CHARACTERIZATION AND RISK FACTORS FOR EARLY BILIARY COMPLICATIONS FOLLOWING ELECTIVE BARIATRIC SURGERY: AN MBSAQIP ANALYSIS

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Background, Significance and Aims

Background:
Patients undergoing bariatric surgery are at increased risk of biliary complications due to rapid weight loss, decreased gallbladder contractility, and increased biliary cholesterol excretion. The rate of these complications within one-year of bariatric surgery has been well defined, requiring intervention in up to 13% of post-bariatric surgery patients with laparoscopic Roux-en-Y-Gastric Bypass (LRYGB), rapid weight loss, and female gender amongst the greatest risk factors.

Significance:
Biliary complications are reported to occur most commonly within 6-months of surgery. However, no study has evaluated the prevalence or risk factors for biliary complications within 30-days of bariatric surgery. Characterizing these complications is of great importance since their occurrence confer unique therapeutic challenges, with surgical and endoscopic management having substantially greater risk during the early postoperative period due to adhesions and fresh anastomoses.

Aims:
This study aims to define the prevalence of biliary complications including readmission, reintervention, and reoperation for gallstone disease within 30-days of bariatric surgery. We also perform a multivariable logistic regression to outline independent risk factors for early post-bariatric surgery biliary complications. Outcomes from this study will help guide future targeted interventions for these high-risk patients.

Methods

Retrospective cohort study of MBSAQIP data.

MBSAQIP® METABOLIC AND BARIATRIC SURGERY ACCREDITATION AND QUALITY IMPROVEMENT PROGRAM

750,498 patients



No Biliary Complications n = 749,807

Vs.



Early Biliary Complications n = 691 (0.1%)

Primary Outcome: Characterize demographic differences between patients who experienced early postoperative biliary complications (i.e. within 30-days of bariatric surgery) to those who did not.
Secondary outcome: evaluate postoperative complications for patients with early biliary complications as opposed to those without.

Biliary complications defined as any patient requiring reoperation, reintervention, or readmission with the primary reason determined to be gallstone disease within 30-days of their bariatric procedure. Only patients undergoing sleeve gastrectomy or Roux-en-Y gastric bypass without previous foregut surgery were included in our analysis in order to rule out patients with prior cholecystectomy or biliary surgery.

Results

Demographics

	No Early Biliary Complications n = 749,807 (%)	Early Biliary Complications n = 691 (%)	p-value
Age, years (mean ± sd)	44.5 ± 12.0	40.1 ± 11.9	<0.001
Female	597,026 (79.6)	606 (87.7)	<0.001
BMI, kg/m² (mean ± sd)	45.3 ± 7.8	45.7 ± 7.8	0.227
Hypertension	357,806 (47.7)	291 (42.1)	0.003
Preoperative Weight Loss	5.60 ± 5.68	5.44 ± 5.31	0.487

Post Operative Outcomes

The 691 patients with biliary complications required significantly more reoperations (86.0% vs 1.1%, p < 0.001), reinterventions (15.8% vs 1.2%, p < 0.001), readmissions (82.5% vs 3.6%, p < 0.001), and had significantly more serious complications (90.3% vs 3.2%, p < 0.001) compared to patients without biliary complications.

	No Early Biliary Complications n = 749,807 (%)	Early Biliary Complications n = 691 (%)	p-value
LRYGB	197,759 (26.4)	232 (33.6)	<0.001
Operative time, minutes			
mean ± sd	84.5 ± 46.6	81.3 ± 45.8	0.065
Postoperative Weight Loss (Kg) mean ± sd	7.29 ± 4.20	8.73 ± 4.59	<0.001
Anastomotic leak	2,778 (0.4)	6 (0.9)	0.031
Bleed	6,909 (0.9)	11 (1.6)	0.065
Reoperation	8,336 (1.1)	594 (86.0)	<0.001
Reintervention	8,717 (1.2)	109 (15.8)	<0.001
Readmission	27,070 (3.6)	570 (82.5)	<0.001
Deep SSI	1,929 (0.3)	7 (1.0)	<0.001
Sepsis	763 (0.1)	3 (0.4)	0.006
Venous thromboembolism	2,024 (0.3)	11 (1.6)	<0.001
Serious complications	24,286 (3.2)	624 (90.3)	<0.001
Death	685 (0.1)	1 (0.1)	0.643

Results

Multi-Variable Logistic Regression Evaluating Factors Associated with Early Biliary Complications

Risk Factor	Odds Ratio	95% confidence interval	p-value
Age	0.97	0.96-0.98	<0.001
LRYGB procedure (vs. SG)	1.51	1.27-1.79	<0.001
BMI	0.98	0.97-0.99	0.003
Female gender	1.89	1.47-2.44	<0.001
History of MI	1.91	0.85-4.26	0.115
GERD	1.07	0.90-1.28	0.445
Hypertension	1.30	1.08-1.57	0.006
ASA Category			
ASA 3 (vs 1-2)	1.09	0.90-1.32	0.385
ASA 4-5 (vs 1-2)	0.91	0.53-1.57	0.737
Renal Insufficiency	1.15	0.23-3.85	0.939
Hyperlipidemia	0.84	0.66-1.08	0.175
Diabetes			
Oral Medication Controlled	0.84	0.66-1.07	0.152
Insulin Dependent	0.84	0.59-1.20	0.335
Sleep apnea	0.91	0.76-1.09	0.295
Race			
Black race (vs Caucasian)	0.96	0.78-1.19	0.735
Other (vs Caucasian)	0.66	0.48-1.01	0.060
Preoperative Weight Loss	1.01	1.00-1.03	0.070
Postoperative Weight Loss	1.08	1.06-1.09	<0.001

Conclusion

Early post-bariatric surgery biliary complications occur uncommonly but are of importance due substantially increased requirements for reoperation, readmission, and reintervention. Risk factors are similar to those for delayed biliary complications including female patients, those expected to have substantial rapid postoperative weight loss, and patients undergoing LRYGB. evaluated.