

## Management of Gallstone in Obesity Surgery– A Review

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### Abstract

### Review Article

Gall stones are more common in the obese population and may be formed during rapid weight loss. The ideal management of gallstones in obese patients undergoing bariatric surgery remains unclear. Several treatment modalities have been used by many surgeons and include performing cholecystectomy on all patients at the time of gastric bypass, performing cholecystectomy only when patients having symptoms of gallstones. All kinds of treatment modalities have been analyzed and discussed in this study.

**Keywords:** Obesity, Gallstone, Cholecystectomy.

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## INTRODUCTION

Rapid weight loss after bariatric surgery is one of many known risk factors for gallstone development, along with age, female gender, parity, race, obesity, genetics, very-low-calorie diets, short bowel syndrome, gallbladder motor dysfunction, diabetes, drugs and gastrointestinal surgery, among many others. The incidence of cholelithiasis has been reported to be 5% in the general population, while it is significantly increased in obese population reaching 45%. In the Arab region, 66%-75% of adults and 25%-40% of children are either overweight or obese. After bariatric surgery, weight loss of more than 25% of the original weight is considered to be the only predictive factor to postoperative gallstone formation. The incidence of gallstone formation differs between the various types of bariatric procedures. Asymptomatic gallstones are reported in 26.5% in gastric banding patients, though only 6.8% of patients become symptomatic postoperatively. In addition, asymptomatic gallstones ranged from 30 to 52.8% after 6 to 12 months postoperatively, whilst symptomatic gallstones occurred by 7–16% in gastric Roux-en-Y by pass (RYGB) patients. Despite that, cholecystectomy after RYGB was necessary only for 3.9–17.6% of the patients whether or not stones were present before bariatric surgery. Laparoscopic cholecystectomy (LC) in bariatric patients may be technically challenging due to suboptimal port placement and difficult body habitus. Furthermore, it is accompanied by potential risks such as lengthening of operative time, increased morbidity, and prolonged

hospitalization. Serious complications have been reported as high as 2% to 3% of cases [1].

## METHODOLOGY

We conducted a literature article search using PubMed and hospital library database. We identified studies conducted during last 18-20 years. This review article will give further clarity on the way the gall stone can be managed in patients undergoing bariatric surgery.

### Risk factors for gallstones

The number of bariatric interventions for morbid obesity is increasing worldwide. Rapid weight loss is a major risk factor for gallstone development. Approximately 11 % of patients who underwent Roux-en-Y gastric bypass develop symptomatic gallstone disease. Gallstone disease can lead to severe complications and often requires hospitalization and surgery. Rapid weight loss after bariatric surgery is one of many known risk factors for gallstone development, along with age, female gender, parity, race, obesity, genetics, very-low-calorie diets, short bowel syndrome, gallbladder motor dysfunction, diabetes, drugs and gastrointestinal surgery, among many others. Traditionally cholecystectomy was indicated only in the presence of both gallstones and symptoms, but recently some have advocated elective cholecystectomy in selected cases in the absence of symptoms and even in the absence of gallstones. Sustained weight loss after gastric bypass is achieved by a combination of gastric restriction and a variable degree of malabsorption and

has therefore a greater risk for gallstone development than purely restrictive procedures like adjustable gastric banding. The appropriate management of gallstones and gallbladder disease in these patients is still under debate and several therapeutic modalities are used, including simultaneous cholecystectomy to all patients at the time of gastric bypass, regardless of the presence or absence of gallstones and/or symptoms (prophylactic approach), simultaneous cholecystectomy only to patients with gallstones (elective or selective approach) and expectant management with or without the prophylactic administration of ursodeoxycholic acid (UDCA) until symptoms develop [2].

### Treatment

Several therapeutic modalities are used and include performing cholecystectomy on all patients at the time of gastric bypass, performing concomitant cholecystectomy only when patients have gallstones and performing cholecystectomy only in the presence of both symptoms and gallstones. Some groups administer ursodeoxycholic acid for gallstone prevention in the postoperative period. Ursodeoxycholic acid (UDCA) prevents the formation of gallstones after bariatric surgery. However, randomized controlled trials with symptomatic gallstone disease as primary endpoint have not been conducted. Currently, major guidelines make no definite statement about postoperative UDCA prophylaxis and most bariatric centers do not prescribe UDCA. A randomized, placebo-controlled, double-blind multicenter trial was conducted on 980 patients shows The UPGRADE trial will answer the question whether UDCA reduces the incidence of symptomatic gallstone disease after Roux-en-Y gastric bypass or sleeve gastrectomy. Furthermore it will determine if treatment with UDCA is cost-effective [3].

Prophylactic administration of ursodeoxycholic acid (UDCA), an oral bile acid, can prevent the formation of gallstones after bariatric surgery by reducing bile lithogenicity. However, little evidence is available regarding the efficacy of UDCA in preventing symptomatic gallstone disease [4-6].

According to a study by Edward E Mason et al., there had been an increase in concurrent cholecystectomy due to a shift from simple gastric restrictive operations to gastric bypass with gastric restriction. When the most extensive bypass of intestine is used, as in distal Roux-en-Y gastric bypass (RYGBP-X) or biliopancreatic diversion with a duodenal switch (BPD-DS), all patients were reported to have undergone cholecystectomy. Only 30% of surgeons performing standard Roux-en-Y gastric bypass (RYGBP) remove normal-appearing gallbladders. Ursodeoxycholic acid is used to prevent gallstone formation in one-third of patients when a normal-appearing gallbladder is left in place. Prophylactic cholecystectomy is left to the discretion of the surgeon when RYGBP is used. There has been an increase in cholecystectomy and

malabsorptive operations during the last 15 years. When most of the small bowel is bypassed, gallbladders were removed. For patients with simple restriction operations, normal-appearing gallbladders are usually left in place. Urso-deoxycholic acid during rapid weight loss for prevention of gallstone formation is used in one-third of patients with remaining gallbladders [7].

According to a study by Joseph A Caruana *et al.*, a total of 100 females and 25 males were studied. Follow-up extended from 16 to 48 months. Symptomatic gallstones requiring cholecystectomy developed in 10 patients, all females. Laparoscopic cholecystectomy was performed in 9 of these patients and open cholecystectomy was performed in the remaining patient, between 3 and 21 months after bypass. There were no serious complications from the stones or the cholecystectomy. Prophylactic cholecystectomy would have been unnecessary in 115 of the 125 patients in the study group. A 6-month course of ursodiol for all 125 patients, at a cost of 56,250 dollars, would have had to decrease the number of cholecystectomies from 10 to 3 to demonstrate a treatment effect ( $P < .05$ ). Therefore, most newly formed gallstones after gastric bypass are likely asymptomatic, prophylactic cholecystectomy is not indicated, and ursodiol therapy may be better reserved for symptomatic patients who refuse surgery [8].

According to a study by Daniel E Swartz *et al.*, a total of 692 primary Roux-en-Y gastric bypass procedures were performed, of which 661 (95.5%) were completed laparoscopically. Complete data were collected on 417 patients (60.3%). A total of 98 patients (23.5%) had had prior or concomitant cholecystectomy and were excluded from additional study. Of the remaining 319 patients, 47 (14.7%) required subsequent cholecystectomy and 272 (85.3%) did not. The risk of subsequent cholecystectomy correlated inversely with the duration of ursodiol prophylaxis. All pathologic specimens had cholecystitis but gallstones were present in only 48.8%. Two complications (abscess and port-site bleed) occurred, but no common duct stones developed and no patient died. The mean follow-up was 7.5 months (range 13-25). Asymptomatic gallstones in bariatric patients may be treated safely with secondary cholecystectomy. After a 6-month regimen of ursodiol prophylaxis, 14.7% will require subsequent cholecystectomy. Asymptomatic gallstones in the bariatric patient may be safely managed identically to those in the nonobese population [9].

According to meta-analysis by Francisco Tustumi *et al.*, the incidence rate of biliary complications was 5.54 cases/1000 patient year. The addition of cholecystectomy to bariatric surgery resulted in an increased risk for complications (RD = 0.02). The risk for complications (RD = - 0.09) and reoperation (RD = - 0.02) was lower when performed concomitantly with bariatric surgery compared to post-

bariatric procedure. Prophylactic cholecystectomy may be avoided. Patients submitted to bariatric surgery have low incidence rate of biliary complications, and concomitant cholecystectomy increases the risk for postoperative complications and operative time. If cholecystectomy is not indicated, patients should be carefully followed with attention for biliary complications, once cholecystectomy performed post-bariatric surgery is at higher risk for complications and reoperations [10].

Mariano Palermo *et al.*, have thoroughly reviewed the presence of gall stones in the common bile duct, although a rare complication after Roux-en-Y gastric bypass (around 0.2% of bariatric population) represents a great challenge to the surgeons due to the anatomical alteration of the GI tract by the surgery. They have recommended laparoscopic assisted trans gastric endoscopic retrograde cholangiopancreatography(ERCP), balloon enteroscopy assisted ERCP or Percutaneous ERCP, percutaneous biliary drainage and laparoscopic exploration of the Common bile duct, which method should be used is left to the discretion of the surgeon and the available equipment's and the expertise in the institution [11].

## CONCLUSION

After analyzing most of the studies, there is no gold standard opinion, whether a patient with obesity's gallbladder should be removed. If a patient has experienced symptomatic gallstones prior to choosing their treatment therapy, then it is logical and appropriate to perform a cholecystectomy either before or concurrently with the treatment option.

However, the main debate concerns patients with either no stones or asymptomatic gallstones. If the patient is undergoing a laparoscopic bariatric procedure, then the gallbladder should be left intact. The gallbladder can be easily removed if it becomes symptomatic, most likely when the patient has lost weight from a bariatric operation and is using an operative approach designed specifically to remove the gallbladder. This will expose the smallest group of patients to the least amount of risk for the given procedure.

If the patient has documented asymptomatic gallstones and is not a candidate for laparoscopic surgery, then the decision of whether to remove the gallbladder at the time of the bariatric procedure is ultimately a choice for the patient to make after being properly informed of the risks associated with the surgery. Gall stone disease can lead to severe complications and often requires hospitalization and surgery. Common bile duct stones following RYGB

though rare, is a challenge to the surgeons and should be managed in specialized centers.

Ursodeoxycholic acid (UDCA) can prevent formation of gall stone after bariatric surgery to a certain extent, though many centers are strong opponents of this treatment; however the efficacy and patients compliance is a question of concern.

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