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Original article

How frequently and when do patients undergo cholecystectomy after bariatric surgery?

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Abstract

Background: Rapid weight loss after bariatric surgery is associated with gallstone formation, and cholecystectomy is required in up to 15% of patients. Prophylactic cholecystectomy or prophylactic ursodiol administration in the postoperative period have been suggested to address this problem. The objectives of this study were to investigate the frequency and timing of cholecystectomies after bariatric surgery and to determine the associated risk factors in patients who underwent laparoscopic Roux-en-Y gastric bypass (LRYGB), laparoscopic adjustable gastric band (LAGB), or laparoscopic sleeve gastrectomy (LSG).

Methods: Data prospectively collected in an institutional database were analyzed. Differences among the 3 procedures and the effects of ursodiol administration, patient demographic characteristics, postoperative weight loss, and individual surgeon practices on cholecystectomy rates were examined. Survival analysis and proportional hazard models were used.

Results: Of 1398 patients, 109 (7.8%) underwent cholecystectomy with a median follow-up of 49 (range 12–103) months. Cholecystectomy frequency was 10.6% after LRYGB, significantly higher than 2.9% after LAGB ($P < .001$), and 3.5% after LSG ($P = .004$). The frequency was highest within the first 6 months (3.7%), but declined over time to <1% per year after 3 years. Ursodiol administration did not affect cholecystectomy rates ($P = .97$), and significant intersurgeon variability was noted. Excess weight loss (EWL) >25% within the first 3 months was the strongest predictor of postoperative cholecystectomy ($P < .001$). Cox hazards model revealed 1.25 odds ratio per 10% EWL within 3 months, and odds ratio .77 per decade of life. In addition, white patients had 1.45 times higher cholecystectomy rates than did black patients. Preoperative body mass index, gender, and surgeon did not affect cholecystectomy rates.

Conclusion: Bariatric surgery is associated with a low frequency of postoperative cholecystectomy, which is highest early after surgery and mainly determined by the amount of EWL within the first 3 months. The results of the present study do not support routine prophylactic cholecystectomy at the time of bariatric surgery in asymptomatic patients. (Surg Obes Relat Dis 2014;10:313-321.)

Keywords: Cholecystectomy; Cholelithiasis; Bariatric surgery; Roux-en-Y gastric bypass; Sleeve gastrectomy

Gallstone disease is prevalent in patients after bariatric surgery [1,2]. Rapid weight loss is a well-established risk factor for cholelithiasis [3–5]. Promoting factors include elevated cholesterol concentration in bile, the increased

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secretion of calcium and mucin into bile during rapid weight loss, and the increased concentration of arachidonic acid derivatives [6–8]. In addition, obesity itself is a cholecystokinin-resistant state, resulting in a reduction in bile flow. Furthermore, fasting and stringent dietary restriction are also associated with bile stasis [9]. Other factors that may contribute to gallstone development are division of the hepatic branch of the vagus nerve during gastric pouch formation and reduction in cholecystokinin levels due to food stream diversion [6]. Although these factors increase the frequency of gallstones after weight loss surgery to 30%–52.8%, only 7%–15% of patients after bariatric surgery become symptomatic requiring cholecystectomy [4,10].

There has been considerable debate among bariatric surgeons about whether routine cholecystectomy should be performed at the time of the weight loss procedure. Prophylactic cholecystectomy prevents the morbidity of symptomatic cholelithiasis, eliminates the diagnostic dilemma of atypical symptoms often present in the postoperative period, and avoids the risk of common duct stones, for which treatment can be particularly challenging after a Roux-en-Y bypass (RYGB) [10–13]. Opponents argue that despite the increased prevalence of gallstones in obese patients after bariatric surgery, the rates of cholecystectomy remain under 15% in most large studies [14–16]. In addition, they argue that routine cholecystectomy at the time of bariatric surgery is associated with prolonged hospital stay, longer operating time, and potentially higher complication rates [17,18]. Furthermore, the use of ursodiol after weight loss surgery has been shown to drastically decrease the frequency of gallstone formation [19].

While the best management option is still debated, in the past decade there has been a shift away from routine prophylactic cholecystectomy [18]. Some attribute this trend to the prevalence of laparoscopic bariatric procedures that leave minimal postoperative abdominal adhesions so that subsequent cholecystectomy, when necessary, is much less difficult than cholecystectomy after open bariatric surgical procedures.

The objectives of the present study were to examine the time of cholecystectomy after bariatric surgery, assess potential differences in cholecystectomy rates among common bariatric procedures, and identify predisposing factors for the development of gallbladder disease after bariatric surgery.

Methods

The study was approved by the Institutional Review Board of the Carolinas Health Care System. Demographic, perioperative, and postoperative data of patients undergoing laparoscopic Roux-en-Y gastric bypass (LRYGB), laparoscopic sleeve gastrectomy (LSG), or laparoscopic adjustable gastric banding (LAGB), between 2004 and 2012 at a bariatric center of excellence, were prospectively entered into a database. To be included in this analysis, patients had to have at least 12 months' follow up after surgery. All procedures were performed by 1 of 3 bariatric surgeons with fellowship training in minimally invasive bariatric surgery, and most included a minimally invasive bariatric fellow or a general surgery resident. During their initial history and physical, all patients were assessed for gallbladder symptoms and signs. Gallbladder imaging was obtained selectively in patients with clinical suspicion for gallbladder disease and consisted of a right upper quadrant ultrasound and/or a hepatobiliary iminodiacetic acid (HIDA) scan as indicated. No imaging was pursued if patients were asymptomatic and had never before experienced gallbladder-related symptoms. Patients with preoperative symptoms and findings of gallbladder disease underwent prophylactic cholecystectomy at the time of bariatric surgery. This group of patients and those with history of prior cholecystectomy were excluded from subsequent analysis. Patients were placed on a standardized high protein liquid diet 2 weeks before surgery and advanced gradually to a regular diet within a month after surgery. Protein intake in the postoperative period was emphasized to minimize protein malnutrition (goal of at least 60 g/d). After surgery, patients were seen in the office at 2 and 6 weeks, 3, 6, and 12 months, and yearly thereafter or at shorter intervals if needed. At each visit, patients were asked if they were experiencing symptoms of gallbladder disease, and diagnostic imaging was pursued if indicated. Patients with clear symptoms and findings of gallbladder disease underwent laparoscopic cholecystectomy by one of our bariatric surgeons. Patients who underwent cholecystectomy at another facility were identified, and the operative findings and pathology results were acquired, reviewed, and included in this analysis.

After initial bariatric surgery, one of the surgeons routinely placed his patients who still had their gallbladders on ursodiol 300 mg twice daily for 3–6 months the second started routine ursodiol administration in 2008 (but had not before that), and the third did not place his patients on ursodiol. All 3 surgeons used a similar technique for LAGB placement (pars flaccida) and sleeve gastrectomy (36–40 Fr bougie). For laparoscopic gastric bypass, 2 surgeons used a 25-mm circular stapling technique and 1 surgeon used a linear stapling technique for the creation of the gastrojejunostomy. The hepatic branch of the vagus was preserved by all surgeons.

The timing of cholecystectomy after bariatric surgery was recorded, and its frequency after each procedure calculated. The relationship among patient demographic characteristics, type of bariatric procedure, weight loss achieved at the time of cholecystectomy, use of ursodiol postoperatively, bariatric surgeon, and need for cholecystectomy was examined. Patient weight was analyzed as percentage of excess weight loss (%EWL); excess weight was defined as the weight on