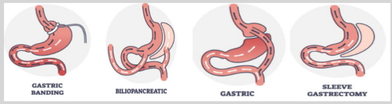
BILIARY COMPLICATIONS FOLLOWING BARIATRIC SURGERY

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INTRODUCTION

- Obesity is a rising epidemic –GLOBESITY!!!!
- Surgical treatment of obesity is effective means of weight loss and improvement in co-morbid conditions
- Obesity (BMI > 40) and rapid weight loss are risk factors for gallstone development post bariatric surgery
- Univariate analysis identified female gender, age>50, cholelithiasis at time of bariatric procedure & RYGB independent of excess weight loss as predictive factors
- Multivariate analysis confirmed advanced age as an independent predictive factors[1]

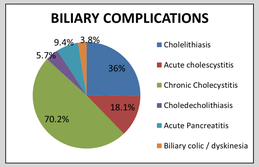


PATHOPHYSIOLOGY OF GALL STONES

- Incidence differs among various types of bariatric surgeries
- Hypocaloric diet and duodenal exclusion in gastric bypass reduces secretion of cholecystokinin and gallbladder motility
- Inefficient gallbladder emptying secondary – Surgical manipulation, injury to hepatic branches of vagus nerve, calorie restriction in post operative period, increased secretion of calcium deriving from arachidonic acid, bile mucin (which enhances crystallization), enterohepatic circulation, and bile salt disorders, which may become imbalanced after weight loss[2]

INCIDENCE AND COMPLICATIONS

- Identified risk factors- Preoperative cholelithiasis, old age, female gender, diabetes mellitus, previous bariatric surgery, BMI, significant weight loss in the first six months after surgery, genetic susceptibility, pregnancy and ddyslipidemia
- 41 % of such patients become symptomatic



- Uncommonly patients develop Choledocholithiasis
- A review of the literature was conducted mainly from 2010 up to 2023 with regard to biliary complications associated with bariatric patients in SciELO, PubMed, and MEDLINE. Patients undergoing LRYGB have a higher incidence (14.5%) of symptomatic calculi post-surgery compared to those undergoing laparoscopic sleeve gastrectomy at 4.1%

DIAGNOSIS

- Diagnosis can be confirmed by Ultrasound, Endoscopic ultra sound, CT Scan of abdomen or MRCP
- In obese individuals USG may miss 8–12% gall stones due to increased adipose tissue mass
- ERCP with cannulation of papilla can be difficult because of relatively inaccessibility to duodenum due to altered anatomy following RYGB

MEDICAL MANAGEMENT

- UDCA during the first 6 months after bariatric surgery, reduces stone formation by decreasing supersaturation of bile with cholesterol & improving gallbladder emptying[3]
- UDCA reduces incidence of gallstones from 32 to 2%
- UDCA is recommended as 300 mg twice a day for-

  -3 months BMI less than 40 kg/m2

  -4 months BMI between 40- 50 kg/m2

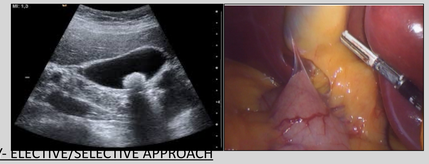
  -6 months BMI greater than 50 kg/m2

SURGICAL MANAGEMENT

GALL STONES

CHOLECYSTECTOMY- PROPHYLACTIC APPROACH

- Cholecystectomy in all patients at the time of initial surgery, regardless of presence or absence of gallstones
- Rationale - Increased incidence of gallstones after bariatric surgery compared to the normal population and low sensitivity and specificity of USG in morbid obesity
- This is supported by the findings of Fobi et al, who found abnormal findings in gall bladder specimens including gall stones, cholesterolosis and cholecystitis in 75% of surgical specimens despite negative pre-operative USG[4]



CHOLECYSTECTOMY- ELECTIVE/SELECTIVE APPROACH

- Cholecystectomy only in patients with gallstones diagnosed pre/intra-operatively, even if asymptomatic
- Rationale- Higher incidence of symptomatic disease as compared to patients without gallstones
- Hamad et al performed simultaneous cholecystectomy in 16.9% patients during RYGB and compared outcomes in those who did not have concomitant surgery

CHOLECYSTECTOMY-CONVENTIONAL APPROACH

- Involves expectant management with or without prophylactic administration of ursodeoxycholic acid (UDCA) until symptoms develop. Thus cholecystectomy is performed only when symptoms arise
- Rationale-Surgery is performed after a significant weight loss is achieved
- In the series by Bernabe et al 9.84% patients after RYGB without prophylactic UDCA required subsequent cholecystectomy and they concluded that natural history of patients with asymptomatic gallstones undergoing gastric bypass is very much like the natural history of asymptomatic gallstones in the general population

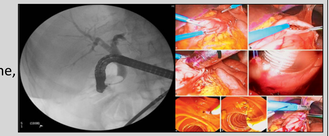
SURGICAL MANAGEMENT

CHOLEDECHOLITHIASIS

- Management of Choledocholithiasis is a challenge for both the surgeon and endoscopist
- Management of CBD stones after LRYGB makes conventional ERCP difficult due to exclusion of duodenum from gastrointestinal tract and long anatomic route from mouth to major papilla and also due to the lack of long-length side-viewing endoscopes
- Management options include –

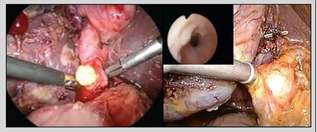
PERCUTANEOUS OR LAPAROSCOPIC ASSISTED TRANS GASTRIC ERCP

- Balloon enteroscopy assisted ERCP (BEA-ERCP) via gastric pouch and Roux (alimentary) limb up the biliopancreatic limb to the major papilla. However estimated success rate (i. e. biliary cannulation) of ERCPs performed in long-limb surgical bypass patients is approximately 60 % in most of the literature
- Laparoscopy-assisted trans gastric ERCP (LA-ERCP) has been shown to be superior to BEA-ERCP in terms of therapeutic success rate
- Biliary cannulation rates up to 100 % have been described and is associated with a significantly shorter endoscopic procedure time, but not a shorter total procedure time[5]



LAPAROSCOPIC OR OPEN CBD EXPLORATION/ CHOLEDOCHODUODENOSTOMY

- Trans cystic laparoscopic common bile duct exploration (LCBDE)- most suitable for stones less than 10 mm and for stones distal to the cystic duct and in patients with CBDs wider than 10 mm[6]
- It is also the preferred approach with stones proximal to the insertion of the cystic duct
- LCBDE and trans cystic stone extraction can be performed in patients with a Roux-en-Y Gastric Bypass



TRANS ENTERIC ERCP USING SPECIALIZED ENDOSCOPES

- Trans enteric access is a feasible technique for reaching the biliary tract through endoscopy after Duodenal Switch
- This technique could avoid most invasive and risky procedures
- It requires a high level of therapeutic endoscopic training due to the inverted view provided by the equipment during the entire procedure



PERCUTANEOUS TRANS HEPATIC INSTRUMENTATION OF CBD

- Useful alternative therapy for conditions such as complicated retained stones, biliary stones in poor surgical candidates, and altered anatomy in patients who have undergone RYGB
- Restricted to cases in which conventional endoscopic procedures were unmanageable or unsuccessful
- In a series of 261 patients treated with PTC a complication rate of 6.8% with no mortality has been reported[7]

CONCLUSION

- Complications are mostly due to the extensive surgically induced anatomical changes of gastrointestinal tract
- Incidence of complications is higher in patients subjected to bariatric surgery than overall population, as well as 8 times higher in patients with a BMI of > 40
- Primary risk factors include preoperative cholelithiasis, old age, female gender, diabetes, previous bariatric surgery, BMI, and significant weight loss in the first six months after surgery
- With exponentially increase in need for bariatric surgery due to rising obesity and failed medical management, biliary pathology is likely to increase
- As a consequence, clinicians encounter an increasing number of pancreatobiliary pathology (CBD stones) requiring ERCP within a Roux-en-Y anatomy
- Bariatric centers therefore need to strategically plan resources such as interventional radiology in order to manage such problems safely, efficiently and in a cost effective manner
- Use of UDCA is recommended because of its effectiveness in preventing biliary complications
- Surgical treatment is reserved for symptomatic patients

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