Gastric Bypass Provides Better Co-morbidity Resolution and Weight Loss than Sleeve Gastrectomy in Patients with Central Obesity

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INTRODUCTION:

Body-fat distribution has been implicated in the severity of the metabolic effects of obesity. Specifically, compared to peripheral obesity, central obesity has a higher risk of metabolic syndrome and sleep apnea. Unfortunately, little data is available on how body-fat distribution impacts bariatric surgical outcomes. We investigated the effect of preoperative body-fat distribution on outcomes after Roux en Y gastric bypass and sleeve gastrectomy.

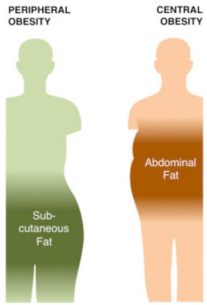


Figure 1: Peripheral vs central adiposity

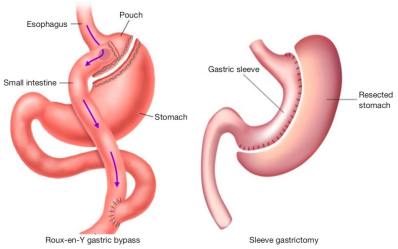


Figure 2: Roux en y gastric bypass and sleeve gastrectomy anatomy

METHODS :

A 5-year retrospective review of consecutive patients undergoing primary bariatric surgery procedures at a single institution was undertaken. Central adiposity was defined as a waist to hip ration (cm) greater than 95% in males and greater than 85% in females. The proportion of patients achieving >50% excess weight loss (%EWL) and the frequency of obstructive sleep apnea, hypertension, GERD, hyperlipidemia, COPD, diabetes, and chronic insulin use. At 6 months follow up 413 patients were included in the analysis, 369 of whom are female. At one year follow up 246 patients were included, 220 of whom are female. Analysis was performed using SAS software. Weight loss analysis was performed with logistic regression and comorbidity statistical analysis was performed using Fischer's exact test.

RESULTS:

Patient Demographics

Table 1	1 year combine (n=246)	1 year female only (n=220)	Central Adiposity Female	Peripheral Adiposity Female
Operation Sleeve Bypass	61 (24.8) 185 (75.2)	55 (25.0) 165 (75.0)	37 (23.3) 122 (76.7)	18 (29.5) 43 (70.5)
>50% EWL	201 (81.7)	178 (80.9)	127 (79.9)	51 (83.6)
Central Adiposity	177 (72.0)	159 (72.3)	--	--
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age	44.0 (11.2)	44.0 (11.0)	44.6 (10.8)	42.3 (11.6)
Pre BMI	48.1 (8.1)	47.9 (8.0)	47.3 (7.9)	49.5 (8.1)
Pre EBW	155.0 (51.2)	151.0 (49.0)	148.3 (48.1)	158.0 (150.9)
	N (%)	**N (%)**	**N (%)**	**N (%)**
OSA	111 (45.1)	93 (42.3)	74 (46.5)	19 (31.2)
HTN	136 (55.3)	118 (53.6)	90 (56.6)	28 (45.9)
GERD	22 (8.9)	22 (10.0)	15 (9.4)	7 (11.5)
HLD	92 (37.4)	82 (37.3)	67 (42.1)	15 (24.6)
COPD	4 (1.6)	4 (1.8)	4 (2.5)	0 (0)
Poor Functional Status	5 (2.0)	4 (1.8)	4 (2.5)	0 (0)
History of MI	3 (1.2)	1 (0.9)	2 (1.3)	(0)
DM	76 (30.9)	67 (30.5)	57 (35.9)	10 (16.4)
Opioid Rx Preop	26 (10.6)	23 (10.5)	15 (9.4)	8 (13.1)
Stimulant Rx Preop	4 (1.6)	4 (1.8)	4 (2.5)	0 (0)
Benzo Rx Preop	17 (6.9)	15 (6.8)	10 (6.3)	5 (8.2)
Cigarette Use	54 (22.0)	45 (20.5)	35 (22.0)	10 (16.4)

Table 2	6 months combine (n=413)	6 months female only (n=369)	Central Adiposity Female	Peripheral Adiposity Female
Operation Sleeve Bypass	122 (30) 291 (70)	110 (29.8) 259 (70.2)	80 (29) 193 (71)	30 (31.3) 66 (68.8)
>50% EWL	275 (66.6)	240 (65.0)	182 (66.7)	58 (60.4)
Central Adiposity	310 (75.0)	273 (74.0)	--	--
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Age	43.7 (11.2)	43.4 (11.1)	44.0 (11.3)	41.9 (10.4)
Pre BMI	48.0 (7.5)	47.9 (7.5)	47.7 (7.5)	48.3 (7.6)
Pre EBW	154.7 (48.5)	151.6 (47.5)	151.2 (48.6)	152.7 (44.6)
	N (%)	**N (%)**	**N (%)**	**N (%)**
OSA	186 (45.0)	154 (41.7)	121 (44.3)	33 (34.4)
HTN	225 (54.5)	199 (53.9)	158 (57.9)	41 (42.7)
GERD	70 (17.0)	68 (18.4)	48 (17.6)	20 (22.8)
HLD	146 (35.4)	134 (36.3)	112 (41.0)	22 (22.9)
COPD	11 (2.7)	11 (3.0)	8 (2.9)	3 (3.1)
Poor Functional Status	10 (2.4)	9 (2.4)	8 (2.9)	1 (1.0)
History of MI	4 (1.0)	3 (0.8)	3 (1.1)	0 (0)
DM	118 (28.6)	106 (28.7)	91 (33.3)	15 (15.6)
Opioid Rx Preop	36 (8.7)	30 (8.1)	19 (7.0)	11 (11.5)
Stimulant Rx Preop	6 (1.5)	5 (1.4)	4 (1.5)	1 (1.0)
Benzo Rx Preop	26 (6.3)	23 (6.2)	18 (7.0)	5 (5.2)
Cigarette Use	79 (19.1)	67 (18.2)	56 (20.5)	11 (11.5)

Table 1 and 2: Demographic data for single institution patient database for 1 year and 6 month follow up time points. Sleeve = sleeve gastrectomy, bypass = gastric bypass, EWL = estimated weight loss, BMI = body mass index, EBW = excess body weight, OSA = obstructive sleep apnea, HTN = hypertension, GERD = gastroesophageal reflux, HLD = hyperlipidemia, COPD = chronic obstructive pulmonary disease, MI = myocardial infarction, DM = diabetes mellitus, Rx = prescription

Table 3: Odds ratio of achieving at least 50 %EWL for gastric bypass compared to sleeve gastrectomy demonstrating improved weight loss with gastric bypass

Combined

1 year	OR	95% CI
Peripheral Obesity	3.07	(0.83, 11.07)
Central Obesity	**3.19**	**(1.42, 7.16)**

Female Patients Only

1 year	OR	95% CI
Peripheral Obesity	2.93	(0.73, 11.74)
Central Obesity	**3.52**	**(1.53, 8.08)**

6 months	OR	95% CI
Peripheral Obesity	1.18	(0.50, 2.78)
Central Obesity	1.66	(0.995, 2.78)

6 months	OR	95% CI
Peripheral Obesity	1.03	(0.43, 2.5)
Central Obesity	**1.76**	**(1.03, 3.03)**

Bolded text indicates statistical significance

In peripheral and centrally obese female patients who had gastric bypass at six months there was a statistically significant change in the percentage of diabetic patients ($p = 0.0312$), more specifically in insulin dependent diabetics ($p = 0.0128$), with trends towards changes in hypertension ($p=0.0738$) and hyperlipidemia ($p=0.0635$). Likely due to the smaller number of patients who complete one year follow up, in peripheral and centrally obese female patients who had gastric bypass there is only a statically significant change in the percentage of diabetic patients using insulin ($p=0.0226$). No significant changes were seen in co-morbidities in patient after laparoscopic sleeve gastrectomy.

CONCLUSIONS:

- Centrally obese patients benefit most from gastric bypass bariatric surgery to achieve greater than 50% estimated weight loss and reduction in comorbidities associated with obesity.
- Peripherally obese patients may not achieve the same weight loss but do benefit from a reduction in comorbidities with bariatric surgery.

References:

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