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Original Article

Concomitant Bariatric Surgery and Open Ventral Hernioplasty: A Retrospective Study

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ABSTRACT

***Background*:** Ventral hernia is common in obese individuals. Obesity causes an increase in intra-abdominal pressure and poor wound healing, which results in the development of a ventral hernia. The treatment of hernia in obese individuals is a matter of debate, especially in patients undergoing bariatric surgery. Different modalities of treatment have been proposed by different authors for the management of ventral hernia in patients who are candidates for bariatric surgery. We aim to find a feasible option for the simultaneous treatment of obesity and hernia with minimum complications at an affordable cost.

***Methods*:** A retrospective analysis of 41 patients who underwent bariatric surgery and open pre-peritoneal mesh repair of ventral hernia at ILS Hospital, Kolkata, between 2009 – 2017 was done, and the results were analyzed based on demographic characters, intra-operative findings, and post-operative parameters. Patients underwent two types of bariatric procedure viz. Laparoscopic Sleeve Gastrectomy (LSG) and Mini Gastric Bypass (MGB).

***Results*:** Twenty-one patients underwent LSG, and twenty patients underwent MGB followed by open pre-peritoneal mesh repair of ventral hernia. The intra-operative and post-operative characters in both groups were comparable. Three patients developed seroma post-operatively; one patient developed a wound infection and underwent secondary suturing. There was no incidence of mesh infection or hernia recurrence in our follow-up.

***Conclusion*:** Our study shows that concomitant bariatric surgery and open pre-peritoneal mesh repair of ventral hernia is a feasible option with low morbidity, avoidance of mesh-related complications, and at a lower cost to the patient.

KEYWORDS: Laparoscopic Sleeve Gastrectomy (LSG), Mini Gastric Bypass (MGB), Body Mass Index (BMI), Intra-Peritoneal Onlay Mesh (IPOM).

Introduction

A ventral hernia is a common occurrence in obese and morbidly obese individuals. Obesity is responsible for the development of primary and recurrent ventral hernias due to the increase in intra-abdominal pressure.1 The increase in Body Mass Index (BMI) over 25 kg/m^2 increases the risk of development of ventral (incisional) hernia from

13% to 39%.[1] Obese individuals also have reduced wound healing potential, which is contributory to the development of ventral hernias.[1] An epidemic of obesity is spreading throughout the world[2], which in turn will lead to a higher incidence of ventral hernias. There is a linear relationship between BMI and ventral hernia presence.[3]

Ventral hernia repair in obese individuals is associated with a higher recurrence rate as well as a higher complication rate. Concomitant weight loss surgeries in such individuals will be beneficial for the patient and should be strongly recommended.[4] The various options to manage these hernias are Bariatric surgery with repair of ventral hernia at a later stage after substantial weight loss, Bariatric surgery with primary ventral herniorrhaphy, Bariatric surgery with ventral hernia repair with biological mesh and Bariatric Surgery with ventral hernia repair with prosthetic Mesh.[5]

Because of the limited number of studies, no consensus exists regarding the ideal strategy. Cases need to be individualized with respect to BMI, defect size, type of bariatric procedure, and comorbidities. Current evidence suggests that mesh repairs are not contraindicated in clean-contaminated surgeries like Laparoscopic Sleeve Gastrectomy (LSG) and Gastric Bypass.[6,7,8] We adopted the approach of bariatric surgery with open pre-peritoneal mesh repair of ventral hernia.

The objective of the study is to assess the outcome of concomitant bariatric surgery and open pre-peritoneal mesh repair of ventral hernia in morbidly obese patients and to provide a cost-effective treatment with minimum morbidity.

Materials and Methods

We obtained the approval of the institutional review board and then collected the data of the patients who underwent concomitant bariatric surgery and open pre-peritoneal mesh repair of ventral hernia at ILS Hospitals Salt Lake, Kolkata between 2009 – 2017. A retrospective analysis of these patients was done. The surgery was performed by a single team of surgeons.

The patients underwent two types of bariatric surgeries at our center, viz. LSG and Laparoscopic Mini Gastric Bypass (MGB). The hernial contents were reduced laparoscopically. The patients underwent ventral hernioplasty by open pre-peritoneal placement of prolene mesh after completion of bariatric surgery. The defect was closed with prolene. A suction drain was placed in the subcutaneous plane, and the skin was closed with nylon.

The patients were then analyzed retrospectively based on demographic characters, intra-operative findings, post-operative parameters, and complication rates.

The inclusion criteria were patients aged between 18 - 65 years with BMI > 30 kg/m^2. Patients with hernia defect size of > 5 cm were excluded from the study.

Results

A total of 41 patients were identified who underwent bariatric surgery with open pre-peritoneal mesh repair between 2009 – 2017 and met our inclusion criteria. Their results were analyzed.

The bariatric procedures performed were LSG and MGB. LSG was performed in 21 patients, while another 20 patients underwent MGB.

The patients were followed up regularly at 1, 3, 6, and 12 months intervals. The patients were analyzed on demographic characters, weight, BMI, Excess Body Weight (EBW), size of the hernia defect, operative time, length of hospital stay, and complications.

The mean age (in years) for the LSG group was 49 ± 9.6 (35 – 63 years), and the MGB group was 49 ± 8.5 (36 – 60 years). The ratios of male to female for LSG and MGB were 1:6 and 1:9, respectively. The mean BMI was 42 ± 6.84 (33 – 59) in LSG and 42.6 ± 6.42 (31 – 52.2) in the MGB group. The mean defect size (in cm) was 3.29 ± 0.56 (2.5 - 4) for patients in LSG group and 3.05 ± 0.74 (2 - 5) in MGB group. (**Table 1**)

The operative time (in minutes) was 85.4 ± 15.2 in patients who underwent LSG, and 100 ± 14.6 in patients who underwent MGB. The median value for hospital stay in both groups was four days (3 – 6 days) with a median follow-up of 3 years (4 months – 8 years).(**Table 2**)

Three patients developed seroma post-operatively; one patient developed a wound infection and underwent secondary suturing. There was no incidence of mesh infection or hernia recurrence in our follow-up. (**Table 3**)

Discussion

Hernias are associated with precipitating factors and we should always take care of these factors before or during hernia repairs. This reduces the chances of recurrence post-operatively.[9] Ventral hernias are reported at an increased frequency in obese individuals.[10] They may be diagnosed pre-operatively or may be detected intra-operatively. Datta *et al*. showed an incidence of 8% for intra-operatively detected ventral hernia in patients who underwent bariatric surgery.[11] This is due to the chronically elevated abdominal pressure, which predisposes to the development of a ventral hernia.[1]

The management of ventral hernia is still a matter of debate in patients undergoing bariatric surgery, as the studies for these types of cases are very few.

Obese patients presenting with a ventral hernia should undergo substantial weight loss pre-operatively. This was shown by Raftopoulos *et al*., who reported a complication rate of 25.9% and a recurrence rate of 18.5% is present in patients undergoing ventral hernia repair with BMI > 35 kg/m^2.[12]

There are various options available for obese patients undergoing bariatric surgery with hernia repair.

(a) Leaving the hernia unrepaired and planning for a mesh repair at a later date. This method was shown to have no complications at an average follow-up of 14 months by Datta *et al*. This may not be possible in patients undergoing bariatric surgery, especially gastric bypass procedures, as the omentum needs to be mobilized for the facilitation of the procedure.[11]

(b) Reducing the contents without repair may also be an option, but Eid *et al*. showed that there was a 33% chance of small bowel obstruction in cases where the hernial contents were reduced without repair.[4]

(c) Datta *et al*. showed that primary repair of hernia without mesh, as an option, was associated with high chances of recurrence and small bowel obstruction.[11]

(d) Praveen Raj *et al*. in their study showed that concomitant bariatric surgery with Intra-Peritoneal Onlay Mesh (IPOM) / IPOM Plus gave good results, but the cost burden on the patient was high.[5] The concern of mesh infection in concomitant bariatric surgery and mesh hernia repair exists, but many reports of mesh utilization in clean-contaminated fields suggest otherwise.

Table 1: Demographic data and intra operative parameters.

Parameters	LSG	MGB
Age (years)	49 ± 9.6	49 ± 8.5
Sex (M:F)	1:6	1:9
Mean Weight (kg)	103.1 ± 16.72	103.9 ± 15.4
Mean BMI (kg/m^2)	42 ± 6.84	42.6 ± 6.42
Mean EBW (kg)	46.92 ± 14.95	47.9 ± 14.3
Mean defect size (cm)	3.29 ± 0.56	3.05 ± 0.74
Operative Time (mins)	85.4 ± 15.2	100 ± 14.6

Table 2: Post operative parameters.

Post-op parameters	Median Values
Hospital stay	4 days
Drain removal	2 days
Suture removal	12 days (10 days-14 days)
Median follow up	3 years (4 months-8 years)

Table 3: Post operative complications.

Complications	Numbers
Seroma	3
Wound infection	1
Re-suturing	1
Mesh infection	Nil
Recurrence	Nil

A review article by Rao *et al*. suggested that concomitant bariatric surgery and ventral hernia repair should be employed if hernia reduction was performed and in hernias with a small neck.[13]

In our study, with a median follow-up of 3 years, we observed that combining bariatric surgery with open pre-peritoneal mesh repair gave good results with no incidence of mesh infection or hernia recurrence post-operatively. It was found to be associated with low morbidity and lower financial burden for the patient, albeit with a longer operative time.

Gastric bypass is a clean-contaminated surgery. There is enough evidence to show that the placement

of prosthetic mesh in clean-contaminated cases is not associated with increased risk of wound infection and other mesh-related complications.[14,15,16]

The underlay technique we used in our hernia repair was associated with the lowest recurrence rate and lowest rate of surgical site infection. However, Chan *et al*. showed that the risk of mesh infection could reach up to an incidence of 5.56 % when a simultaneous gastro-intestinal division procedure was performed along with mesh hernioplasty.

Three of our patients presented with a seroma in the post-operative period. They were managed by image-guided aspiration of the collection and were asymptomatic in the subsequent follow-up. One patient developed wound infection, which was managed by regular dressing and secondary suture.

The limitations of our study are that it is a single surgeon, single center-based retrospective study with limited sample size.

Conclusion

In conclusion, our study shows that concomitant bariatric surgery and open pre-peritoneal mesh repair of ventral hernia is a feasible option with low morbidity, avoidance of mesh-related complications, and at a lower cost to the patient.

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