A 5-year Propensity-matched Analysis of Perioperative Outcomes in Patients with Chronic Kidney Disease undergoing Bariatric Surgery

Authors: Leah Evans MS, Mohamed Aboueisha MD, Meredith Freeman MS, Michael Caposole DO, John Baker MD, Carlos Galvani MD, Shauna Levy MD, MS

Tulane University School of Medicine, New Orleans, Louisiana

Background

- Bariatric surgery can improve renal function in patients with comorbid chronic kidney disease (CKD) and obesity[1]
- Bariatric surgery can improve access to renal transplantation in patients with obesity and CKD[2]
- There are concerns about the safety of bariatric surgery in patients with CKD; however, the literature has been inconsistent regarding outcomes and risk profile
- This study utilizes a large database to understand the frequency of perioperative outcomes in patients with CKD undergoing primary bariatric surgery

Objective

- To understand which operation has a more favorable 30-day outcome in patients with CKD: vertical sleeve gastrectomy (VSG) vs. Roux-en-Y Gastric Bypass (RYGB)
- To evaluate the rate of perioperative complications in bariatric patients with CKD vs. bariatric patients without CKD
- To determine if bariatric patients with CKD who require chronic dialysis are at higher risk for perioperative complications when compared to those who do not require dialysis

References

1. Li K, Zou J, Ye Z, et al. Effects of Bariatric Surgery on Renal Function in Obese Patients: A Systematic Review and Meta Analysis. *PLoS One*. 2016;11(10):e0163907. Published 2016 Oct 4. doi:10.1371/journal.pone.0163907
2. Al-Bahri S, Fakhry TK, Gonzalvo JP, Murr MM. Bariatric Surgery as a Bridge to Renal Transplantation in Patients with End-Stage Renal Disease. *Obes Surg*. 2017;27(11):2951-2955. doi:10.1007/s11695-017-2722-6

Methods

- MBSAQIP database queried from 2015-2019
- Included patients who underwent primary VSG or primary RYGB
- Patients stratified based on CKD status
  - CKD defined as creatinine >2 mg/dL
- Performed unmatched and propensity-matched analyses comparing perioperative outcomes between the groups

Results

- 5817 (0.8%) patients with CKD underwent VSG or RYGB from 2015-2019; of whom 2266 (0.35%) were on chronic dialysis preoperatively
- Majority (74.3%) underwent VSG
- Matched analysis comparing VSG to RYGB, patients who underwent RYGB had a higher rate of deep organ space infection and reintervention within 30 days
- Within VSG cohort comparing CKD to non-CKD, patients with CKD had a higher risk of bleeding, readmission, reoperation and reintervention
- Patients with CKD undergoing VSG also had higher mortality
- Dialysis did not show any significant effect on perioperative outcomes when compared to CKD patients not on dialysis

Figures/Tables

Variable	VSG, N=1,484[1]	RYGB, N=1484[1]	p-value[2]
Drain Placed at Initial Operation	201 (14%)	403 (27%)	<0.001
Length of Stay from Operation (days)	2.00 (1.00, 2.00)	2.00 (2.00, 3.00)	<0.001
Operation Length (minutes)	76 (56, 104)	124 (93, 164)	<0.001
Post-Op Organ/Space SSI	2 (0.1%)	10 (0.7%)	0.021
Intervention within 30 days	33 (2.2%)	74 (5.0%)	<0.001

Table 1: Outcomes in patients with CKD undergoing VSG vs. RYGB

Variable	No CKD, N = 4,222[1]	CKD, N = 4,222[1]	p-value[2]
Acute Renal Failure	13 (0.3%)	36 (0.9%)	<0.001
Post-Op Cardiac Arrest Requiring CPR	4 (<0.1%)	17 (0.4%)	0.005
Post-Op Pneumonia	11 (0.3%)	24 (0.6%)	0.028
Progressive Renal Insufficiency	12 (0.3%)	24 (0.6%)	0.045
Major Bleeding	39 (0.9%)	89 (2.1%)	<0.001
Unplanned Intubation	12 (0.3%)	31 (0.7%)	0.004
Death Within 30 days	9 (0.2%)	27 (0.6%)	0.003
Re-Operation Within 30 days	54 (1.3%)	116 (2.7%)	<0.001
Re-Admission Within 30 days	207 (4.9%)	391 (9.3%)	<0.001
Intervention Within 30 days	54 (1.3%)	93 (2.2%)	0.001

Table 2: Outcomes of VSG in patients with CKD vs. without CKD

Conclusions

- VSG appears to be the safer option compared to RYGB in patients with CKD
- There is an increased risk of bleeding, readmission, reoperation, and reintervention in patients undergoing VSG who have CKD vs. those who do not have CKD
- Dialysis does not confer a significant difference in outcomes in patients with CKD who undergo VSG