



Impact of overweight and obesity on the Postoperative outcome of patients undergoing incisional Hernioplasty in the short-stay surgery unit of a Termissionary hospital

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Abstract

Introduction: There are numerous publications on incisional hernioplasty series; however, these series describe patients with different weight characteristics, which is why this article aims to describe the relationship of said morbidity with overweight and obesity.

Objective: Determine the impact in the postoperative evolution of overweight and obese patients undergoing incisional hernioplasty by open approach or by laparoscopic approach.

Material and Method: Retrospective cross-sectional study carried out in a short-stay unit in a tertiary hospital from 2021 to 2023 in which all patients who presented incisional hernia and underwent open and laparoscopic incisional hernioplasty were included. The patients were divided in 3 groups by their body mass index (BMI), the first group A was classified as normal weight, the second group B as overweight and the third group C as obesity. An epidemiological characterization of the patient and characterization of the incisional hernia were carried out. and complications were evaluated, based on the Clavien-Dindo classification of surgical complications.

Result: A total of 94 patients underwent incisional hernioplasty where 87.2% presented BMI above 25 Kg/m², group C (obesity) was the group with the most patients (53), 79.8% of patients the defect was in midline. Open surgery was performed on 82 patients, with an average of 2.5 hours. Complications were evident in 31 patients, with seroma being the most frequent complication, and a recurrence occurred in 9 patients (9.6%).

Conclusions: There is an impact of overweight on the incidence of complications and an impact of obesity on the incidence of recurrence, within of the postoperative evolution of patients undergoing incisional hernioplasty.

Keywords: obesity, overweight, incisional hernia, hernioplasty

Introduction

Abdominal incisional hernia is defined as any defect in the abdominal wall space secondary to a postoperative scar perceptible by clinical and radiological examination.¹ Incisional hernia continues as a complication that commonly occurs in patients undergoing laparotomy, there are incidences that vary according to the literature; ranging from 10-20%²; or ranges of 5-70% of patients produce an incisional

hernia,¹ This pathology is multifactorial where it is affected by age, male sex, smoking and comorbidities such as diabetes mellitus, chronic lung diseases and obesity which generates a risk factor 3 times higher. Obesity has increased significantly in recent years, the study by Flegal et al.³ evaluated obesity trends from 2005 to 2014 where they showed a prevalence of up to 35%²¹ REV GUATEM CIR VOL 30 (2024) in men and 40% in women. This pathology is a cause of morbidity and postoperative recurrence because the obese patient experiences inefficient

hypermetabolic responses, oxidative stress and immunosuppression,⁴ this chronic state of low-grade inflammation in the body generates a disruption in angiogenesis and collagen synthesis, which leads to a delay in wound healing,¹⁻². Studies show greater postoperative complications in patients with obesity, Giodarno et al.⁴ showed complications of up to 15% more in obese patients. VanSilfhout et al. Showed greater recurrence in obese patients⁵ The repair of an incisional hernia can be repaired laparoscopically or by open surgery, and in order to reduce the risk of recurrence, the use of prosthetic material is highly recommended, since despite the use of mesh there is a recurrence after 5 to 10 years, with ranges between 25-32%,⁵. Since laparoscopic surgery has been the gold standard for most procedures and incisional hernia repair is no exception, however, the literature shows that there are very variable rates of recurrence with laparoscopic repair (8.7-28.5%) compared to open surgery (9.9-13.5%),⁵ Despite the data there is still no consensus on which surgical technique is ideal to use with obese patients, in regards to open surgery, retromuscular implantation is the one that is most accepted because the mesh is held on the deep surface of the muscles with abdominal pressure, however open surgery generates greater morbidity and surgical site infections even more in obese patients², which is why laparoscopic surgery has generated a trend, in turn by decreasing the length of hospital stay, postoperative pain, morbidity and recurrence.²⁻⁶. In Guatemala, few studies are conducted on obese patients undergoing surgery. It is important to understand the impact of obesity on abdominal wall pathology, as it is a potential risk factor for mesh integration failure and scarring. Therefore, it is necessary to assess the relationship with obesity in order to implement prehabilitation protocols prior to performing any type of procedure.

The objective of this study is to determine the impact on the postoperative outcome of overweight and obese patients undergoing incisional hernioplasty using an open or laparoscopic approach, evaluating the incidence of complications or recurrence, surgical time, and length of hospital stay.

Methods

A retrospective cross-sectional study was carried out in which all patients who underwent incisional hernioplasty by laparoscopic surgery and open surgery from January 2021 to December 2023 were evaluated. For this purpose, an epidemiological characterization of the patient was first carried out, describing sex, age, comorbidities, body mass index prior to surgery, characteristics of the incisional hernia, type of surgical approach, according to the management algorithm in the short-stay unit figure 1, and in the postoperative evolution the duration of the procedure, the days of hospital stay and what the complications were, according to the Clavien-Dindo classification of surgical complications⁷, within which chronic postoperative pain and surgical site infection were clinically evaluated, and by ultrasound the seroma, and recurrence.

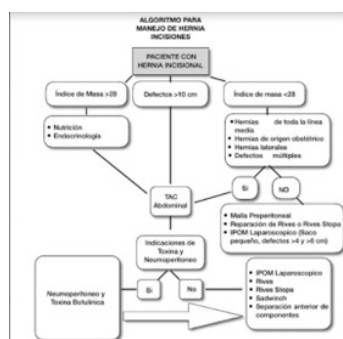


Figure 1: Management algorithm for the treatment of patients with incisional hernia in the short-stay surgery unit.

Patients were divided into 3 groups by their body mass index (BMI) according to the WHO, the first group A was classified as normal weight BMI in the range of 18.5-24.9 Kg/m², the second group B as overweight with BMI in the range of 25 to 29.9 kg/m² and the third group C as obesity with BMI > 30 Kg/m². To characterize the incisional hernia it was classified according to the European Hernia Association based on location (medial M or lateral L), size (W1 < 4 cm; W2 4-10 cm; W3 > 10 cm) and recurrence (R0; R1; R2), after which a comparison was made between the study groups.

Statistical Analysis

Statistical analysis was performed using the Social Science Statistics package. A template was created in Microsoft Excel, where all data obtained from the data collection instrument were entered. The study results were analyzed according to the research objectives and variables. The chi-square test with contingency tables was used to associate two categorical variables: body mass index, sex, or comorbidities with incisional hernia characteristics, complications, or recurrences. The Fisher test was used to associate body mass index with specific complications, and one-way ANOVA was used for independent variables to evaluate body mass index with surgical time and hospital stay. A p-value of <0.05 was considered significant.

Results

A total of 94 patients underwent incisional hernioplasty between January 2021 and December 2023. Of the total patients, 87.2% presented some degree of obesity or overweight prior to surgery. The study population was divided into groups according to their body mass index (BMI). Group A a total of 12 patients (12.8%) with BMI within normal ranges. Group B a total of 29 patients (30.3%) with BMI overweight and group C a total of 53 patients (56.9%) with BMI in some degree of obesity, this group being the one with the largest population. (Table 1); of each group, the demographic characteristics were studied by group of patients, where 73.7% (n = 69) were female, with an average age was 53 years. A 38.3% of patients did not present comorbidity, the most frequent comorbidity being arterial hypertension at 31.9%. Among the characteristics of incisional hernia according to the European hernia classification are represented: location (L) was found in the midline in 75 patients (79.8%), with a W2 size in 39 patients (41.5%), and R1 recurrence found in 10 patients (10.7%), shown in Table 2.

Postsurgical Results

The data of the surgical procedure are represented in table 3 where the open incisional hernioplasty technique was performed most frequently in 82 patients (87.2%) where the RIVES type was the most frequent, The average surgical time was 2.5 hours, (p = 0.62), 75 patients had less than 24 hours of hospital stay (p = 0.34), both variables do not present statistical significance between the study groups. Postoperative complications were evident in 31 patients (32.9%), most frequently seroma in 13 patients, within which only 9.8% of patients had to be taken to the operating room. Table 4 presents the complications based on sex, comorbidities and type of surgical procedure, which did not present statistical significance in any case. Recurrence as a postoperative complication was evident in 9 patients (9.6%) without statistical significance.

Characteristics		Group A BMI 18.5-24.9 Kg/m ²	Group B IMC 25 to 29.9 kg/m ²	Group C BMI > 30 Kg/m ²	Total
sex	Female	5 (5.3%)	25 (26.6%)	39 (41.5%)	69 (73.7%)
	Male	7 (7.4%)	4 (4.3%)	14 (14.9%)	25 (26.3%)
Age (years)		50 (±23.3)	59 (±14)	50 (±11.9)	53 (±14.9)
Comorbidities	Diabetes	3 (3.2%)	3 (3.2%)	4 (4.3%)	10 (10.7%)
	Hypertension	0	12 (12.8%)	18 (19.1%)	30 (31.9%)
	Hypothyroidism	0	2 (2.1%)	4 (4.3%)	6 (6.4%)
	Cancer History	2 (2.1%)	3 (3.2%)	1 (1.1%)	6 (6.4%)
	Heart disease	0	1 (1.1%)	1 (1.1%)	2 (2.2%)
	Chronic kidney failure	1 (1.1%)	1 (1.1%)	0	2 (2.2%)
	No comorbidities	6 (6.3%)	7 (7.4%)	25 (26.5%)	38 (40.2%)

Table 1: Characteristics of patients undergoing incisional hernioplasty in the short-stay surgery unit of a tertiary hospital.

The table presents the main demographic characteristics of the study population

(age, sex and comorbidities) according to their body mass index, (source: data collection).

Characteristics		Group A	Group B	Group C		Total
Location (M)	M	9 (9.5%)	25 (26.6%)	41(43.7%)	p = 0.48	75 (79.7%)
	L	2 (2.1%)	3 (3.3%)	11 (11.7%)		16 (17%)
	L +M	1 (1.1%)	1 (1.1%)	1 (1.1%)		3 (3.3%)
Size (W)	W1	5 (5.3%)	8 (8.5%)	23 (24.5%)	p =0.61	36 (38.3%)
	W2	4 (4.2%)	16 (17%)	19 (20.2%)		39 (41.5%)
	W	3 (3.3%)	5 (5.3%)	11 (11.7%)		19 (20.2%)
Recurrence (R) preoperative	R0	11 (11.7%)	26 (27.6%)	47 (50%)	p = 0.95	84 (89.4%)
	R1 ≥	1 (1.1%)	3 (3.3%)	6 (6.4%)		10 (10.6%)
Surgical approach	Open	9 (9.6%)	25 (26.5%)	45 (47.9%)	p= 0.64	79 (84%)
	Laparoscopic	3 (3.3%)	4 (4.3%)	8 (8.4%)		15 (16%)

Table 2: Characteristics of Incisional Hernias.

P-value < 0.05 is considered significant

The characteristics of each incisional hernia preoperatively according to the European classification of incisional hernias, and the surgical approach planning for each patient group based on their body mass index (BMI). (Source: data collection).

Characteristics	Group A	Group B	Group C	Total
Procedures				
Rives Type	6 (6.4%)	21 (22.3%)	39 (41.5%)	66 (70.2%)
Malmo type	3 (3.3%)	1 (1.1%)	4 (4.2%)	8 (8.5%)
TAR Reverse	0	0	2 (2.1%)	2 (2.1%)
Sandwich Type	0	3 (3.3%)	0	3 (3.3%)
TAPP type	3 (3.3%)	2 (2.1%)	6 (6.4%)	11 (11.7%)
IPOM type n=94	0	2 (2.1%)	2 (2.1%)	4 (4.2%)
Duration of surgery (hours)	2.2 (±0.9)	2.53 (±0.9)	2.58 (±1.1)	
	p= 0.62			
Hospital stay (days)	1.25 (±0.6)	1.80 (±2.7)	1.28 (±0.6)	
	p=0.34			

Complications n=31	Without complications 63 patients (67%)			
Yo	0	6 (6.4%)	12 (12.8%)	21
II	0	0	0	
IIIa	0	3 (3.3%)	3 (3.3%)	6
IIIb	0	4 (4.2%)	3 (3.3%)	7
IV	0	0	0	
V	0	0	0	
Pain	0 3 (10.3%) 0			3 (3.2%)
SSI	0 6 (20.7%) 1 (1.9%)			7 (7.4%)
Seroma	1 (8.33%) 10 (3.4%) 1 (18.8%)			12 (12.8%)
Postoperative recurrence	0 3 (10.3%) 6 (11.4%)			9 (9.6%)
	p= 0.027			

Table 3: Characteristics of the surgical procedure and postoperative complications.

P-value < 0.05 is considered significant

The main items of the surgical procedure, the types of approaches, the time of surgery and the days that the patient was admitted to the ward are presented. The lower part shows the post-surgical complications grouped according to Clavien-Dindo classification where I does not require surgical, endoscopic or radiological treatment, II requires

pharmacological treatment, IIIa treatment that does not require general anesthesia, IIIb requires general anesthesia, IV requires intermediate or intensive treatment, V mortality. Body mass index BMI (source: data collection)

The number of complications of incisional hernias is described according to the sex of patients, the presence of comorbidities and the type of surgical approach (source: data collection)

Feature	Complications	No complications	
Sex	22 (23.4%)	47 (50%)	p= 0.70
Women			
Man	9 (9.6%)	16 (17%)	
Comorbidity	21 (22.3%)	37 (39.4%)	p= 0.39
With comorbidity			
No comorbidity	10 (10.6%)	26 (27.6%)	
Procedure	28 (29.8%)	54 (57.4%)	p= 0.52
Open			
Laparoscopic	3 (3.1%)	9 (9.6%)	

Table 4: Postoperative complications.

P-value < 0.05 is considered significant.

Feature	YEAH	NO	
Sex	8 (8.5%)	61 (64.9%)	p= 0.26
Women			
Man	1 (1.1%)	24 (25.5%)	
Comorbidity	6 6.3%)	52 (55.3%)	p= 0.74
With comorbidity			
No comorbidity	3 (4.2%)	33 (46.7%)	
Type of approach	7 (7.4%)	75 (79.8%)	p=0.37
Open Surgery			
Laparoscopic Surgery	2 (2.1%)	10 (10.6%)	

Table 5: Postoperative recurrence

P-value < 0.05 is considered significant

surgical approach (source: data collection).

The frequency of incisional hernia recurrence is described according to the sex of the patients, the presence of comorbidities and the type of

Discussion of Results

Obesity is defined as the abnormal or excessive accumulation of fat. The BMI is the measure used to classify patients as overweight or obese. The WHO classifies a normal BMI as 18.5–24.9 kg/m²; a BMI of 25–29.9 kg/m²; and an obese BMI as >30 kg/m². 8 The prevalence of obesity is increasing, with up to 13% of the total population reported to have some degree of obesity. 8 The prevalence, according to Carron et al., in terms of sex in 2019, was 31% in men and 33% in women, compared to 31% in women. with the present study there is a higher frequency in women than in men, 68% and 19.2% respectively, this is because the male population was lower compared to the female. There is a greater number of patients with comorbidities in states of obesity

and overweight9 in the present study an increase in comorbidities was evidenced in 30-22% respectively, which coincides with the literature, hypertension (30%) and Diabetes Mellitus (10%) were the most frequent comorbidities, similar to the Alizaia et al2 study.

Within the surgical parameters, more open surgical procedures were performed (79%) compared to the laparoscopic approach (15%). The Rives-type open approach was the most performed. This is because each patient was evaluated and planned individually, and the laparoscopic curve is still in the learning process. The surgical time is not statistically significant and was very similar in the three study groups: 2.5 hours, a shorter time compared to international studies such as Giordano et al., but longer when compared to studies by Van Silfhout et al. or Alizaia

et al. Where the average of 90 minutes, evaluating the average hospital stay in the present study was less than 48h, similar in the 3 study groups, which presented statistical significance, since the unit is short stay seeks to keep patients short, were 7 patients who were more than 48 hours of stay which were related to pain and surgical site infections, Abdominal incisional hernia repair in obese patients produces a high risk of perioperative morbidity and recurrence, in the study of Sauerland et al. a recurrence of 11%10 was evidenced, and in the study of Hamid et al. 7%, in both studies it was not significant between obese and non-obese patients, the present study shows a rate of recurrence of incisional hernia in 9 patients (9.6%), being not significant between the study groups, however, it is evident that patients with weight in normal range, did not have any recurrence, this is due to the population of patients in group A, the majority did not present modifiable risk factors such as diabetes mellitus (only 3), arterial hypertension and obesity, which according to the European Hernia Society can generate up to 2 times more the incidence of recurrence11. The recurrence observed according to the presence of any comorbidity was 3 times more than patients without comorbidity, where arterial hypertension presented 50% of the recurrences, similar to the study by Benoit et al. where there is greater recurrence in patients with some comorbidity, but diabetes being the complication with the highest risk12. The complications observed comparing the study groups showed that overweight and obese patients had more complications, where only one could be seen in group A with normal weight, similar to Alizaia and Cols2, however, in the study by Siok and Cols, the complications are similar between the obesity group and patients without obesity.13

Conclusions

There is an impact of overweight on the incidence of complications and an impact of obesity on the incidence of recurrence within the postoperative course of patients undergoing incisional hernioplasty.

Obesity and overweight have no impact on surgical time and hospital stay.

High blood pressure is the comorbidity that has the greatest impact on the incidence of complications and recurrence.

There is no impact of complications and recurrence depending on the type of surgical approach.

Recognitions

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