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# Management of biliary symptoms after bariatric surgery



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## KEYWORDS:

Biliary system;  
Bariatric surgery;  
Cholelithiasis;  
Endoscopic retrograde  
cholangiopancreatography

## Abstract

**BACKGROUND:** Biliary disease requiring intervention can be complicated in the postbariatric surgery patient.

**METHODS:** A retrospective review was completed to identify patients who underwent laparoscopic Roux-en-Y gastric bypass or laparoscopic sleeve gastrectomy from September 2001 to September 2014, and those who underwent biliary intervention were identified.

**RESULTS:** A total of 1527 patients underwent bariatric surgery during the study period. Of the 1,112 patients without prior cholecystectomy, 91 (8%) had biliary symptoms requiring intervention. Ninety patients underwent cholecystectomy, with 86 successfully completed laparoscopically. Six patients required laparoscopy-assisted percutaneous transgastric endoscopic retrograde cholangiopancreatography along with cholecystectomy to clear gallstones from the common bile duct. Three patients who had undergone cholecystectomy before bariatric surgery developed primary common bile duct stones.

**CONCLUSIONS:** Surgery for biliary disease after bariatric surgery can be completed successfully with minimal complications, and percutaneous transgastric endoscopic retrograde cholangiopancreatography has a high success rate of access to and clearance of the biliary tree.

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Bariatric surgery is one of the most commonly performed elective general surgery operations in the United States.<sup>1</sup> Some bariatric surgeries, such as laparoscopic Roux-en-Y gastric bypass (LRYGB), alter the foregut and midgut anatomy to aid in long-term weight loss.<sup>2</sup> As obese patients have a higher incidence of biliary disease, previous bariatric surgery may complicate treatment. The incidence

of asymptomatic cholelithiasis in the general population found by transabdominal ultrasonography ranges from 2% to 15%.<sup>2</sup> Risk factors have been identified and include obesity, female sex, age more than 40 years, white ethnicity, premenopausal state, pregnancy, use of oral contraceptives, estrogen replacement therapy, diabetes, and family history. An additional risk factor includes rapid changes in weight, either gain or loss, such as is seen in bariatric surgery.<sup>3</sup>

Prevention of biliary complications with ursodiol has been studied previously by Sugerma et al<sup>4</sup> in a prospective, double-blinded, randomized controlled trial which showed that the use of ursodiol postoperatively can prevent

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gallstone formation. If cholelithiasis does occur postoperatively and complications of those stones occur, treatment is variable. Treatment for symptomatic cholelithiasis includes laparoscopic cholecystectomy with or without cholangiography to evaluate the biliary anatomy. If choledocholithiasis is found, it may be treated with laparoscopic transcystic common bile exploration at the time of cholecystectomy. If a patient presents with choledocholithiasis after LRYGB, then traditional endoscopic retrograde cholangiopancreatography (ERCP) and clearance of the common bile duct (CBD) are more difficult because of the altered anatomy.<sup>2</sup>

The objective of this study was to review our institution's longitudinal experience with bariatric surgery patients who required biliary interventions postoperatively.

## Methods

A retrospective review of our institution's prospective bariatric surgery registry was completed to identify patients who underwent LRYGB or laparoscopic sleeve gastrectomy (LSG) from September 2001 to September 2014. Past surgical history was reviewed for cholecystectomy before LRYGB or LSG. A query of our institution's electronic medical record system was completed to identify patients who underwent cholecystectomy or ERCP after bariatric surgery. If patients reported undergoing cholecystectomy at an outside hospital, it was documented in our bariatric surgery registry. The presence of any CBD stones and any additional interventions to clear CBD stones were noted, as were any postoperative or postprocedure complications.

The surgical technique for LRYGB was standardized between the 3 bariatric surgeons and has been previously described in detail.<sup>5</sup> Surgical technique for LSG varied slightly among the surgeons with a 36F to 38F Maloney bougie used for sizing the sleeve. The greater omentum is sutured to the staple line at the surgeon's discretion. Our protocol is to only perform concomitant cholecystectomy at the time of bariatric surgery if the patient has imaging and symptoms consistent with biliary disease.

## Results

A total of 1,527 patients underwent bariatric surgery at our institution during the study period. Of these, 1,366 underwent LRYGB, and 161 underwent LSG. The average age of patients who underwent LRYGB was 44.4 years (range, 18 to 69 years). Patients who underwent LSG were slightly older, with a mean age of 46.2 years (range, 21 to 67 years). Both LRYGB and LSG groups were composed of 19% males. Mean initial body mass index (BMI) of patients who underwent LRYGB and LSG was 47.98 kg/m<sup>2</sup> and 45.33 kg/m<sup>2</sup>, respectively. Mean excess BMI loss at 1 year was higher for LRYGB patients than LSG patients with 66.4% (range, 10.7% to 133.5%) and 63.7% (range, 24.3% to 107.7%), respectively.

There were 415 patients (30%) with a history of cholecystectomy before bariatric surgery; 380 before LRYGB and 35 before LSG. Of the 380 patients in the LRYGB group with a previous cholecystectomy, 65 of the cholecystectomies were completed as open surgeries with the remainder completed laparoscopically. Three of the 380 patients required laparoscopy-assisted ERCP after LRYGB to clear the CBD of stones. Of the 35 patients undergoing LSG with previous cholecystectomy, 5 were performed via an open approach. No patient in this group had a history of ERCP (Fig. 1).

One cholecystectomy was completed at the time of LRYGB. Ninety-one patients (8%) of the 1,112 without prior cholecystectomy had biliary symptoms requiring intervention after their bariatric surgery: 2 patients after LSG (1.6%) and 89 patients after LRYGB (9.0%; Fig. 2). All but 2 of the patients underwent intraoperative cholangiography to evaluate the biliary system at the time of cholecystectomy. Of the 89 LRYGB patients, 84 were successfully completed laparoscopically. One patient underwent percutaneous cholecystostomy tube placement for cholecystitis while undergoing end-of-life care for metastatic bladder cancer. In 4 patients, open cholecystectomies were completed successfully. The 1st was performed in 2004 as a planned open procedure during an exploratory laparotomy for ischemic bowel secondary to arterial embolus. Two patients were converted to open cholecystectomies with CBD explorations when intraoperative cholangiography revealed large CBD stones that were not conducive to ERCP or laparoscopic transcystic CBD exploration. One of these 2 patients had a preoperative diagnosis of choledocholithiasis; the other was diagnosed at the time of intraoperative cholangiography. The final conversion to open cholecystectomy occurred in a patient with perforated emphysematous cholecystitis with liver abscess. Cholecystectomies performed in the 2 patients who underwent LSG were completed laparoscopically and required no interventions to the CBD.

In the 90 patients who underwent cholecystectomy, the surgical indications varied from biliary colic or dyskinesia ( $n = 59$ ), cholecystitis ( $n = 15$ ), choledocholithiasis ( $n = 6$ ), and biliary pancreatitis ( $n = 7$ ). The surgical indication for cholecystectomy could not be found in the medical record for 3 patients. The overall incidence of cholecystectomy for biliary colic or dyskinesia was 3.86%, .98% for cholecystitis, .39% for choledocholithiasis, and .46% for biliary pancreatitis in the postoperative period.

Of the 88 cholecystectomies performed on patients after LRYGB, 6 patients required laparoscopy-assisted percutaneous transgastric ERCP to clear gallstones from the CBD, with a 100% success rate of clearing the CBD. Only 3 of these patients were diagnosed with choledocholithiasis preoperatively. In some of these cases, the on-call gastroenterologists were made aware of the possible need for laparoscopy-assisted ERCP preoperatively allowing for 4 of these to be performed concomitantly with cholecystectomy. The other 2 were completed on postoperative days 2 and 6 after laparoscopic cholecystectomy.

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