

Association of Metabolic Surgery with All-cause Mortality among Individuals with Diabetes

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Background

Metabolic surgery is an effective approach to management of obesity in persons with diabetes. Specifically, bariatric surgery is associated with significant weight loss, improved diabetes control, and higher remission rates of type-2 diabetes. Metabolic surgery is also associated with reduced all-cause mortality in the overall bariatric surgery population, but less is known about mortality experience in patients with diabetes.

Objective

To assess the association between metabolic surgery and all-cause mortality in a large matched cohort of obese individuals with diabetes.

Methods

A retrospective cohort study that included patients from a large Israeli HMO (Clalit) with diabetes who underwent bariatric surgery during the years 2005 and 2014. Using a sequential (time-dependent) stratification matching, three matched non-surgical patients were selected for each surgical patient, based on age, sex, and BMI. Follow up period was from index-date (date of surgery) until occurrence of event (all-cause mortality) or end of study period (December 31 2015). Unadjusted and adjusted Stratified Cox proportional hazards regression were used to assess the hazard ratio (HR) and 95% CI for the association between exposure to metabolic surgery and all-cause mortality.

Results

2,391 individuals with diabetes underwent metabolic surgery during the study period (Laparoscopic banding [n=764], gastric bypass [n=524], laparoscopic sleeve gastrectomy [n=1,100]). Of these, 51 (2.1%) died during follow-up (Median [IQR]: 46 months [30-67]). Adjusted hazard ratios (HRs) for mortality among non surgical vs. surgical patients with diabetes were as follows: HR_{total} : 2.36 (1.72-3.22); HR_{band} : 2.75 (1.68-4.51); HR_{sleeve} : 1.90 (1.10-3.34) HR_{bypass} : 2.78 (1.23-4.21).

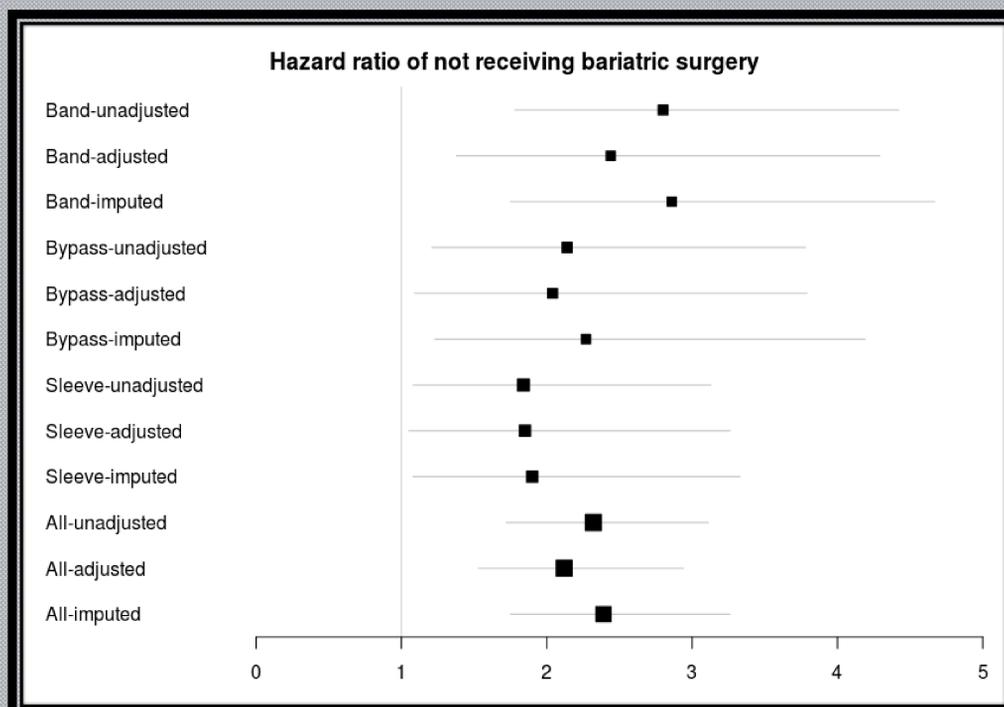
Baseline characteristics

	Surgical patients	Non-surgical patients
Age	52.0 (9.8)	52.0 (9.8)
Sex (% female)	58.3%	58.3%
Diabetes duration median (IQR)	4.9 (1.8-8.5)	4.7 (2.2-7.9)
HbA1c, median (IQR) of last measurement	7.5 (7.7-8.8)	7.2 (6.5-8.6)
Oral hypoglycemic medications, n (%)	1,790 (74.9%)	5,173 (72.1%)
Injectable therapy for diabetes	776 (32.5%)	1,648 (23.0%)

Duration of follow-up (weeks)

Median (IQR)	Band	Bypass	Sleeve
Surgical patients	69.0 (46.0-98.0) n=767	51.0 (30.0-77.0) n=524	35.0 (25-48) n=1100
Non-surgical patients	65.0 (41.0-94.0) n=2301	47.0 (28.0-75.0) n=1572	34.0 (24.0-47.0) n=3300
Total study population			
Surgical patients: 46 (30-67)			
Non-surgical patients: 44 (28-64)			

Hazard ration for mortality



Conclusions

Among obese patients with diabetes in the intermediate period, the 3 common types of metabolic surgery are associated with a lower risk for all-cause mortality.

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