

VENTRAL INCISIONAL HERNIAS; MESH VERSUS NON-MESH REPAIR, ELEVEN YEARS EXPERIENCE AT SHAIKH ZAYED HOSPITAL, LAHORE

DR. HAROON JAVAID MAJID, FRCSEd

Associate Professor
Department of Surgery
Shaikh Zayed Hospital & Federal PGMI
Lahore, Pakistan

DR. MUHAMMAD SHAFI, MS (Surgery)

Assistant Professor
Department of Surgery
Shaikh Zayed Hospital & Federal PGMI
Lahore, Pakistan

DR. HARUN MAJID DAR, FCPS

Associate Professor
Department of Surgery
Shaikh Zayed Hospital & Federal PGMI
Lahore, Pakistan

Dr. Muhammad Arif Javed, FCPS

Senior Registrar
Department of Surgery
Shaikh Zayed Hospital & Federal PGMI
Lahore, Pakistan

ABSTRACT: Ventral Incisional Hernias are a well known complication after abdominal surgery with a reported incidence of 10% - 20% and a recurrence rate of 30% - 50% after open suture repair and less than 10% after open mesh repair. **Objectives:** To compare the outcome of two different methods of open repair of VIH (i.e. Mesh versus Non-mesh or Suture Repair in terms of morbidity, complications and recurrence. **Period:** 11 years period (January 2000 – December 2010). **Setting:** Shaikh Zayed Hospital, Lahore. **Patients & Methods:** The total number of patients who underwent surgery for repair of VIH during the study period was 321. There were only 33 patients in Group A (simple suture/Keel repair) while Group B had 288 patients. The most common early postoperative complications seen in both the groups were wound seroma and infection. Post-operative respiratory insufficiency was more common in the obese. Chronic pain and feeling of foreign body was more frequently seen in the mesh group. On the other hand, recurrence rates were far greater in the suture repair group. The overall mortality in the whole series was 3 patients (0.93%). **Conclusions:** The rates of ventral incisional hernia recurrence and complications are significantly lower after open onlay mesh repair as compared to the open suture repair. However, these results require confirmation by prospective randomized clinical trials which should also include the results of laparoscopic ventral incisional hernia repair which is a new and emerging technique in Pakistan.

Key words: Incisional hernia, Mesh, Recurrence

INTRODUCTION

Ventral Incisional Hernias (VIH) are a well known complication after abdominal surgery and the incidence after laparotomy reported in literature ranges from 10% to 20%^{1,2}.

Wound infection alone after abdominal surgery increases the risk of VIH to 30%³. Other postulated predisposing factors are obesity, diabetes mellitus, steroids, smoking and sub-optimal surgical technique⁴.

The reported recurrence rate after simple open repair of VIH without the use of a mesh / prosthesis is between 30% to 50%^{1,2}. The use of a synthetic mesh to repair these hernias by various described techniques reduces the recurrence rate to 10% or less^{1,5}.

AIMS OF THE STUDY

The aim of our study was to compare the outcome of two different methods of open repair of VIH (i.e. Mesh versus

Non-mesh or Suture Repair) and to evaluate the morbidity in terms of the complications and recurrence rate associated with these operations in a consecutive series of patients. This study was conducted to review our techniques and management protocols with a view to improve our results in the future.

PATIENTS AND METHODS

A critical review and analysis of the complete medical and follow-up records of all consecutive patients who underwent open repair of VIHs in our unit either by the suture repair technique or the onlay mesh technique over an 11 years period (January 2000 – December 2010).

Patients were divided into two groups (Groups A and B). Group A included all the patients who were operated on by using the conventional open suture repair technique (Keel Repair) that basically involved hernia repair under varying degrees of tension with continuous or interrupted

(or combinations of both) suture of monofilament non-absorbable material (Prolene No.1). In some of the earlier cases, simple repairs were also carried out with interrupted sutures of braided black Nylon (Nurolon No.1, Ethicon, Johnson & Johnson). During this operation, the hernia sac was dissected and excised, and the abdominal wall defect was closed with nonabsorbable, interrupted or continuous suture as the first layer of the repair. Hernioplasty with a second layer of nonabsorbable continuous sutures was performed to invaginate the first layer of sutures. This suture technique was repeated until the medial borders of both the rectus muscles were 1 cm or less apart. Closed suction drainage (One or two Redivac Closed Suction drains) was employed in all the cases. Subcutaneous layer was approximated using interrupted stitches of fine absorbable suture (Vicryl 3/0). Skin was closed with simple interrupted mattress sutures of prolene 3/0 or with with metal clips in the majority of cases. Sub-cuticular skin closure was performed in a few cases.

Group B patients were operated using the open onlay mesh repair technique (Figures 1-3). The sizes of the mesh used were variable and depended on the size of the defect. These hernias were repaired using polypropylene (Prolene) meshes, which were fixed with interrupted sutures on the rectus muscle aponeurosis. After incision and raising the skin and sub-cutaneous tissue flaps, the hernia sac was excised as in Group A patients and the abdominal wall defect was closed with nonabsorbable, continuous suture. The mesh was fixed with nonabsorbable, interrupted sutures. Subcutaneous area over the mesh was drained with one or two closed suction drains in all the patients in this group also. Closure of the subcutaneous tissues and skin was similar to that described for Group A.

The operations were performed by all grades of surgeons which included Consultants, Senior Registrars and Registrars along with Senior Residents supervised by a consultant or a Senior Registrar. General anaesthesia was employed in all the patients. All patients were also investigated and examined by physicians and anaesthetists for fitness prior to surgery. Special attention was paid to cardiopulmonary testing and fitness.

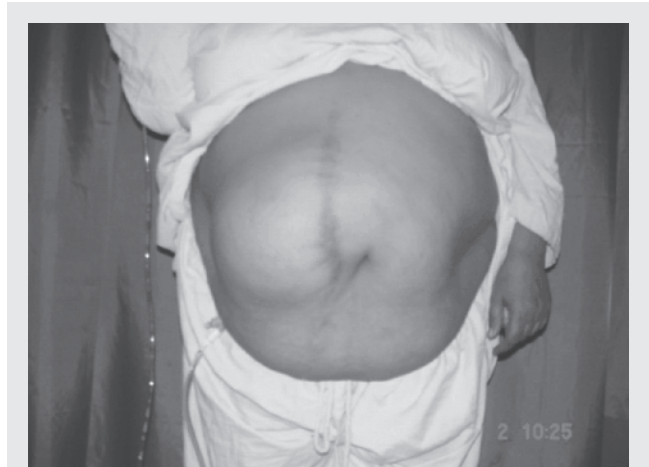


Fig-1. Large Ventral Incisional Hernia through a right paramedian laparotomy scar.



Fig-2. The excised panniculus along with sacrifice of the umbilicus.

The operative and postoperative complications, duration of surgery, duration hospital stay and quality of life following surgery were all noted. Postoperative evaluation included pain and discomfort in the abdomen, recovery time to normal physical activity, and hernia recurrence rate. Hernia recurrence was diagnosed during the follow-up period. The average follow-up period was 18 months (Range 2 weeks to 4 years and 6 months) after discharge from the hospital.



Fig-3. Prolene onlay mesh.

RESULTS

The total number of patients who underwent surgery for repair of VIH during the study period was 321. There were 129 females and 192 males. The average age was 46 years (range 18 years to 92 years).

There were only 33 patients in Group A (simple suture/Keel repair) while Group B had 288 patients. Therefore, 89.71% of the patients underwent the onlay mesh repair for their hernias. Table I shows the number of patients that had additional procedures along with repair of hernia. The commonest additional procedure carried out along with the hernia repair was cholecystectomy (41 patients i.e. 12.77%).

The mean operating time for Group A patients was 1 hour and 5 minutes (range 35 minutes to 2 hours and 22 minutes) and that for Group B patients was 1 hour and 20 minutes (range 50 minutes to 3 hours and 45 minutes). Longer period of operative time was observed in Group B patients, in patients who had additional procedures and in operations where the surgery was performed by a senior resident under consultant supervision. Longer operative time was also noticed in operations which involved the removal of a larger panniculus of subcutaneous fat and skin.

The immediate and late postoperative complications are summarized in Table II. The commonest early postoperative complications seen in both the groups were wound seroma and infection. Most of the patients

Table-I. Additional procedures.		
Additional procedures	Group A (n=33)	Group B (n=288)
Cholecystectomy	4 (12.12%)	37 (12.84%)
Bilateral tubal ligation	3 (09.09%)	19 (6.59%)
Appendicectomy	01 (03.03%)	-
Cholecystectomy and bile duct exploration	-	01 (0.34%)
Stoma reversal	01 (03.03%)	05 (1.73%)

with seroma in both the groups (n=58) responded well to aspiration and antibiotics while only 5 became secondarily infected and required the removal of a few stitches for adequate drainage. All the patients with wound infection (n=54) recovered after removal of the appropriate stitches for drainage, daily dressing and the judicious use of antibiotics. Only 2 patients from Group B required the subsequent removal of mesh on account of continuing infection. Culture based antibiotics were used in 84% of the patients with wound infection. Deep Vein Thrombosis and Pulmonary Embolism was seen in a few patients. All these patients were obese females with prolonged surgery i.e. over 3 hours. Postoperative respiratory complications were seen more in Group A patients and may relate to more tension in the simple suture repairs. Also, post-operative respiratory insufficiency was more common in the obese. Chronic pain and feeling of foreign body was more frequently seen in the mesh group. On the other hand, recurrence rates were far greater in the suture repair group.

Iatrogenic bowel injuries included one patient with injury to the cecum, another one with injury to the transverse colon and 2 patients with iatrogenic injury to the small bowel. All iatrogenic bowel injuries were a result of difficult dissection for adhesiolysis in the presence of massive adhesions because of previous abdominal surgery.

The mean hospital stay of Group A patients was 8 days (range 4 to 19 days) while that of Group B patients 11

Table-II. Immediate & late complications

Postoperative complications	Group A (Suture repair) n=33	Group B (Onlay mesh repair) n=288
Wound seroma	07 (21.21%)	51 (17.7%)
Wound infection	05 (15.15%)	49 (17.01%)
Wound haematoma	02 (06.06%)	05 (1.73%)
Iatrogenic bowel injury	01 (03.03%)	03 (1.04%)
Deep vein thrombosis	-	05 (1.73%)
Pulmonary embolism	-	03 (1.04%)
Postoperative respiratory insufficiency	07 (21.21%)	19 (06.59%)
Postoperative pneumonia	02 (06.06%)	09 (3.12%)
Chronic pain	03 (09.09%)	33 (11.45%)
Recurrence	13 (39.39%)	11 (3.81%)

days (range 7 to 26 days).

The overall mortality in the whole series was 3 patients (0.93%). One patient from Group B died due to thromboembolism while another two (one from each group) died because of post-operative respiratory complications.

DISCUSSION

The reported incidence rates of Ventral Incisional Hernia (VIH) after abdominal surgery are approximately 3% and 15% after laparoscopic and open surgery, respectively⁶. These are associated with a reduced quality of life and high socioeconomic costs⁷.

The treatment of VIH has changed drastically over the last twenty years. However there is still some controversy concerning the type of mesh to be used, mesh positioning and operation method^{8,9}. Laparoscopic repair is an increasingly preferred alternative to open surgery at many centers all over the world¹⁰. Although we have performed a few incisional hernia repairs laparoscopically at our institute recently, we have not

included any of these cases in this study.

Although some authors did not find differences in the hospitalization time between these Groups^{11,12}, the duration of hospital stay in our retrospective series was longer in the patients who underwent onlay mesh repair. This may be explained by the greater tissue reaction generated by the mesh leading to production of tissue fluid in the suction drains for a longer period of time. Majority of our patients were discharged only after the removal of the suction drains, thus leading to a longer hospitalization time in the mesh repair patients.

Some workers have reported a higher rate of wound infection, seroma and fistula formation after open mesh repair¹¹. Other studies did not find differences between these two groups^{11,12}. In our study, the frequency of wound seroma was slightly more in the suture repair group (Group A 21.21% vs. Group B 17.7%) and wound infection was higher in the open mesh repair group (Group A 15.15% vs. Group B 17.01%).

The rate of post-operative respiratory complications was higher in the suture repair group among our patients and was also the cause of death in one of them. As opposed to mesh repair which is a tension free repair, in open suture repair, the tissues are likely to be under tension. This leads to increased intra-abdominal pressure and postoperative hypoventilation, complicated with respiratory insufficiency and/or pneumonia¹³.

Table-III. Comparison of recurrence rates

Series	Open suture repair	Open mesh repair
Luijendijk et al	46%	23%
Clark	38%	25%
Koller et al	63%	13%
Our series	39.39%	3.81%

Table III shows our recurrence rates in comparison to the results of other authors¹⁴. Our results are similar to the results of these workers. The recurrence rate in the onlay mesh repair group was far less than the simple repair group. Although our retrospective data on the causes of

recurrence in our series of patients is deficient, it was observed that wound infection and obesity were the strongest associated factors to which hernia recurrence may be attributable. The patients' age or gender had apparently no influence on the recurrence rate^{12,15}.

CONCLUSIONS

The rates of ventral incisional hernia recurrence and complications are significantly lower after open onlay mesh repair as compared to the open suture repair. However, these results require confirmation by prospective randomized clinical trials which should also include the results of laparoscopic ventral incisional hernia repair which is a new and emerging technique in Pakistan.

Copyright© 15 May, 2011.

REFERENCES

1. Frantzides CT, Carlson MA, Zagrofikis JG, Madan AK, Moore RE. **Minimally invasive incisional herniorrhaphy**. Surg Endosc 2004;18:1488-91.
2. Bower CE, Reade CC, Kirby LW, Roth JS. **Complications of laparoscopic incisional-ventral hernia repair**. Surg Endosc 2004;18:672-5
3. Anthony T, Bergen PC, Kim LT, Henderson M, Fahey T, Rege RV, et al. **Factors affecting recurrence following incisional herniorrhaphy**. World J Surg 2000;24:95-101.
4. AM Malik, A Jawaid, AH Talpur, AA Laghari, A Khan. **Mesh Versus Non-mesh Repair of Ventral Abdominal Hernias**. J Ayub Med Coll Abbottabad 2008;20(3)
5. Goodney PP, Birkmeyer CM, Birkmeyer JD. **Short-term outcomes of laparoscopic and open ventral hernia repair**. Arch Surg 2002;137:1161-5.
6. Andersen L, Klein M, Gögenür I, Rosenberg J: **Incisional hernia after open versus laparoscopic sigmoid resection**. Surg Endosc 2008, 22:2026-2029.
7. Yahchouchy-Chouillard E, Aura T, Picone O, Etienne J-C, Fingerhut A: **Incisional hernias**. Dig Surg 2003, 20:3-9.
8. Eriksen JR, Gögenür , Rosenberg J: **Choice of mesh for laparoscopic ventral hernia repair**. Hernia 2007, 11:481-492.
9. Korenkov M, Sauerland S, Arndt M, Neugebauer EAM, Troidl H: **Randomized clinical trial of suture repair, polypropylene mesh or autodermal hernioplasty for incisional hernia**. Br J Surg 2002, 89:50-56.
10. Müller-Riemenschneider F, Roll S, Friedrich M, Zieren J, Reinhold T, Graf von der Schulenburg M, Greiner W, Willich SN: **Medical effectiveness and safety of conventional compared to laparoscopic incisional hernia repair: A systematic review**. Surg Endosc 2007, 21:2127-2136.
11. Paul A, Korenkov M, Peters S, Kohler L, Fischer S, Troidl H. **Unacceptable results of the Mayo procedure for repair of abdominal incisional hernias**. Eur J Surg 1998;164:361-7.
12. Luijendijk RW, Lemmen MHM, Hop WCJ, Wereldsma JCJ. **Incisional hernia recurrence following "vest-over-pants" or vertical Mayo repair of primary hernias of the midline**. World J Surg 1997;21:62-6.
13. Hadad I, Small W, Dumanian GA. **Repair of massive ventral hernias with the separation of parts technique: reversal of the 'lost domain'**. Am Surg. 2009 Apr;75(4):301-6.
14. Cassar K, Munro A. **Surgical treatment of incisional hernia**. Br J Surg 2002;89:534-45.
15. Carbajo MA, Martin del Olmo JC, Blanco JI, de la Cuesta C, Toledano M, Martin F, et al. **Laparoscopic treatment vs. open surgery in the solution of major incisional and abdominal wall hernias with mesh**. Surg Endosc 1999;13:250-2.

Article received on: 27/04/2011

Accepted for Publication: 15/05/2011

Received after proof reading: 16/05/2011

Correspondence Address:

Dr. Haroon Javid Majid, FRCSEd,
Associate Professor,
Department of Surgery,
Shaikh Zayed Hospital
and Federal Postgraduate Medical Institute,
Lahore, Pakistan.
hjmajid@gmail.com

Article Citation:

Majid HJ, Dar HM, Shafi M, Javed MA. Mesh versus non-mesh repair of ventral incisional hernias - eleven years experience at Shaikh Zayed Hospital, Lahore. Professional Med J Apr-Jun 2011;18(2): 228-232.