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Incidence of Intestinal Obstruction Secondary to Petersen's Hernia after Laparoscopic Roux-en-Y Gastric Bypass

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ABSTRACT

Objective: Identify the incidence of Petersen's hernia in gastric bypass patients at our institution.

Summary: Laparoscopic gastric bypass has proved to be the best treatment for obesity and the resolution of their complications, however, it presents long-term complications such as Petersen's hernia.

Methods: A retrospective study of a single center, with a total of 225 gastric bypass performed in the bariatric and metabolic surgery clinic of the Hospital Civil de Guadalajara "Dr. Juan I. Menchaca" from January 2014 to March 2020.

Results: Of the 225 operated patients, a global follow-up of 80.44% was obtained, with an average postoperative follow-up of 31 (+/-20.92) months, it was found that in 10 patients (4.44%) presented a symptomatic internal hernia. Of these, 9 patients was admitted to the emergency room and 1 detected in the outpatient clinic. These patients presented at the time of surgery a BMI of 27.65 (+/- 5.01) with a percentage of excess weight lost of 62.35% (+/- 25.60). The laparoscopic approach could be completed in 100% of the cases. Regarding hospital stay, an average of 1.1 (+/- 0.31) days was presented. No trans-surgical complications or mortality were reported in the group studied. The mean time between primary surgery and reoperation was 21.3 (+/- 12.98) months.

Conclusion: In a 6-year period with a global follow-up of 80.44%, where the Petersen defect was not closed. An incidence of 4.44% was found, with an average follow-up of 31 (+/- 20.92) months. However, the percentage of Petersen's hernia may be underestimated since only those with symptoms that lead the patient to emergency care are usually diagnosed, so a high index of suspicion must always be had.

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INTRODUCTION

Mexico is currently among the first places for obesity worldwide. Obesity is associated with an increased risk of cardiovascular events, diabetes, cancer, decreased life expectancy and quality of life. Bariatric surgery is currently

the best way to achieve long-term weight loss. Stenberg et al. [(1)].

Bowel obstruction syndrome is a known complication of bariatric. Most are caused by internal hernia. Abasbassi et al. [(2)]. The most common site of internal hernias in laparoscopic antecolic Roux-en-Y gastric bypass is through the Petersen space followed by the mesenteric gap of the jejunum-jejunum anastomosis. Mayo et al. [(3)].

Internal hernias typically occur a few months after the surgical procedure, probably caused by the rapid reduction of intraperitoneal fat, which in turn leads to an enlargement of the surgically created mesenteric defects, this leads to prolapse of intestinal loops in these spaces. Mayo et al. [(3)].

The clinical presentation of an internal hernia can range from intermittent atypical symptoms to a dramatic acute abdomen secondary to necrosis or perforation of the small intestine. Al Harakeh et al. [(4)].

A highly variable incidence of intestinal obstruction syndrome has been reported, ranging from 2-16%, Stenberg et al.[1]. Al Harakeh et al. [(4)]. De la Cruz et al. [(5)]. Amor et al. [(6)]. As well as secondary to Petersen's hernia ranging from 0.68% Aghajani et al. [(7)]. to 6.3% Abasbassi. Et al. [(2)]. Al-Mansour et al. [(8)].

Data from different studies of gastric bypass patients suggest that routine mesenteric defect closure could reduce postoperative internal hernia rates.[6] However, internal hernias can develop despite closure of mesenteric defects. It is also known that closure alone can increase the risk of intraoperative complications such as: bleeding, stenosis with small bowel obstruction, and anastomotic leakage as vascular flow is compromised. Stenberg et al. [(1)]. Perim et al. [(9)].

In the study by Champion, J K et al. Observed that in the group of operated patients where they closed the mesentery spaces they found a higher rate of obstruction due to adhesions, and in the group where they were not closed, they found a higher rate of internal hernias. Champion et al. [(10)].

MATERIALS AND METHODS

We carried out a retrospective study of a single center, with a total of 225 gastric bypass performed in the bariatric and metabolic surgery clinic of the Hospital Civil de Guadalajara "Dr. Juan I. Menchaca" from January 2014 to March 2020.

Data were retrospectively analyzed from the physical and electronic records of the center for morbid obese patients undergoing bariatric surgery, as well as by telephone call. The following variables were collected: Body mass index (BMI) at two different time points, at the time of the bypass and at the time of the complication, excess weight prior to surgery, percentage of excess weight lost at the time of emergency surgery, symptoms and signs, surgical approach (laparoscopic or open), if the surgery was emergency or elective, location of the internal hernia, reduction of the internal hernia, closure of the mesenteric defect, postoperative complications and mortality.

All the Roux-en-Y gastric bypass was performed laparoscopic, antecolic without closed the Petersen defect, but the mesenteric defect of the jejunum-jejunum was closed.

The postoperative follow-up was carried out according to the protocol of the center, institutional visit in a week, 1, 3, 6 and 12 months and later annually, telephone calls were made to all patients to complete the registry.

The diagnosis of Petersen's hernia was made by intestinal obstruction clinic with peritoneal irritation, with and without abdominal tomography and patients that in consult present intermittent clinic of partial intestinal obstruction. The patients were taken to emergency or elective surgery using a laparoscopic approach, evaluating the mesenteric spaces, reducing the herniated content, and closing the Petersen defect.

RESULTS

Of the 225 operated patients, a global follow-up of 80.44% (181 patients) was obtained, with an average postoperative follow-up of 31 (+/-20.92) months, it was found that in 10 patients (4.44%) all female, presented a symptomatic internal hernia. Of these, 9 patients was admitted to the emergency room with symptoms of intestinal obstruction with or without acute abdomen data, 5 of them underwent a contrasted abdominal tomography finding data suggestive of hernia in Petersen's space. The other patient presented clinical symptoms of intermittent abdominal pain accompanied by data of partial intestinal obstruction, detected in the outpatient clinic, for which she was scheduled for elective surgery. The characteristics of patients are shown in Table 1.

These patients presented at the time of surgery a BMI of 27.65 (+/- 5.01) with a percentage of excess weight lost of 62.35% (+/- 25.60). The laparoscopic approach could be completed in 100% of the cases. Finding as intraoperative a Petersen space hernia. The reduction of the herniated content was achieved without finding evidence of intestinal distress and / or perforation. The Petersen space was closed with a continuous 2-0 non-absorbable suture in all cases.

Regarding hospital stay, an average of 1.1 (+/- 0.31) days was presented. No trans-surgical complications or mortality were reported in the group studied. The mean time between primary surgery and reoperation was 21.3 (+/- 12.98) months.

DISCUSSION

Closed the Petersen defect within a bypass does not guarantee that there will not be a complication in this gap, however, if it adds severe postoperative complications that can be up to 4.3%. Stemberg et al. [(1)].

Intestinal occlusion secondary to internal hernia is an important complication in patients undergoing gastric bypass,

it is important to maintain a high degree of suspicion in patients who present symptoms of intermittent intestinal obstruction due to the complexity of the diagnosis. However, in our center, despite being a teaching hospital and the Petersen space is not routinely closed, a similar or even lower casuistry has been found compared to that reported in the literature worldwide.

During the study, 9 patients were found who were admitted to the emergency room due to symptoms of intestinal obstruction with acute abdomen and one patient electively scheduled for intermittent symptoms of abdominal pain and partial intestinal obstruction. Detecting an incidence of symptomatic Petersen space hernias of 4.44%. Concordant with the incidence published in other reports, being one of the main causes of internal hernia. Abasbassi et al. [2]. Mayo et al. [3]. De la Cruz et al. [5]

One of the theories about when this complication occurs is based on the significant loss of weight, mainly fat, which could make the Petersen space larger, in this study the percentage of excess weight lost at the time of presenting this complication was 62.35 (+/- 25.6) months, being similar to that found in other populations. Kristensen et al. [11].

When the mesenteric defect of Petersen's space is closed, intra- and post-operative complications may increase, Setenberg et al [1], in addition to not guaranteeing that an internal hernia will not develop. Some studies found no difference when performing closure continuously or interrupted. Ahmed et al. [12]. It is also not clear what is the time of presentation of an internal hernia, occurring more frequently after a significant loss of weight, in this study the average presentation was 21.3 (+/-12.98) months, similar to the presentation time found in other studies such as that of 20 months, De la Cruz Muñoz et al. [5] and 24.2 months in the study of Magali Blockhuys et al.[13].

We were able to demonstrate that the laparoscopic approach is feasible for the detection, reduction and closure of mesenteric defects when a symptomatic internal hernia occurs, regardless of its presentation as an emergency or electively. In this study we did not convert to open surgery, that in other studies the range goes up to 10.3% to 60%[11,14], that probably due to some occasions the patients are not operated by bariatric surgeons or in centers with experience in laparoscopic surgery.

LIMITATIONS OF THE STUDY

It was done with a retrospective information source. The sample of this study was limited since it was carried out in a single bariatric and metabolic surgery center.

CONCLUSION

In a 6-year period with a global follow-up of 80.44%, where the Petersen defect was not closed. An incidence of 4.44% was found, with an average follow-up of 31 (+/- 20.92) months. However, the percentage of Petersen's hernia may be underestimated since only those with symptoms that lead the patient to emergency care are usually diagnosed, so a high index of suspicion must always be had.

CONFLICTS OF INTEREST

All authors declare that they have no conflicts of interest.

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TABLES:

Tabla I

	Total	Hernia interna
Pacientes	225	10
Genero	Femenino 82.06% Masculino 17.93%	Mujer 100%
Edad (años)	37.20 (+/-9.55)	36.9 (+/-13.91)
Imc previo a la cirugia	44.76 (+/-8.36)	39.25 (+/-3.36)
Exceso de peso	66.08 (+/-24.32)	50.60(+/-11.80)

Tabla II

PACIENTE	FECHA DEL BYPASS	IMC 1	EXCESO DE PESO	TIEMPO DE PRESENTACION DE LA HERNIA. (Meses)	IMC 2	% DE EXCESO DE PESO PERDIDO	DIAS ESTANCIA HOSPITALARIA	COMPLICACIONES	TIPO DE CIRUGIA
I	2014	43.7	66.95	14	26.9	69.45	1	NINGUNA	URGENCIA
II	2015	38	46.4	50	25	71.98	1	NINGUNA	URGENCIA
II	2016	45.7	66	25	29.3	63.63	1	NINGUNA	URGENCIA
IV	2017	38.16	55.5	14	38	0.90	1	NINGUNA	URGENCIA
V	2017	36.8	42.05	35	26	63.02	1	NINGUNA	URGENCIA
VI	2017	38.8	49.45	19	23.7	80.88	1	NINGUNA	URGENCIA
VII	2018	42.13	63.3	4	33.8	38.70	1	NINGUNA	URGENCIA
VIII	2018	34.23	36.05	14	21.1	92.09	1	NINGUNA	URGENCIA
IX	2018	37.5	45.95	16	24.5	75.08	2	NINGUNA	URGENCIA
X	2019	36.8	31.4	22	28.23	67.83	1	NINGUNA	ELECTIVA

IMC 1: Previo cirugia Bypass
IMC 2: Previo cirugia hernia interna