Four cases of video-laparoscopic gastric bypass in patients with intestinal malrotation


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Introduction

Obesity is a universal disease, which is increasing in prevalence, and is becoming alarmingly epidemic. It is undoubtedly a major public health problem of modern society [1]. Due to lack of effectiveness of conservative treatments, bariatric surgeries currently represent the chosen treatment in cases of severe obesity, and the technique of laparoscopic gastroplasty with a Roux-en-Y gastrojejunal bypass (LRNY—GBP) is the most performed worldwide [2-14].

With an increasing number of bariatric surgeries, the chances for the surgeon to face unusual anatomical variations, such as intestinal malrotation, also increase[8] Thus, it is extremely important to have a good knowledge of this situation and the alternative proposals and tactics for the surgical procedure.

This congenital defect is caused by an incomplete or a no rotation of the intestine on the axis of the superior mesenteric artery during embryonic development [3]. About 90% of cases become clinically known in the first year after birth, however, some patients may remain asymptomatic throughout life[4]. This paper aims to present the case report of four patients who successfully underwent cases where this condition was discovered during a LRNY-GBP where intestinal malrotation was revealed at surgery.

Cases Report

All four patients in this study underwent LRNY-GBP. Patients 1, 2 and 3 were female and they were respectively 31, 27 and 29 years old. The first two patients had a BMI-40, while the third had a BMI-42.5. The fourth was a 20 year-old male patient with a BMI-44.79. During surgery, patients were placed supine, with the surgeon on the patient’s right and the first auxiliary surgeon on the left. After the creation of a pneumoperitoneum, five ports were inserted.

Gastroplasty was done as usual, with gastric division from the lesser curvature, forming a 50ml neo-stomach. However, during the identification of the jejunum, the right colon was observed in a middle location, and the fourth duodenal portion and small bowel loops in a right position, outside the foramen of the transverse mesocolon, non-existent in these cases, then confirming the diagnosis of intestinal malrotation. In patients 1, 2 and 3, the Ileo-Cecal valve was located, and in a retrograde motion, throughout the small bowel loops, we were able to identify the location where an end-to-side gastrojejunal anastomosis, 1m from the jejunoduodenal transition, was supposed to be done (Fig. 1).
Fig. 1. Identification of the duodeno jejunal transition
(A- Duodeno jejunal transition)

In patient 4, the jejunum were located immediately to the right of the colon and, similar to the other patients, we proceeded to the already referred anastomosis. For the gastrojejunal anastomosis, we used a 45mm linear blue stapler and extra mucosal continuous suture. The next step was the side-to-side jejuno jejunal anastomosis and the construction of a 1.5 to 2m long alimentary loop (Fig. 2).

Fig. 2.-"Jejuno-jejunal anastomosis" (Located in the right hemiabdomen)

In order to perform this, we used a 45mm linear stapler with white staples and an inverting extramucosal-seromuscular suture. Surgery was completed with the closure of "mesenteric defect or failure" and the performance of a test where the gastrojejunal anastomosis was submerged in saline solution at the same time that air was injected through an orogastric catheter. If any failure were detected, the correction would then be mandatory. All surgical steps were performed in the right hemiabdomen, as shown in the final phase of the surgery. (Fig. 3)

Fig. 3. Laparoscopic Final Appearance
(A- Intestinal Loop, B- Bilio–pancreatic Loop; C- Common Loop)

The patients had no postoperative complications, besides the expected weight loss, and all of them are in a clinical care follow-up.

Discussion

LRNYGBP was first described in 1993 by Wittgrove [9], and it is now considered the gold standard in the setting of bariatric surgery. According to the NIH (National Institutes of Health), and in compliance with the Brazilian Society of Metabolic and Bariatric Surgery, patients with BMI>40 or BMI>35 with associated co morbidity and an acceptable surgical risk, have surgical indication. In the United States, about 180,000 procedures have been performed each year [2,8,15,16] Sometimes unexpected situations happen, requiring the surgeon's experience to handle them safely. In the present study, we reported four cases of intestinal malrotation, an uncommon anomaly from the embryonic period. During the sixth week of fetal development, the midgut elongates and forms a U-shape intestinal loop that protrudes into the umbilical cord, forming the "physiological umbilical hernia". During this period, the midgut has a cephalic branch, which grows rapidly and forms the small bowel loops, and a caudal branch that will later result in a part of the large intestine. While it remains in the umbilical cord, the midgut rotates 90 degrees counterclockwise around the axis of the superior mesenteric artery (SMA); this moves the cephalic branch to the right and the caudal branch to the left. At 10 weeks, probably due to reduction of the liver and kidneys’ sizes and an increase of the abdominal cavity size, the return midgut to the abdomen occurs, process known as "hernia physiological reduction". The small intestine (formed by the cephalic branch) returns first, passing posterior to the SMA and occupying the central part of the abdomen. When the large intestine (formed by the caudal branch) returns, it undergoes an additional 180 degrees rotation in a counterclockwise direction, later occupying the right side of the abdomen. As the intestines increase and assume their final positions, their mesenteries are compressed against the posterior abdominal wall. In patients with intestinal malrotation, the midgut does not rotate when it returns to the abdomen. Consequently, the caudal branch returns to the abdominal cavity and the small intestine stays at the right side of the abdomen and the all large intestine stays at the left [3,11,12]. The intestinal malrotation actual incidence in the population is unknown, with incidence estimated...
range from 1:200 to 1:6000 [4,12]. It is known that 64% of cases become clinically evident during the first months of life and 82% until the end of the first year of life; some authors believe that this last percentage can reach 90% of cases [11]. The incidence of this anomaly in adults is 0.2%, and 15% of these patients with confirmed diagnosis of intestinal malrotation remain asymptomatic throughout life [4]. Among those who will develop some symptom, disease development can occur acutely or chronically. The acute form presents a scenario that includes vomiting and abdominal pain without distention progresses to intestinal ischemia and necrosis with peritonitis caused by volvulus or internal hernia. In cases of chronic disease, the symptoms are unspecific, such as an abdominal pain, cramp and recurrent vomits[4]. In the literature, 13 cases were reported in patients who underwent LRYGBP with intestinal malrotation, and in 12 of these, this condition was only discovered during surgery. In 11 cases the patients were successfully submitted to LRNY-GBP, whereas in the other two cases the surgery was converted to a laparotomy due to anatomical difficulties. In only one case, the postoperative period had a major complication, and another surgery had to be performed and with subsequent resolution of problem [5-13]. In the present study, we reported four cases of patients with intestinal malrotation discovered during LRNYGBP surgery, and yet the surgical procedure was performed successfully without postoperative complications. Some technical adjustments, however, were required by the time of jejunal loops identification, searching for them on the right side of the colon, or if not possible, seeking for them retrograde through the ileo cecal valve. In conclusion, patients with this anomaly can be successfully submitted to LRYGBP, underlining the importance of an adequate knowledge of such condition by the bariatric surgeons at the time of surgery. Then they will be able to make tactical adjustments pertinent to each case.

References
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