Original Article

Surgery

Effect of Obesity on Outcome of Ventral Hernia Mesh Repair

1. Bushra Shaikh 2. Saima Athar Shaikh 3. Azhar Ali Shah 4. Khush Mohammad Sohu 5. Shahid Hussain Soomro

1. Consultant Surgeon, Surgical Unit-III, CHCH, Larkana 2. Asstt. Prof. Surgical Unit-III, CHCH, Larkana
3. Asstt. Prof. of Surgery, GMMM, Sukkur 4. Asstt. Prof. of Surgery, GMMM, Sukkur
5. Asstt. Prof. Surgical Unit-II, CHCH, Larkana

ABSTRACT

Objective: To determine the effect of obesity on outcome of ventral hernia mesh repair.

Study Design: It was a descriptive case series study

Duration and Setting: This study was conducted at Surgical Units II & III, Chandka Medical College Hospital Larkana and Department of Surgery, Ghulam Muhammad Maher Medical College Hospital Sukkur from 01st November 2009 to 31th October 2011.

Patients and Methods: A total of 113 patients of different age groups and both genders having different types of ventral herniae were included in the study. Body mass index (BMI) of all patients was recorded along with their demographic details to see its impact on outcome. Polypropylene mesh repair was performed using sublay technique under general anesthesia. Postoperatively patients were followed up for a period of one year for complications including seroma, haematoma, superficial wound infection, mesh infection and recurrence.

Data analysis was carried out by using SPSS version 17.

Results: Mean age was 50.26 years with female to male ratio of 4.8:1. Most common type of hernia remained Incisional (48.7%) followed by paraumbilical (31.0%), epigastric (11.5%) and umbilical (8.8%). BMI ranged from 23 to 43 with mean BMI of 28. 4 patients were morbidly obese. In 89.4% patients, there was single hernial defect and in 76% defect was < 4 cms. Mean operative time remained 67.093 minutes with average postoperative hospital stay of 4.8 days. Postoperatively 72.56% of patients recovered uneventfully. Most common complication was seroma (10.6%) followed by superficial wound infection (7%), mesh infection (4.4%), hematoma (2.65%) and recurrence (2.65%). Majority of patients who developed complications had BMI >30, majority of complications occurred in grade-I & II obesity group (79.8%).

Conclusion: Obesity has a negative impact on outcome of ventral hernia mesh repair, therefore preoperative weight reduction is recommended in order to avoid complications.

Key Words: Ventral Hernia, Obesity, Mesh Repair, Wound infection, Recurrence.

INTRODUCTION

Ventral herniae occur through defects in the midline or in lateral abdominal wall and include Epigastric, Umbilical, Paraumbilical, Incisional and rare Spigelian hernia[1]. A hernia results when muscle weakness team up with strain in the form of chronic cough, constipation, heavy weight lifting or pregnancy. There are different predisposing factors for muscle weakness including smoking, malnutrition, obesity, acquired collagen deficiency and previous surgical scar etc[2]. In general all herniae should be repaired unless local or systemic condition of the patient precludes a safe outcome or when hernia is too small or wide necked to pose any danger[3].

There are different techniques of surgical repair of ventral hernia: Primary herniorrhaphy (anatomical repair, Mayo's repair etc), Prosthetic mesh repair & Autogenous repair by vascularized innervated muscle flaps[4]. The tension free method preferred by most of the surgeons nowadays is placement of prosthetic mesh at the site of hernia. Prosthetic mesh has revolutionized the treatment of all herniae[5]. This method creates little or no tension and has lower recurrence rate as well as faster recovery with minimal pain[6].

Despite many advantages, clinicians have been challenged by an increasing variety of novel non-infectious & infectious complications following the widespread use of mesh after open or laparoscopic hernia repair. These complications include Seroma (9.6-26.2%), Hematoma (4.5%), Superficial wound infection (9.8-33%), Mesh infection (1.6-8.2%) & Recurrence (3-8.2%).[7, 8, 9, 10]

A number of risk factors which predispose to such complications have been identified and these include local risk factors such as number of hernial defects, size of the defect, operative time & systemic risk factors like obesity, immunosuppression, steroid use and diabetes mellitus.[11, 12] Because of multiple reasons, obesity has a negative impact on outcome of hernia repair with obese patients developing more wound related complications than non-obese population. We have performed this analysis to see the effect of obesity on outcome of ventral hernia meshplasty in our setup.

PATIENTS AND METHODS

This study included all the patients fulfilling inclusion criteria admitted via OPD in the Department of Surgery (units II & III) Chandka Medical College Teaching Hospital, Larkana & Department of Surgery Ghulam Muhammad Mahar Medical College Sukkur, both being the constituent medical colleges of Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU) Larkana. The patients were evaluated clinically in OPD & risk factors sorted out. The purpose and procedure of the study was explained to the patients and informed consent was obtained to participate as study subjects. Patients were enrolled during first 12 months of study. Along with other demographic details, BMI of all patients was recorded to see its impact on outcome.

Inclusion criteria: All patients of either sex, age & BMI having ventral hernia (diagnosed clinically) & who underwent prosthetic mesh repair in an elective setting, were included in the study.

Exclusion criteria: Patients having obstructed or strangulated hernia who underwent an emergency operation were excluded from the study**.** Patients with co-morbid conditions like diabetes, jaundice, cirrhosis, severe malnutrition, major cardiac, respiratory, renal dysfunction or recurrence cases were also excluded.

All the data was recorded on especially design proforma for the study. Prophylactic antibiotic (1st generation cephalosporin 1 gm I/V) was given at the time of induction & continued for 48 hours postoperatively. Polypropylene mesh repair was performed using sublay technique under G.A. In all patients negative suction drain was placed, which was removed when drain output reduced to < 20 ml/day.

Postoperatively, the patients were followed up for the period of one year, where patients were observed for complications of mesh repair including recurrence for this the contact numbers of patients were maintained. Data was analyzed on SPSS version 17. Mean +/- SD was calculated for age of the patients, Body Mass Index, operative time, postoperative hospital stay and size of the defect. Frequency was calculated for gender, type of ventral hernia & for complications.

RESULTS

A total of 113 patients underwent sublay mesh repair for various types of ventral herniae during initial 12 months of a two year study period. The youngest patient was 24 years old and the oldest was 75 years with mean age of 50.26 years. Incidence of ventral hernia was highest in 4th and 5th decade of life. Out of 113 patients, 94 (83%) were females which outnumbered the 19 male patients (17%). The female to male ratio was 4.8:1 showing that the incidence of ventral hernia is higher in females.

Most common variety was observed to be incisional hernia in 55 patients (48.7%) followed by paraumbilical hernia in 35 (31%), epigastric hernia in 13 (11.5%), umbilical hernia in 10 (8.8%). Spigelian hernia was not seen in any patient. All incisional herniae were through midline scar and majority through lower midline or lower part of midline scar. Nature of previous surgeries was Caesarean section, hysterectomy and laparotomy for appendix or gut perforations but the record of previous operations were not available with majority of the patients.

Body mass index (BMI) of every patient was recorded, it ranged from 23 to 42 and mean BMI was 28; majority belonged to grade I & grade II obesity (n=109, 96.46%). Only 4 patients (3.53%) in our study had morbid obesity (BMI > 40), among these three were females (75%).

86 patients (76%) had defect size less than 4 cm while the remaining 27 patients (23.8%) had larger hernia defect. BMI of patients with larger hernia defect was >30.

There was single defect in 101 patients (89.4%) and in 12 patients (10.6%) more than one defect was observed.

Operative time ranged from 50.00 to 81.5 minutes; mean operative time was 67.093 minutes. Reasons for prolonged operative time were difficult dissection in obese patients, adhesions between contents and the sac and presence of more than one defect.

Drains were used in all patients and removed when drain output decreased to less than 20 ml/day. The period of drainage ranged from 3-8 days with average period being 4-6 days.

Postoperatively 82 patients (72.56%) recovered uneventfully, 31 patients (27.4%) developed various wound related complications.

Table No. 1: Postoperative complications

Outcome	Frequency (n)	% age
Recovered	82	72.5
Seroma	12	10.6
Sup. wound infection	8	7
Mesh infection	5	4.4
Haematoma	3	2.6
Recurrence	3	2.6
Total	113	100.0

Among those who developed complications, 12 patients (10.6%) developed seroma, which was managed by needle aspiration and local dressings; 3 patients (2.65%) developed haematoma, which also responded to needle aspirations; 8 patients (7%) encountered superficial wound infection and mesh got infected in 5 patients (4.4%). These patients were managed in outpatient department with antibiotics according to culture and sensitivity and local wound care. All responded to this treatment except 02 patients (1.76%)

who required extensive wound debridement with removal of grossly infected mesh.

Recurrence of hernia was observed in three patients (2.65%). (Table No. 01) When BMI of the patients who developed complications was reviewed, it was seen that most of the complications developed in patients who belonged to grade-II obesity, all 4 morbidly obese patients faced one or other wound related complications & majority of patients with normal BMI or grade I obesity recovered uneventfully. (Table No: 02)

Average postoperative hospital stay was 4.8 days; the reason for prolonged hospital stay was either some sort of wound complications, prolonged paralytic ileus or continuous drain output of more than 20 ml/day.

Table No. 2: Effect of Obesity on Outcome of Ventral Hernia Mesh Repair

Post operative complications= N (%)								
		Recovered	**Seroma**	**Sup. wound infection**	**Mesh infection**	**Hematoma**	**Recurrence**	**Total**
BMI Groups	**Normal < 25**	17 (15%)	2 (1.7%)	0	0		0	19 (16.8%)
	Grad I Obesity 25-30	43 (38%)	3 (2.6%)	2 (1.7%)	2 (1.7%)	1(0.8%)	0	51 (45.1%)
	Grad II Obesity 30-40	22 (19.4%)	7 (6.1%)	5 (4.4%)	2 (1.7%)	2 (1.7)	1 (0.8%)	39 (34.5%)
	Grad III Obesity > 40	0	0	1 (0.8%)	1 (0.8%)	0	2 (1.7%)	4 (3.5%)
Total		82 (72.56%)	12 (10.6%)	8 (7%)	5 (4.4%)	3 (2.65%)	3 (2.65%)	113

DISCUSSION

Ventral hernia includes both spontaneous and incisional hernia after an abdominal operation[13]. The estimated incidence of ventral hernia is 15-20%[14]. Different surgical options have progressed from simple tissue repair to mesh and recently introduced laparoscopic repair technique. In literature, obesity has been found to have an adverse effect on outcome of meshplasty especially it is feared for recurrent herniation[12]. Hernia recurrence is distressing to patients and embarrassing for surgeon[15]. According to literature, ventral hernia is common in middle age group though it can occur at any age. In our study mean age was 50.26 years (range = 24-75 years) with maximum number of patients (81.4 %) in 4th and 5th decade of life. In a study done by Berrovet and associates, mean age was 54.8 years[16]. Hamilton Le described mean age of 55 years and J M east mentioned mean age of 46 years in his study[10].

Incidence of ventral hernia is more in females. In our study 94 patients (83%) were females and female to male ratio was 4.8:1. This is supported by a study done by Malik AM in which 81% patients were female[17]. Another study done by Linas Venclauskas also showed female preponderance (74%) [18]. Rajesh Godara and Gleysteen however found a male predominance in their studies with male to female ratio of 2.3:1.7 and 3:1 respectively.[16 19]

In a series of 61 patients, 33 patients had Incisional hernia[10] and Incisional hernia was the most common type of ventral hernia in our study also (48.6%) followed by Paraumbilical hernia in 35 patients (30.9%), Epigastric hernia in 13 patients (11.5%) and Umbilical hernia in 10 patients (8.84%).

In our study mean BMI was 28 kg/m^2 (range= 23-42) with majority belonging to grade I and grade II obesity.19 patients (16.8%) had normal BMI and four patients were morbidly obese (BMI>40). This is comparable with a study done by Berrovet in which mean BMI was 28.2 kg/m^2. [16] In another study mean BMI was 33.3 kg/m^2. [20]

Mean operative time in our study remained 69.093 minutes; this is in contrast to an average operative time of 63.15±15 minutes and 79.9 minutes in studies done by Rajesh Godara and Berrovet respectively[15 16].

Average postoperative hospital stay was 4.8 days in our study which is quite comparable with other studies[8, 16]; while in Rajesh Godara's study mean postoperative hospital stay for sublay mesh repair was 6.8±1.5 days[15].

The ultimate test of any hernia operation is the recurrence rate; other desirable features are ease of performance and minimal complications[10].

Wound related complications in our study were Seroma in 12 patients (10.6%), Haematoma in 3 patients (2.65%), Superficial wound infection in 8 patients (7%), Mesh infection in 5 patients (4.4%) and recurrence in 3 patients (2.65%). This is comparable with many national and international studies which include a study done by Kurzer on open sublay mesh repair in which incidence of seroma was 9.6%[7]. In a long term follow up of 254 ventral hernia patients treated by sublay meshplasty, incidence of haematoma was 4% [21].

Superficial wound infection was found in 4% cases as described by two studies done separately by Corey W. Iqbal et al and Gleysteen.[19 21] Incidence of mesh infection was 3% in Corey W. Iqbal et al series[21] and 1.6% in a Martin Kurzer's study[7]. In contrast incidence

of wound related complications is higher as shown in few other studies[8 10].

Major problems with comparing recurrence rates are that ventral hernia are such a heterogenous group and recurrence is impacted by such a large number of variables that crude recurrence rates in published series are not comparable[10]. In the words of Korenkor et al "repairs have been performed by different surgeons on different patients in different countries" [22]

Considering important aspect of our study, we found obesity to have a negative impact on outcome of ventral hernia meshplasty. Majority of patients who developed complications had BMI >30. All patients who were morbidly obese (BMI >40) faced complications and majority of those who had normal BMI or grade I obesity recovered uneventfully. This is supported by a study done by Sajjad Ahmed[23]. In our study recurrence rate in morbidly obese patients was 6.4% which is comparable with a study which shows recurrence rate of 8.3%[24]. In contrary to this no relationship was found between obesity and different wound related complications including recurrence as shown in few other studies [26, 12].

CONCLUSION

Meshplasty in ventral abdominal herniae is the ideal treatment option with less postoperative complications and very little risk of recurrence. Preoperative identification of risk factors including obesity that predispose to postoperative complications is very essential. Results of our study affirm that obesity has an adverse effect on outcome of ventral hernia mesh repair. Therefore we recommend preoperative weight reduction in patients with BMI more than 25. This will definitely make the mesh repair successful & will reduce the complication rates especially recurrence.

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Address for Corresponding Author:
Dr. Azhar Ali Shah,
Asstt. Prof. of Surgery,
GMMMC, Sukkur
Cell No: 0300-3416174
e-mail: Surgeonazhar@yahoo.com