Bariatric Surgery as a Bridge to Kidney Transplantation in End-Stage Renal Disease Patients

Stella T. Tsui MD,[1, 3] Jie Yang PhD,[2] Xiaoyue Zhang MS,[2] Salvatore Docimo Jr. DO, MS,[1] Konstantinos Spaniolas MD,[1] Mark A. Talamini MD, MBA,[1] Aurora D. Pryor MD, MBA[1]

[1] Division of Bariatric, Foregut and Advanced Gastrointestinal Surgery. Department of Surgery. Stony Brook University Medical Center. Stony Brook, NY, USA
[2] Department of Family, Population and Preventive Medicine, Stony Brook University Medical Center, Stony Brook, NY, USA
[3] Department of Surgery. New York-Presbyterian/Weill Cornell Medical Center. New York, NY, USA.

Introduction:
End-stage renal disease (ESRD) is a condition with significant healthcare utilization, and the reason for kidney transplantation. Obesity predicts increased risks of mortality and peri-transplant complications. Bariatric surgery has been suggested as a bridge to kidney transplantation, but its impact is unclear. This study aimed to evaluate the incidence of kidney transplantation after bariatric surgery for obese ESRD patients.

Methods:
The New York Statewide Planning and Research Cooperative System database was used to identify patients diagnosed with obesity and ESRD between 2007 to 2016 and patients who underwent bariatric procedures. Subsequent kidney transplantation was captured up to 2018. Multivariable proportional sub-distribution hazard regression analysis was performed to compare the incidence of post-surgery kidney transplantation among obese ESRD patients with and without bariatric surgery.

Results:
We identified 233 ESRD patients who underwent bariatric surgery and 24,490 obese ESRD patients without bariatric intervention. Among them, 22.8% of bariatric surgery patients and 4.8% of non-surgery patients underwent kidney transplantation by 2018. The cumulative incidence of post-surgery kidney transplantation for the bariatric surgery group was 1.8% (95% CI, 0.1%-3.5%) at 1 year, 24.3% (95% CI, 17.9%-30.7%) at 5 years and 36.8% (95% CI, 26.0%-47.7%) at 10 years after ESRD diagnosis. The cumulative incidence of kidney transplantation for the non-bariatric surgery group was 1.6% (95% CI, 1.4%-1.7%) at 1 year, 6.6% (95% CI, 6.2%-7.0%) at 5 years and 10.0% (95% CI, 9.2%-10.7%) at 10 years after ESRD diagnosis (**Figure 1)**. Bariatric surgery patients were more likely to undergo kidney transplantation than patients without bariatric surgery (HR 2.0; 95% CI, 1.5-2.7; p<0.0001). Laparoscopic adjustable gastric banding (LAGB) had a higher cumulative incidence of post-surgery kidney transplantation at the 5th (47.7%; 95% CI, 29.6%-63.8%) and 9th year post-surgery (55.7%; 95% CI, 35.8%-71.7%) than laparoscopic sleeve gastrectomy (LSG) (5th and 9th year: 32.0%; 95% CI, 20.6%-43.8%) and Roux-en-Y gastric bypass (RYGB) (5th and 9th year: 23.4%; 95% CI, 11.6%-37.5%) (**Figure 2**). Among all bariatric surgery patients who ended up having kidney transplantation by 2018, LAGB (n=18; median: 1.6 years) and LSG (n=25; median=1.6 years) had a slightly longer time from bariatric surgery to undergoing kidney transplantation than RYGB (n=10; median=1.5 years).

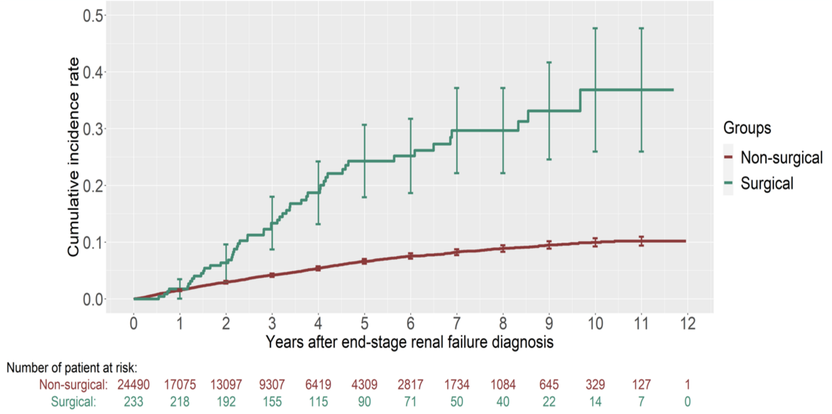


Figure 1. Cumulative incidence of kidney transplantation between surgical and non-surgical groups

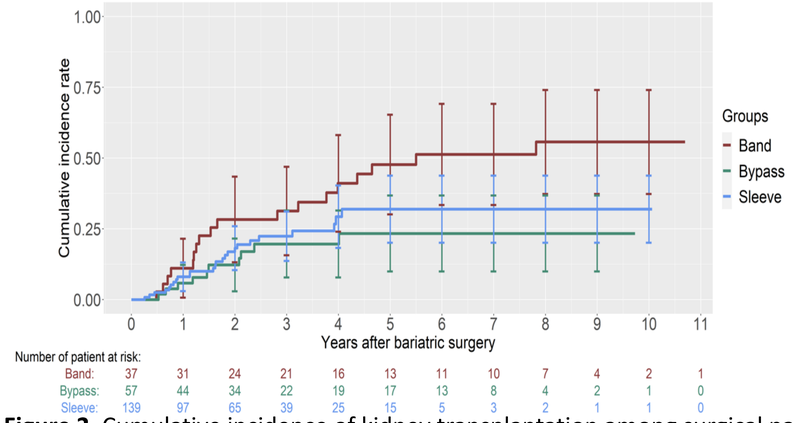


Figure 2. Cumulative incidence of kidney transplantation among surgical patients by bariatric surgery type

Conclusion:
These findings suggest that bariatric intervention was associated with an increased rate of kidney transplantation in obese patients with pre-existing ESRD. This study supports the expansion of bariatric surgery to serve as a bridge to kidney transplantation in obese patients with ESRD.