Original Article

Onlay Mesh Repair for Abdominal Hernia; Do We Need a Paradigm Shift?

Mesh Repair for Abdominal Hernia

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ABSTRACT

Objective: This study was done to compare the two techniques in the management of ventral hernia.
Study Design: Comparative prospective study
Place and Duration of Study: This study was conducted at unit 4 of the Department of Surgery, Liaquat University of Medical & Health Sciences, Jamshoro from August 2016 January 2017.
Materials and Methods: A total of 105 patients, of both genders, aged above 13 years who were operated for VHR by onlay and sublay mesh repair, were enrolled. After randomization, Group A patients, VHR was done using onlay repair technique and in Group B, VHR was done by sublay repair technique. Data was collected on a performa and later analysed using SPSS 20.0.
Results: Mean operation time was noted as 63.46+9.7 minutes in Group A in comparison to 72.28+9.5 minutes in Group B (p value < 0.0001). Mean duration of hospital stay in Group A was 5.98+1.27 days in comparison to 6.48+1.48 in Group B (p value = 0.0659).Overall, a total of 16 (30.2%) patients experienced complications in Group A in comparison to 7 (13.5%) in Group B (p value = 0.038). Recurrence was recorded in 6 (11.3%) patients of Group A while 3 (5.8%) in Group B (p value = 0.310). Seroma was noted to be the commonest complication, noted in 13 (24.5%) patients of Group A and 5 (9.6%) in Group B (p value = 0.043).
Conclusion: Sublay mesh repair was found to be safe and effective technique for VHR in comparison to onlay mesh repair. Sublay mesh repair technique had less post operative complications. Considerentingsublay mesh repair safety and efficacy, longer operative time required can be neglected related to this technique.
Key Words: Ventral hernia, Sublay Mesh Repair, Onlay Mesh Repair

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INTRODUCTION

Ventral hernia (VH) is described as any protrusion of contents through an abnormal opening or defects in anterior abdominal wall with the exception of hernia through the inguino-femoral regions. It includes incisional hernia (80%), umbilical hernia (UH), epigastric hernia (EH), paraumbilical hernia (PUH) or Spigelian hernia (SH).[1] VHR is a commonly performed surgery around the world.[2] Various techniques have been devised to operate VH. It includes primary closure of the defect with/without application of mesh at the site of defect which is dependent on the size of the defect.[3]Suture repair related to large defects have been seen to result in high rates of recurrence (as high as 63%)[4].

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Mesh can be placed over the defect at various positions. It includes over the anterior rectus sheath (onlay mesh repair [OMR] technique), beneath the muscles of anterior abdominal wall but over the peritoneum (sublay mesh repair [SMR] technique) & from inside the peritoneal cavity (Inlay repair technique).[5]Suture repair related to large defects have been seen to result in high rates of recurrence (as high as 63%).[6] For such patients, surgical meshes are seen to minimize the rates of recurrence by 50% so considered as standard surgical care.[7]

Currently, around 1 million meshes annually are used around the world. JM East[8] described 61 cases of mesh tuck VHR, a new and simple technique employing sublay herniorrhaphy. The gold standard practice to place the mesh either onlay or sublay is yet to be established[9]. The sublay mesh hernia repair is now a days preferred by many as it reduce the recurrence rate by allowing larger pieces of prosthetic material to be used and incorporating intra- abdominal pressure to aid in keeping the mesh in place10, also mesh lies in a deeper plane so there is a less chance of post operative sepsis[11]. This study was designed to compare the outcome of sublay mesh fixation with onlay mesh repair in patients with ventral hernia at a tertiary care teaching hospital of interior Sindh.

MATERIALS AND METHODS

This comparative prospective study was done from August 2016 January 2017 at unit 4, Department of Surgery, Liaquat University of Medical & Health Sciences, Jamshoro. A sample of size of 105 was calculated by formula $n=Z^2(var)^2/(e)^2$. Patients were enrolled in the study using Non-probability, convenient sampling technique. All adult patients with primary or recurrent VHR consenting for participation were included. Patients with VHR but with any of these feature were excluded; VH cases presented in obstructed or strangulated condition. When repair is performed along with some other surgical procedure, Pregnant women, Patients with BMI>40, Patient with diagnosed intra-abdominal malignancy, patients with co-morbidities like diabetes, hypertension, IHD and patients who did not consent. All the patients were admitted from outpatient clinic. After admission, they were briefed about the diagnosis as well as the procedure to be done. Merits and demerits of both techniques of ventral hernia repair were explained. On the basis of odd or even numbers, cases were randomly allocated to 2 groups. Group A had patients whose VHR was done by OMR while in Group B, SMR was employed. Patients were discharged once diet was normally commenced and they were mobile. Skin sutures were removed on 10thpost operative day had there been no surgical site infection. Follow-up of all patients was advised at 1st, 3rd and 6th months interval .Data was recorded on a performa designed specifically for the study. SPSS version 20.0 was employed for data entry and analysis. Mean and standard deviation were calculated for age. Frequency along with percentage were noted for gender, socioeconomic status and clinical features. Stratification was done for VHR in terms of age, gender, socio economic status and clinical features. Independent sample t test was used to compare means and standard deviation of quantitative variables while chi square test was applied to qualitative variables. P value <0.05 was considered as statistically significant.

RESULTS

Mean age amongst all the patients was 46.22+12.54 years. In Group A, mean age was 45.91+13.1 years while in Group B, 46.87+12.7 years.

Out of 105 patients, there were eight (7.6%) male and 97 (92.4%) females showing a male to female ratio of 1:12.1. As shown in Table No.1, there was no difference with regards to gender distribution in between both the studied groups. Most common clinical presentations in our patients with ventral hernias were abdominal swelling, found in all the patients. Rest of the clinical presentations are elaborated in table 2.There were 65 (61.9%) patients with size of defect < 2 cm, 22 (21.0%) with 2 to 3 cm and remaining 18 (17.1%) with more than 3 cm.

In terms of frequency of various risk factors noted in our patients, constipation was observed to be the commonest, seen in 39 (37.1%), followed by obesity 19 (18.1%), anemia 11 (10.4%) smoking 8 (7.6%) and diabetes in 6 (5.7%). Benign enlargement of prostate (among male) was noted in 14 (13.3%). Mean operative time was noted to be 63.46 minutes in Group A with a standard deviation of 9.7 minutes in comparison to a mean operation time of 72.28 minutes in Group B with a standard deviation of 9.5 minutes (p value < 0.0001).

Table No.1:Gender Distribution between Patients of Both Groups

Gender	Groups		P Value
	Group-A	Group-B	
Male	3 (5.7%)	5 (9.6%)	0.445
Female	50 (94.3%)	47 (90.4%)	
Total	53	52	

Table No.2: Comparison of Clinical symptoms between two Groups

Symptoms	Groups		P Value
	Group-A (n=53)	Group-B (n=52)	
Swelling	53 (100%)	52 (100%)	-
Pain	13 (24.5%)	11 (21.2%)	0.6806
Two Irreducibility	4 (7.5%)	5 (9.6%)	0.7051
Irreducibility and obstruction	1 (1.9%)	2 (3.8%)	0.5468
Irreducibility, obstruction and strangulation	1 (1.9%)	1 (1.9%)	0.9891

Table No.3: Complications Rate Observed Between Two Groups

Complications	Groups		P Value
	Group-A	Group-B	
Overall Complications	16 (30.2%)	7 (13.5%)	0.038
Recurrence	6 (11.3%)	3 (5.8%)	0.310
Wound Infection	2 (3.8%)	1 (1.9%)	0.569
Seroma	13 (24.5%)	5 (9.6%)	0.043
Hemotoma	1 (1.9%)	1 (1.9%)	0.989

The postoperative pain was noted with the help of visual analog scale (VAS) of 1-10 (1 being least pain and 10 being worst pain). In Group A, VAS score of more than 5 was recorded among 22 (41.5%) in comparison to 23 (44.2%) (p value = 0.8447).

Mean hospital stay amongst patients of Group A was 5.98 days with standard deviation of 1.27 days while duration of hospital stay was 6.48 days in patients of

Group B with standard deviation of 1.48 (p value = 0.0659).

Overall, a total of 16 (30.2%) patients experienced complications in Group A in comparison to 7 (13.5%) in Group B (p value = 0.038). Early Recurrence within 6 months was recorded in 6 (11.3%) cases of Group A while 3 (5.8%) in Group B (p value = 0.310). (Table 3)

DISCUSSION

Small hernias <n 2.5 cm in diameter are commonly closed with success using primary tissue repair.[12-14] But, large ones accompany recurrence rates of around 30 to 40% when only tissue repair is done.[15-16] Hernia recurrence has been found to accompany distress to not only patients but also bring embarrassment to surgeons as well.

We noted a majority of our patients, 97 (92.4%) as females. An overall male to female ratio of 1:12.1 was found in our study. A local research from Rawalpindi[17] also noted that 73 (93.59%) out 78 patients were female. A recent study from India[18] also indicated that 94% of the cases undergoing VHR were females.

In the present work, the mean age in both the groups was almost similar. Dharmendra BL et al.[19]presented the similar findings in their work. Ibrahim T and Colleagues[17] found mean age was 40.95 ± 9.6 years in OMR group and 42.95 ± 8.6 years for SMR group. A local study from Lahore[20] noted mean age of 40.1±10.7 years while Bessa et al. in Egypt[21] noted mean age to be 38.2 ± 7.8 years in patients undergoing VHRs. It is also observed that late presentation among western nations is seen as findings from Shahan et al. noted that to be a mean of 57.3 years.[22]

In the present study, more dissection time required for crafting preperitoneal space could be attributed to this long duration. Achievement of satisfactory hemostasis is another load on time as stated by Raghuveer et al in their statistically significant work[16]. Very similar findings to our study were recorded by Sevinc and coworkers in 2018[23].

The duration of hospital stay after mesh repair has also been a matter of contention in the preceding years. Conflicting reports have arisen in the existing surgical literature, about the period of stay in the hospital and a tool for comparing of sublay and onlay mesh repair techniques. Jat MA et al.[13] and Leithy et al.[25] amongst other international authors have found the postoperative hospital stay to be lower in the sublay group than in the onlay group. However, Godara et al.[25] claim the contrary, with the duration of hospital stay, in their study being 6.8±1.5 days for the sublay group and 4.6±1.30 for the onlay group.

Wound complications are a common problem in ventral hernia prosthetic repair. Some authors designate these complications' development to be more after onlay techniques compared to the retromuscular method.[19] Existing literature also has deliberations which do not indicate any significant difference. Seroma and wound infection are the main problems encountered after mesh repair of ventral hernias. According to several scientific publications, seroma is a more frequent complication of onlay technique than in the retromuscular method. More frequent development of seroma in onlay mesh repair may be attributed to two reasons: increased dissection of subcutaneous tissue during surgery and tight contact of foreign body (mesh) to the subcutaneous tissue.[19] Ibrahim T et al. observed a statistically proven difference of sublay mesh repair over onlay repair with reference to surgical site infection (p=0.032). The same study noted that most common complication observed was seroma formation in (14.10%). Simultaneously, the difference for seroma formation was statistically significant (p=0.023), very similar to what we found.

Early recurrence was recorded in 6 (11.3%) Group A patients while 3 (5.8%) in Group B. The difference in terms of recurrence rate between both the study groups was found to be statistically insignificant (p-value = 0.310). Raghuveer MN et al.[16] on two years follow up, noted that recurrence rate was found to be 4.35% in sublay group, whereas it was found to be 8.51% in OMR group.

CONCLUSION

Even though operating time is longerbut low complications such as wound sepsis and seroma formation, with ultimately better patient's satisfaction makes sublay mesh repair getting more acceptance worldwide.

Author's Contribution:

Concept & Design of Study:	Musarrat Nazeer Sandano
Drafting:	Altaf Ahmed Talpur, Fazila Hashmi
Data Analysis:	Riaz Akhtar, Iqra Khanzada, Syed Amir Shah
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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