

Routine Preoperative Ultrasonography and Selective Cholecystectomy in Laparoscopic Roux-en-Y Gastric Bypass. Why Not?

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Received: 18 May 2007 / Accepted: 27 September 2007 / Published online: 15 December 2007
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Abstract

Background Preoperative evaluation and treatment of biliary lithiasis in morbid obese patients who are candidates to bariatric surgery raise a series of questions which to date has no clear consensus. The aim of this study was to evaluate the results of routine preoperative abdominal ultrasonography and selective cholecystectomy comparing patients who underwent laparoscopic Roux-en-Y gastric bypass (RYGBP) with and without simultaneous cholecystectomy.

Methods The prospective database of all the patients who underwent laparoscopic RYGBP in our institution was reviewed. The demographic characteristics, comorbidities, operative time, hospital stay, and postoperative complications were analyzed.

Results From August 2001 to December 2006, 1,311 patients underwent laparoscopic RYGBP, 137 (10.4%) of them were excluded due to previous cholecystectomy. In 128 (10.9%) of the remaining 1,174 patients, a cholecystectomy associated to laparoscopic RYGBP was performed. The mean age was 38.5 ± 10.1 years, and 106 (82.8%) were women. The mean operative time in patients with and without simultaneous cholecystectomy was 129.8 ± 45 and 108.5 ± 43 min, respectively ($p < 0.001$). The hospital stay was 3.6 ± 0.8 days in patients with simultaneous cholecystectomy and 4 ± 3 days in patients without simultaneous cholecystectomy ($p = 0.003$). There were no deaths.

Postoperative complications were observed in 9 (7%) and 73 (6.9%) patients with and without simultaneous cholecystectomy respectively ($p = \text{NS}$). Postoperative complications were not related to the cholecystectomy.

Conclusion Cholecystectomy associated to laparoscopic RYGBP should be considered in all patients with preoperative ultrasound diagnosis of cholelithiasis.

Keywords Morbid obesity · Gastric bypass · Cholecystectomy · Gallstones

Introduction

Obesity and weight loss in medical treatments, and more so after surgery, are factors that are related to the development of gallbladder stones [1–3]. The evaluation of patients for bariatric surgery and its follow-up during the weight loss period raise a series of questions related to the study, treatment, and prevention of biliary lithiasis which, to date, has no clear consensus.

Among the patients who underwent bariatric surgery, 21 to 23% has previous cholecystectomy and 14 to 21% cholelithiasis at the time of surgery [4–6]. In the first 12 to 24 months after bariatric surgery, up to 50% of the patients develop gallbladder stones, and most of them are asymptomatic [7]. With the purpose of avoiding complications associated to biliary stones, routine cholecystectomy was proposed in all patients who underwent open Roux-en-Y gastric bypass (RYGBP) [8–11]. The advantages of laparoscopic surgery have made it the alternative of choice in obese patients; however, its technical complexity makes a routine cholecystectomy difficult [5, 12]. In this sense, there are those who suggest that the presence of calculus in

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the gallbladder should not be evaluated routinely in asymptomatic patients [13].

The anatomic changes of RYGBP hinder the routine endoscopic evaluation and treatment of the bile duct through endoscopic retrograde cholangiopancreatography (ERCP). Choledocholithiasis, acute cholangitis, and acute pancreatitis are complications of gallbladder stones, which many times require an ERCP as a therapeutic procedure. The transgastric or retrograde ERCP through the alimentary limb has been described; however, its implementation is complex, risky, and at times frustrating [14, 15].

The aim of this study was to evaluate the clinical results of the routine preoperative ultrasound evaluation and selective cholecystectomy, comparing the surgical results of patients who underwent a LRYGBP with and without simultaneous cholecystectomy.

Material and Methods

The prospective database of all the patients who underwent laparoscopic RYGBP in our institution from August 2001 to December 2006 was reviewed. All the patients were evaluated by a multidisciplinary team and met criteria for surgical treatment of morbid obesity according to the Surgical Management of the Obese Patient Standards of the Chilean Ministry of Health and National Institutes of Health Consensus Development Panel [16, 17]. This preoperative evaluation includes a routine abdominal ultrasonography. All the patients signed a consent form to undergo surgery. The demographic characteristics, comorbidities, operating time, hospital stay, and postoperative complications (<30 days) were analyzed. The patients with previous cholecystectomy were excluded from the analysis.

Surgical Procedure

LRYGBP performed using five ports as is shown in the Fig. 1. All patients were operated constructing a 10–15 cc gastric pouch, with a complete stomach section and a 150–200 cm alimentary limb. A hand-sewn double layer 11-mm gastrojejunostomy was performed using running absorbable suture (Vicryl 3-0 Johnson & Johnson, Brazil). Cholecystectomy was usually performed after LRYGBP procedure using the same ports. A sixth port was sometimes necessary. The gallbladder was removed in a bag (Endobag, Tyco/Healthcare USS. Norwalk, CT) through the left lower incision.

Statistical Analysis

Differences were evaluated using the χ^2 or Fisher's exact test for categorical variables and Student's *t* test for

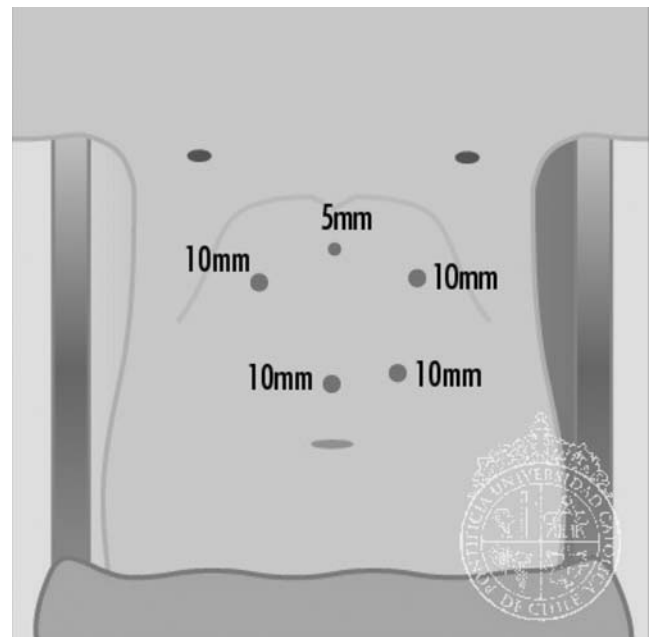


Fig. 1 Port placement in laparoscopic Roux-en-Y gastric bypass

continuous variables. *P* value < 0.05 was considered statistically significant.

Results

From August 2001 to December 2006, 1,311 patients underwent laparoscopic RYGBP. One hundred and thirty-seven patients (10.4%) were excluded from this study because of previous cholecystectomy. In 128 (10.9%) of the remaining 1,174 patients, a cholecystectomy associated to laparoscopic RYGBP was performed. The mean age was 38.5 ± 10.1 years, and 106 (82.8%) were women. The mean preoperative body mass index (BMI) was 41.7 ± 6 kg/m². The preoperative ultrasound diagnosis was cholelithiasis and gallbladder polyp in 125 (97.6%) and three (2.3%) patients, respectively. One patient with a preoperative diagnosis of asymptomatic cholelithiasis did not undergo

Table 1 Baseline characteristics of patients

	LRYGBP with cholecystectomy (<i>N</i> =128)	LRYGBP without cholecystectomy (<i>N</i> =046)	<i>p</i> value
Age (years \pm SD)	38.5 \pm 10.1	36.3 \pm 10.7	0.02
Female sex – <i>n</i> (%)	106 (82.8)	759 (72.5)	0.01
BMI (kg/m ² \pm SD)	41.6 \pm 5.9	40.4 \pm 5.09	<0.001
DM II – <i>n</i> (%)	17 (13.2)	104 (9.9)	0.27
HTN – <i>n</i> (%)	45 (35.1)	235 (22.4)	0.002

Table 2 Surgical results in patients with and without cholecystectomy concomitant to laparoscopic RYGBP

	LRYGBP with cholecystectomy 128	LRYGBP without cholecystectomy 1028	<i>p</i> value
Operative time (min±SD)	129.8±45.4	108.5±42.9	<0.001
Hospital stay (days±SD)	3.6±0.8	4.01±3.2	0.2
Conversion to open surgery – <i>n</i> (%)	3 (2.3)	10 (0.97)	0.1
Postoperative complications – <i>n</i> (%)	9 (7.0)	73 (7.1)	0.5
Reoperation – <i>n</i> (%)	4 (3.1)	21 (2.04)	0.51

cholecystectomy at LRYGBP because of the complexity of the procedure and prolonged operating time. This patient was operated 4 months later due to an acute cholecystitis.

The mean age and mean preoperative BMI was higher in patients who underwent cholecystectomy associated to RYGBP compared to patients who only underwent RYGBP (Table 1). The rate of female patients as well as patients with hypertension was greater in patients with associated cholecystectomy (Tables 1 and 2).

The mean operative time in patients with and without simultaneous cholecystectomy was 129.8±45 and 108.5±43 min, respectively ($p<0.001$). The hospital stay was 3.6±0.8 days in patients with simultaneous cholecystectomy and 4±3 days in patients without simultaneous cholecystectomy ($p=0.003$). Conversion to open surgery was necessary in

Table 3 Postoperative complications (<30 days) in patients with and without cholecystectomy concomitant to laparoscopic RYGBP

	LRYGBP with cholecystectomy 128	LRYGBP without cholecystectomy 1028
Gastrojejunostomy/ pouch leak	1 (0.78)	14 (1.4)
Gastrojejunostomy stenosis	3 (2.3)	17 (1.7)
Intraabdominal bleeding	1 (0.78)	2 (0.2)
Gastrointestinal bleeding	0	10 (0.97)
Intestinal obstruction	2 (1.56)	12 (1.16)
Intraabdominal abscess	1 (0.78)	4 (0.4)
Wound infection	1 (0.78)	4 (0.4)
Pneumonia/ atelectasis	0	4 (0.4)
DVT/VTE	0	6 (0.6)

DVT/VTE Deep vein thrombosis/Venous thromboembolism.

three (2.5%) patients with simultaneous cholecystectomy and in ten (1.2%) patients of the other group ($p=NS$). In no patient was conversion related to the cholecystectomy. There were no deaths. Postoperative complications were observed in nine (7%) and 73 (6.9%) patients with and without simultaneous cholecystectomy, respectively ($p=NS$). Postoperative complications were not related to the cholecystectomy (Table 3).

Discussion

The evaluation, treatment, and follow-up of patients who are candidates for surgery for morbid obesity raise a series of unresolved and controversial questions in relation to the presence or development of biliary lithiasis [18]. This is especially important in procedures such as RYGBP where the anatomical changes resulting from the surgery hinder the endoscopic evaluation and treatment of the bile duct through ERCP. Transgastric or retrograde ERCP through the alimentary limb has been described in these patients. However, its implementation is extremely complex and frequently fruitless [14, 15]. The cholecystectomy in lithiasic patients decreases this risk and, therefore, the need for endoscopic evaluation and treatment of the bile duct [19–22].

The first proposal is the routine preoperative evaluation of biliary lithiasis. Of the patients at risk, 15 to 20% have cholelithiasis in the preoperative evaluation, and more than 90% of them are asymptomatic. This means that preoperative ultrasonography indicated only in patients with suspected gallbladder stones; the diagnosis could be missed in most of them.

The transabdominal ultrasound evaluation in obese patients has a lower accuracy for the diagnosis of cholelithiasis compared to the general population. The finding of cholelithiasis with a normal preoperative ultrasound is described in up to 6% of patients in open surgery [10, 23]. It could be explained by hydrops of the gallbladder and microlithiasis [23]. This lower accuracy and the feasibility of the simultaneous cholecystectomy in open GBP with a low morbidity resulted in the proposal by many surgeons of a routine cholecystectomy in all patients who underwent open RYGBP even without a preoperative ultrasound evaluation [10, 11]. These studies report an incidence of gallbladder abnormality in up to 80% of patients who underwent a routine cholecystectomy. However, this rate also considers alterations such as chronic alithiasic cholecystitis and gallbladder cholesterosis with debatable clinical relevance.

The complexity of laparoscopic surgery has redefined this situation. Laparoscopic cholecystectomy is a safe and effective alternative among obese patients [24]. However,

overweight and obesity increases the risk of conversion in laparoscopic cholecystectomy [25, 26]. Hamad et al. [5] describe a greater operating time and surprisingly a longer hospital stay without an increase in the postoperative complications in patients with simultaneous cholecystectomy to RYGBP. According to the authors, the inclusion of patients from the learning curve could explain a longer operating time, greater postoperative discomforts, and a longer hospital stay. In this series, the effect of the learning curve could have been attenuated because of the large number of patients. The operating time increased by only 21 min, and a greater morbidity or prolonged hospital stay in patients with simultaneous cholecystectomy, was not observed. The causes of conversion and postoperative complications were not related to the cholecystectomy. These results are even more significant if we consider that this group of patients were older, had a greater preoperative BMI, and a greater proportion of male patients, all predictive factors of morbidity and mortality after laparoscopic RYGBP [27].

Selective cholecystectomy associated to laparoscopic RYGBP requires the ultrasound evaluation of the gallbladder. The most common evaluation used is the preoperative transabdominal ultrasound. Perhaps, a more sensitive alternative in obese patients is the intraoperative ultrasound; however, its implementation is more complex, not widely available, and requires a trained surgeon.

Another important element in patients with gallbladder stones is predictive factors of common bile duct stones. The dilation of the bile duct as measured by a preoperative ultrasound is important in the prediction of choledocholithiasis [28]. Its preoperative evaluation permits the assessment of conventional treatment alternatives and avoids the implementation of endoscopic alternatives which are much more complex once the RYGBP has been performed. The intraoperative finding of choledocholithiasis associated to cholelithiasis raises serious therapeutic limitations that could be eventually prevented by a preoperative ultrasound.

In conclusion, cholecystectomy associated to laparoscopic RYGBP in patients with gallbladder stones does not increase the conversion rate to open surgery, the postoperative morbidity, nor the hospital stay, and therefore, should be considered in all patients with preoperative ultrasound diagnosis of cholelithiasis.

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