

## Outcomes of Laparoscopic Ventral Hernia Repair in Obese patients

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### ABSTRACT

**Background:** Obesity is a risk factor for primary ventral hernia. Surgery is deferred in obese patients because of overweight but most of patients present in emergency with obstructed /strangulated hernia in which outcome is poor.

**Aim:** To compare the primary outcomes (seroma, surgical site infection and recurrence) and secondary outcomes (duration of surgery and postoperative pain) in obese and non obese patients after laparoscopic primary ventral hernia repair.

**Study design:** Prospective comparative study

**Setting & duration:** B V Hospital /Quaid-e-Azam Medical College Bahawalpur, 01-01-2019 to 31-08-2021

**Method:** This study was done on 70 patients above the age of 25 years undergoing laparoscopic IPOM (intraperitoneal onlay mesh) after closure of fascial defect for primary ventral hernia. Patients with history of obstructed /strangulated hernia were excluded. Patients were divided into 2 groups (Patients with BMI <30 kg/m<sup>2</sup> - Group A and patients with BMI ≥ 30 kg/m<sup>2</sup>- Group B). Data was calculated regarding patient's age, sex, BMI, comorbidities, type of hernia, hernia size, primary outcome (postoperative complications-seroma, surgical site infection and recurrence) and secondary outcome (duration of surgery and pain). Statistical analysis using SPSS version 22 was done and it was considered significant when p value was <0.05.

**Results:** 29 (41.43%) had BMI < 30 kg/m<sup>2</sup> and 41 (58.57%) had BMI ≥ 30 kg/m<sup>2</sup>. The most common comorbidity was diabetes mellitus (17.1%) in both groups. 38 patients presented with paraumbilical hernia and 32 patients with epigastric hernia. A significant correlation between size of defect and post operative complications. (p value 0.042) was found. A significant correlation between comorbidities and complications was also found (p value 0.001). Complications being more common in group B patients but were not statistically significant (p value 0.979). Duration of surgery being higher in group B patients but was not statistically significant. (p value 0.194). There was no significant difference in postoperative pain in both groups.

**Conclusion:** Obesity has no significant effect on postoperative complications (seroma, surgical site infection and recurrence), duration of surgery and postoperative pain after laparoscopic IPOM repair. Comorbidities are significantly associated with postoperative complications rather than increased BMI. So surgery should not be delayed in obese patients.

**Key words:** Primary Ventral Hernia, Obesity, BMI (Body Mass Index), IPOM (Intraperitoneal Onlay Mesh)

### INTRODUCTION

Obesity is becoming a big medical problem as the prevalence is increasing continuously over the last few years. According to a survey done in Pakistan in 2016, obesity was observed as a major health problem. The incidence of obesity is 25% and prevalence is 42.8%. Obesity is more common in female. It is observed that up to 60% patients with ventral hernia have a body mass index (BMI) ≥ 30/kg/m<sup>2</sup>.<sup>1,2</sup> Epigastric, umbilical, Spigelian, and lumbar hernias are Primary ventral hernias<sup>3</sup>. Computerized Tomography [CT] is the investigation of choice in evaluating the abdominal wall and abdominal viscera in obese patients with ventral hernia<sup>4</sup>. Surgery in obese patients is more difficult than in normal weight patients and the wound complications rate is also higher in obese patients.<sup>5</sup> Incidence of incisional hernia is also higher in obese patient after ventral hernia repair<sup>6,7</sup>. Ventral hernia can be repaired by open and laparoscopic technique. Open retromuscular mesh placement is commonly used approach and is associated with decreased recurrence rates<sup>8</sup>. But open hernia repair is associated with considerable morbidity and postoperative complications like seroma formation and wound infection in patients with increased BMI<sup>9</sup>. Postoperative surgical complications rate is considerably less in laparoscopic ventral hernia repair (3.4 vs 10.5%, p < 0.001)<sup>1</sup> and on this basis laparoscopic surgery was started in obese patients.<sup>10</sup> Some midline defects which are not clinically appreciable in obese can also be detected laparoscopically<sup>11</sup>. That is why, laparoscopic ventral hernia repair is better than open repair<sup>12</sup>. After the closure of fascial defect an intraperitoneal onlay (IPOM) mesh is placed and this is the most commonly used laparoscopic technique<sup>13</sup>.

Surgery is deferred in obese patients because of overweight but most of the patients present in emergency department with obstructed /strangulated hernia in which outcome is poor.

The aim of our study is to compare the primary outcomes (postoperative complications-seroma formation, surgical site infection and recurrence) and secondary outcome (duration of surgery and duration of postoperative pain) in obese and non obese patients undergoing laparoscopic ventral hernia repair.

### MATERIAL AND METHODS

This prospective comparative study was conducted in Bahawal Victoria Hospital Bahawalpur /Quaid-e-Azam Medical College Bahawalpur from January 2019 to August 2021 on 70 patients undergoing laparoscopic IPOM (intraperitoneal onlay mesh) for primary ventral hernia after the approval from institutional ethical review board. Patients above the age of 25 years with diagnosis of primary ventral hernia were included in study. Patients with history of obstructed /strangulated hernia were excluded. Patients in Group A had BMI <30 kg/m<sup>2</sup> and patients in Group B had BMI ≥30kg/m<sup>2</sup>. Data was calculated regarding patient's age and sex ratio, BMI, comorbidities, type of hernia, hernia size, duration of surgery, duration of postoperative pain and postoperative complications. For IPOM repair, type of primary hernia was confirmed laparoscopically. Hernial defect size was measured after reduction of contents. The fascial defect was closed by prolene No.1 by interrupted sutures tied extraperitoneally. The polypropylene mesh was inserted with at least 5 cm overlap to all sides of the defect and fastened with absorbable tacks and fixed with trans-fascial sutures with prolene 2/0 passed by suture passer on four sides. The primary outcomes were postoperative complications (seroma, surgical site infection and recurrence). Secondary outcomes were duration of surgery and pain. All patients underwent regular follow up for one year for seroma, SSI (Surgical site infection), recurrence and postoperative pain. Statistical analysis using SPSS version 22 was done and it was considered significant when p value was <0.05.

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## RESULTS

There were 24 males and 46 females in this study. Mean age of the patients was 44.07±11.16. Minimum age was 25 years and maximum age was 65 years. Diabetes mellitus (17.1%) was the most common comorbidity in both groups but diabetes was more common in group B patients.

DM-Diabetes Mellitus, HTN- Hypertension, COPD-Chronic obstructive pulmonary disease, CVS-Cardiovascular, CLD-Chronic liver disease, 38(54.29%) patients had paraumbilical hernia and 32(45.71%) patients had epigastric hernia. In 41(58.57%) patients defect size was less than 4 cm. There was significant correlation between size of defect and complications as complications were more common in patients with defect size > 6cm (Table 2).

Duration of surgery was higher in group B patients but was not statically significant. Complications were more common in group B patients but were not statically significant (Table 3). There was no significant difference in postoperative pain in both groups

(Table 4). Complications were significantly higher in patients with comorbidities (Table 5).

Table 1: Patient' demographics

	Group A	Group B	Total
<b>Gender</b>			
Male	11	13	24(34.3%)
Female	18	28	46(65.7%)
Total	29 (41.43%)	41 (58.57%)	70 (100%)
Age (mean)	43.724±12.84	44.29±9.98	44.057±11.16
<b>Comorbidities</b>			
HTN	1	5	6( 8.6%)
CVS disease	1	1	2 (2.9%)
DM	4	8	12 (17.1)%
COPD	0	3	3 (4.3%)
CLD without ascites	3	0	3 (4.3%)
Total	9	17	26 (37.14%)
Smoking	4	4	8(11.43%)

Table 2: Hernia characteristics

		Group A BMI<30 KG/M <sup>2</sup>	Group B BMI ≥30 KG/M <sup>2</sup>	Total	P value
Hernia Types	Paraumbilical/umbilical	15	23	38(54.28%)	.717
	Epigastric	14	18	32(45.72%)	
Hernial defect size	W1 >4cm	22	19	41(58.57%)	.042
	W2 4-10 cm	7	21	28(40%)	
	W3 >10 cm	0	1	1(1.4%)	
Mean size	Mean size	4.3448	5.2439		
	Standard deviation	+1.3699	+1.8813		
	Minimum size	3	2		
	Maximum size	7	12		

Table 3: Comparison of duration of surgery and complications rate in both groups

Parameters		Group A BMI<30 kg/m <sup>2</sup>	Group B BMI >30 kg/m	Total	P value
Patients		29	41	70	
Duration of surgery (minutes)		57.41±14.27	69.36±20.26	64.44±18.16	.194
Complications	Seroma	4(5.71%)	7(10.00%)	16(22.6%)	.979
	SSI	1 (1.43)	1 (1.43%)	2 (2.86%)	
	Recurrence	2 (2.86%)	3 (4.29%)	5 (7.14%)	
	Total	7(10.00%)	11(15.72%)	18(25.71%)	

Table 4: Postoperative pain (visual analogue score)

	Group A	Group B	P value
Pain on day 1(mean value)	6.44±.503	6.5±.506	.632
Pain on day 2	5.47±.506	5.5±.506	.649
Pain on day 15	0.5±.662	0.638±.798	.418
Pain after 4 month	0.08±287	0.027±1.666	.276

Table 5: Correlation between complications and comorbidities

Complications	Patients with comorbidities						Patients without comorbidities	P value
	HTN	CVS Diseases	DM	COPD	CLD	TOTAL		
Seroma	3	0	2	1	1	7	4	.001
SSI	0	0	2	0	0	2	0	
Recurrence	0	0	0	2	1	3	2	
Total	3	0	4	3	2	12	18	

SSI-Surgical Site Infection, DM-Diabetes Mellitus, HTN- Hypertension, COPD-Chronic obstructive pulmonary disease, CVS-Cardiovascular, CLD- Chronic liver disease

## DISCUSSION

Obesity is not only a major health problem in Pakistan but its prevalence is also increasing in western world where majority of the population is overweight or obese<sup>2,14</sup>. Comorbidities associated with obesity and compromised wound healing increases postoperative morbidity<sup>15</sup>. In our study, male to female ratio was 1:1.9. Same results were reported in other studies<sup>16</sup>. In our study, there were 29(41.43%) patients with BMI less than 30kg/m<sup>2</sup> and 41(58.57%) patients with BMI ≥30kg/m<sup>2</sup>. In a study conducted by Owei et al<sup>17</sup>, they also reported that 58.5% patients were obese. In our study mean BMI in group A was 23.5kg/m<sup>2</sup> and mean BMI in group B was 33.52 kg/m<sup>2</sup>. Chelala E and Barake H et al reported mean BMI of 37kg/m<sup>2</sup> in study of 1326 patients<sup>18</sup> and they documented obesity as major risk factor for recurrence. In the present study, complications rate in obese and non-obese patients (10% versus 15.72%) was not significantly different. Ching et al

reported that postoperative morbidity is not significantly affected by obesity in patients of laparoscopic ventral hernia repair<sup>19</sup>. In other study laparoscopic repair in obese and non obese patients had no significant difference regarding postoperative complications<sup>20</sup>. In our study, 5(7.14%) patients developed recurrence in one year follow up. In group A there were 2 (2.86%) patients who developed recurrence and 3(4.29%) patients in group B developed recurrence. Malik A also reported recurrence in 11(6.62%) patients after laparoscopic repair of PUH<sup>21</sup>. Recurrence rate was almost same in both groups in our study. Recurrence was significantly associated with size of defect rather than obesity in our study. Other studies showed that the size of the fascial defect is more important risk factor than obesity<sup>22,23</sup>. In our study, recurrence was more commonly noticed in patients with diagnosis of COPD (chronic obstructive pulmonary disease) as comorbidity. In our study all the 3 patients developed recurrence in one year. COPD

as a comorbid disease is also a major risk factor for recurrence. Same association was also observed in other studies<sup>24</sup>. In our study, 16(22.6%) patients developed seroma which was slightly higher in group B (10%) than group A (5.71%). Reports of seroma occurrence following laparoscopic ventral hernia repair vary between 0.5 and 78%<sup>25</sup>. In this study 2(2.86%) patients developed surgical site infection but one study reported 12% surgical site infection rate<sup>26</sup>. Duration of surgery was almost same in both groups. Mean duration of surgery was 64.44±18.16 minutes. M. Nardi Jr et al reported mean time of 54 minutes for ventral hernia repair<sup>6</sup>. Postoperative pain was not significantly different in both groups. In a study done by Marry M et al. the complications rate become doubled in patients who undergo emergency surgery for ventral hernia<sup>27</sup>.

This study was performed on small number of patients. We followed the patients for one year but recurrence can occur after one year<sup>28</sup>. However this study will encourage others to conduct the study on a larger scale.

## CONCLUSION

Obesity has no significant effect on postoperative complications (seroma, surgical site infection and recurrence), duration of surgery and postoperative pain after laparoscopic IPOM repair. Comorbidities are significantly associated with postoperative complications rather than increased BMI. So surgery should not be delayed in obese patients.

**Conflict of interest:** Nil

**Author's contribution:** MNI: Study Design, Data Collection And Data Analysis, ANI: Literature Review, MSK: Reference writing, UAK: Reference writing

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