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Intraoperative iodinated contrast swallow with CT-scan delayed control for detection of early complications in laparoscopic gastric bypass: A case series of 260 cases☆

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ABSTRACT

Background: Laparoscopic Roux en Y Gastric Bypass (LRYGB) is a technically challenging operation with potentially severe surgical complications. A large number of tests have been proposed in order to early identify them in the immediate post-operative period but none was completely satisfactory. Actually, there is no data concerning the use of an early diagnostic protocol based on an intraoperative contrast swallow and a CT- scan at 48 h.

Methods and analysis: From may 2012 to February 2017, 281 patients underwent LRYGB. A 40 cc of iodinated water-soluble contrast (Gastrografin® or Telebrix®) was administered through the orogastric tube 5 min after the blue methylene test while 48 h later, they underwent a CT-scan. The early detection of the contrast liquid in the alimentary or bilio-pancreatic limb, in proximity of it or free in the abdomen were considered signs of bowel obstruction or anastomotic leak.

Results: 220 were test negative while 35 patients were positive and a second look was carried out successfully. Considering our data, sensitivity was 0,97 (CI 95% = 91,85–100%) while specificity stated at 0,98 (CI 95% = 96,48–99,95%). The positive predictive value was 0,89 (CI 95% = 80,22–99,27%) and the negative predictive value was 0,99 (CI 95% = 98,66–100%).

Conclusions: This study gives a contribute to the existing issue of fast track in bariatric surgery for the early diagnosis of complications and patients' readmission or non-discharge. In conclusion, the use of intraoperative iodinated water soluble contrast swallow and abdominal CT-scan at 48 h was a safe and accurate test in order to detect and treat any potential early surgical complication in LRYGB.

1. Background

Despite the worldwide rising number of sleeve gastrectomy, Roux en Y Gastric Bypass (RYGB) remains the gold standard procedure for morbid obesity [1]. It's usually performed with the laparoscopic approach due to its common benefits compared to open surgery [2,3]. Nevertheless, laparoscopic RYGB remains a technically challenging operation with potentially severe surgical complications as strictures, bowel obstructions, bleeding and anastomotic leaks [1–4]. Because of them, acute hospital readmission occurs in 3,3% of the cases according to the Danish cohort study [5]. A large number of tests have been proposed in order to early identify RYGB complications in the immediate post operative period [6,7] but none of them was completely satisfactory according to the vast majority of authors [8]. To the best of our knowledge, there is no data concerning the use of an early diagnostic tool or protocol based on an intraoperative contrast swallow and a CT-scan 48 h later. The main purpose of the test is to identify any modification of the bowel transit obstructing the passage of the contrast in the colon. The aim of this restrospective study is to

☆ This retrospective series includes 260 bariatric patients undergoing our surgical protocol after gastric bypass in the immediate perioperatory period. Results, sensitivity and specificity for detection of complications were analyzed in this group.

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evaluate the accuracy of our diagnostic method.

2. Methods and Analysis

From may 2012 to february 2017, 281 patients underwent laparoscopic gastric bypass (LRYGB) in our institute. The work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. A special informed consent was carefully read to all patients and signed.

Eligibility criteria for this study were the classical recommended indication of IFSO (International Federation for the surgery of Obesity) for LRYGB: Body mass index (BMI) > 40 or BMI > 35 associated to 1 or more co-morbidities as hypertension, OSAS(Obstructive sleep apnea syndrome), Gastro-esophageal reflux disease (GERD), hiatal hernia, type II diabetes, psychological disorders as snacking and sweat-eating. In order to avoid a selection bias, an homogeneous group was created by excluding all patients with delayed bowel transit (>48 h), demonstrated with an oro-anal transit study carried out routinely by our gastroenterologist before surgery. Also patients with immunological disease (CREST syndrome = Calcinosis, Reynold, Esophagitis, Sclerodattily, Teleangectasy) were excluded.

We obtained an homogeneous group of 260 patients with normal time of bowel transit and operated of gastric bypass in which the intraoperative contrast swallow test was carried out. See Table 1 for patients demographics.

In order to reduce the procedural bias, data of a single surgeon using the same technique were analysed. Description of bypass technique and protocol of the test are reported in this section.

2.1. Bypass procedure

Laparoscopic RYGB was performed according to a Lönroth modified technique [9]. 5 trocars were used to carry out all the procedures; a 5 mm trocar placed 2 cm under the right anterior axillary line was used for liver retraction; a 12 mm port on the median line was used for the optic (11 cm under the xiphoid appendix) while two other 12 mm trocars were placed about 8 cm laterally both for the right and left hand of the surgeon approximatively on the same horizontal line of the medial trocar. The last 5 mm trocar was placed on the left anterior axillary line, under the costal arch for the assistant.

Table 1
Patients demographics.

Patients	260
Gender Male	100 (38,46%)
Gender Female	160 (61,53%)
Mean age ± SD (range)	35 ± 15,3 (18–60)
Mean initial BMI ± SD (range)	42 ± 7,5 (32,8–57,6)
Mean initial weight ± SD (range)	113 ± 20,5 (83–180)

SD: standard deviation; BMI: Body mass index.

The angle of His was visualized after dissection of the left gastrophrenic ligament and Bertelli's membrane. A small gastric pouch (about 15 ml) was calibrated on a 36-French orogastric tube. The alimentary limb was prepared at 75 cm from Treitz and it was anastomosed with a 45 mm linear stapler (vascular). The gastrojejunal anastomosis hole was sutured with 3.0 atraumatic V-loc® or Stratafix® in a double seromuscular layer. The Peaterson's space was closed with a 2.0 non-absorbable suture (PDS). The biliary limb was divided from alimentary limb only after performing the anastomosis with the common limb measured at 150 cm from gastrojejunal anastomosis. Two 45 mm vascular load of the linear stapler were used in the jejunojejunal anastomosis. The jejunojejunal hole was sutured in the same way of the gastrojejunal. The mesenteric defect was equally closed. Blue methylene test was routinely performed to reveal any leak of both anastomoses before the division of the biliary limb. Only the fascial defect of the medial trocar was closed. Skin insicions were closed with intradermic sutures.

2.2. Protocol and rationale of the test

A separated consent was signed by all patients before surgery. A 40 cc of iodinated water-soluble contrast (Gastrografin® or Telebrix®) was administered through the orogastric tube 5 min after the blue methylene test. Patients were encouraged to drink at postoperative day 1, while the following day at 48 h of time from the operation, they underwent a CT-scan. The stagnation of the contrast liquid in the alimentary or biliopancreatic, in proximity of it or free in the abdomen were considered signs of bowel obstruction or anastomotic leak. Most of the time, occlusions occur because of an internal hernia, kinking, stenosis, trocar site hernia or massive adhesions; on the other side, leaks may be caused by technical errors, defect of healing (as in diabetic patients) or other causes. Furthermore, other sources of complications might be large a haematoma compressing the small bowel [10].

In all this cases, theoretically, the contrast couldn't completely reach the large intestine (Fig. 1).

In conclusion, we considered positive any test in which the contrast liquid wasn't fully passed in the colon in 48 h (Fig. 2).

2.3. Statistic

A complete statistic analysis was provided by the software

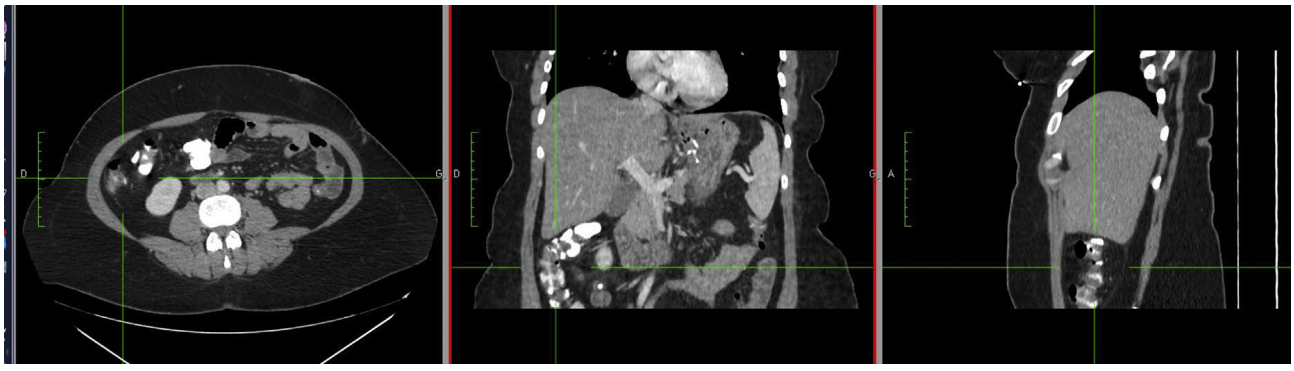

Fig. 1. Showing the complete passage of Gastrographin® in the colon.