patients with inguinal hernia.[20,21]

A unique study available in literature assesses longest follow-up of more than 5 years for the patients having inguinal hernia repair by TEP technique without mesh fixation. It also demonstrates that fixation of mesh with tacks or glue is unnecessary for TEP repair of inguinal hernia.[22]

CONCLUSION

Fixation of the mesh to the abdominal wall has been controversial and although many surgeons consider it necessary to fix the mesh, but it may be considered to be associated with various postoperative complications for no additional benefit in lowering recurrence rates. In non-recurrent inguinal hernia, non-fixation of the mesh is safe and reliable as proved by the study. In our study, we did not take into account the BMI of patient, the size of hernia, the type and the size of mesh. Therefore, further studies with larger sample sizes taking into account the other variables are necessary for subgroup analyses.

LIMITATIONS

in this study, we are handicapped of gadgets especially balloon to create preperitoneal space. Anyhow we managed the cases

with some innovations. Moreover, we managed to complete follow up in some cases on telephones.

SUGGESTIONS

TEP is technically more demanding & requires more expertise than other procedures for hernia, so lots of work &further studies should be carried out to follow the results.

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CONFLICT OF INTEREST

There is no conflict of interest involved.

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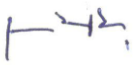
Dr. Khurram Saqib Senior Registrar, Surgical Unit IV DHQ Hospital Faisalabad Pakistan	Tabulation of Results	
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