Journal of
Obesity & Weight Loss Therapy

Review Article Open Access

Comparison of Anthropometric and Body Composition Outcomes between Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Narrative Review

Terry Brown*, Kimberly Gottesman, Melanie Newkirk and Jane Ziegler

Department of Clinical and Preventive Nutrition Sciences, Rutgers School of Health Professions, Newark, New Jersey 07107

Abstract

Bariatric surgery is a well-accepted treatment option for sustained weight loss and improvement in comorbid conditions; however, it is unclear which procedure (laparoscopic Roux-en-Y gastric bypass [LRYGB] or sleeve gastrectomy [LSG]) has the greatest e ect on anthropometric and body composition outcomes. It is important to ascertain which bariatric procedure is most e ective at maximizing excess weight loss and determining what body compartment is most a ected so that individualized nutrition and physical activity interventions can be implemented.

Ba a c ; B d c ; R - -Y a c b a ; S a c

95% CI -0.38 -0.33), b - ca b cc a a b c c LRYGB (*P* = 0.005, 95% CI: -0.25 0.05) [11]. I c a , a c U d S a (US). Acc d C D a C c a d P a c , a a 42.5% US ad a d 20 a d ab b a d 9.2% b LRYGB (*P* = 0.36, 95% CI: -0.52 0.19) [12]. Ob c a d a c a d bab d c- b d c c a ca d a c a d a 2 d ab (T2DM), a d c a ca c [2].1 add , c [11-13]. a d ca c Ba a b a -acc $260 b a 2016 a a d d a a $2,505 d ca ca c a b d c a d [14,15]; c a ,[3]. c a c ba a c c d a a c P a b a a c a d b d c c c ad . I a b a a d d ca a a b ca d da ba a c a . Na a I H a (NIH) c a d ca a ad a a b d a d (BMI) 35 40 / ² c- b d a a 40 / ² c- b d a a ca d da ba a c [4]. A ca S c M ab c a d Ba a c S (ASMBS) 256,000 ba a c d 2019, c a 1% US a c b ba d NIH c a [5]. c c d a a c c a c (59.4% LSG) a d a a c c R - -Y a c b a (17.8% LRYGB) [5]. Ba a c c d d c a da - a cc , ab c c- b d , a d d a [6,7]. I a d a a d da a a c a d a- a a , McG c a . [8] a d a c (% EWL) a 10- a ba a c a 53.6% RYGB a d 47.2% SG. M , ba a c a c a d , V a . [9] d a d d a d ca a a d a c BMI (% EBMIL) 69.1% c a d 14.6% EBMIL a a c d a (. ., d a d d a a d c).

a d a c LRYGB LSG a c d a a c , c a . S M c B a S S d (SM-BOSS) a a a c , a d d c (RCT) c d c d 2007-2011 a d c LSG (= 107) a d LRYGB (= 110) , c a c- b d , ad , a d , = 0.88,

***Corresponding author:** Terry Brown, Department of Clinical and Preventive Nutrition Sciences, Rutgers School of Health Professions, Newark, New Jersey 07107, Tel: (214) 693-4766; E-mail: Terry.brown@healthtrustpg.com

Received: 07-Jun-2022, Manuscript No. JOWT-22-66051; **Editor assigned:** 08-Jun-2022, PreQC No. JOWT-22-66051(PQ); **Reviewed:** 22-Jun-2022, QC No. JOWT-22-66051; **Revised:** 27-Jun-2022, Manuscript No. JOWT-22-66051(R); **Published:** 04-Jul-2022, DOI: 10.4172/2165-7904.1000501

Citation: Brown T, Gottesman K, Newkirk M, Ziegler J (2022) Comparison of Anthropometric and Body Composition Outcomes between Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Narrative Review. J Obes Weight Loss Ther 12: 501.

Citation: Brown T, Gottesman K, Newkirk M, Ziegler J (2022) Comparison of Anthropometric and Body Composition Outcomes between Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Narrative Review. J Obes Weight Loss Ther 12: 501.

Author, Year, Study Design, Country, Funding Source	Quality Grade (+, -, Ø)	Study Purpose	Study Population (Demographics)	Intervention and Setting	Outcome Data	Conclusions/ Results	Limitations of Findings
Venancio FA, Almeida LA, et al.[24] **Year:** 2021 **Study Design:** Prospective Cross sectional **Class Rating:** D **Country:** Brazil **Funding Source:** Espirito Santo Research and Innovation Support grant and a partial scholarship	**Ø**	To explore outcomes for patients with obesity who underwent LRYGB compared to LSG at 6-months postoperative.	**N** = a convenience sample of 39 adults who underwent bariatric surgery. Aged 18 to 60 years old. BMI > 40 kg/m^2 or > 35 kg/m^2 plus co-morbidities and psychological testing. Exclusion criteria included pregnancy, pacemaker users, and subjects with metal implants. Demographics **Mean Age** (years) LRYGB: 41.2±7.8 LSG: 42.9±5.3 **Sex** (n M/F) LRYGB: 5/20 LSG:2/12				

Kavanagh R, Smith J, et al.[19] **Year:** 2020 **Study Design:** Prospective Cohort Study **Class Rating:** B **Country:** Iowa City, Iowa **Funding Source:** Medtronic Surgical Innovations External Research Program grant	Ø	To examine body composition changes after LSG compared to LRYGB at 12-months postoperative.	**N** = 63 adult patients who underwent bariatric surgery in January 2015 to August q h8ye0 1 Tf(2020)TjTjET0 0 0	SCN0.513 w hey hct	August		

Kim G, Tan CS, et al.[20] **Year:** 2019 **Study Design:** Retrospective Cohort Study/ Secondary Analysis **Class Rating:** B **Country:** Singapore **Funding Source:** None **p.**								

Otto M, Elrefai M, et al.[22] **Year:** 2016 **Study Design:** Prospective Cohort Study **Class Rating:** B **Country:** Germany **Funding Source:** None	Ø	To compare the e ects of LSG and LRYGB on body composition post adjustment for BMI at 1 year.	**N** = 173 adult patients who underwent bariatric surgery in January 2007 to February 2012. Met guidelines for bariatric surgery - BMI > 40 kg/m² <u>or</u> Ó 35 kg/m² plus co-morbidities. <u>Demographics</u> **Age:** N/A **Sex** (n M/F) LRYGB: 34/93 LSG: 17/29 <u>Anthropometrics</u> **Mean Weight** (kg) LRYGB: 129.8±22 LSG: 163.9±29.4 **Mean BMI** (kg/m²) LRYGB: 45.6±5.7 LSG: 55.9±7.8 <u>Body Composition</u> **Mean LM** (kg) LRYGB: 71.4±15.9 LSG: 83.5±20.5 **Mean % Body Fat** LRYGB: 46±7.5 LSG: 49.2±7.7 **Attrition rate**: 26.6% (only included if subjects showed up at all follow-up appointments.)	**Intervention:** Subjects underwent bariatric surgery of either a n =127 LRYGB <u>or</u> n = 46 LSG Patients with a BMI > 60 kg/m2 or previous small bowel surgeries were o ered the LSG. **Surgical Technique** LRYGB: 150-cm Roux-en-Y limb and 50-cm BP limb LSG: used a 42-Fr bougie **Anthropometric and Body Composition** Nutriguard-M BIA (Data input GmbH, Darmstadt, Germany) was used to assess weight and body composition measurements. **Diet and Exercise** Patients received nutrition counseling by a bariatric specialist at each outpatient visit. Encouraged participants to begin an active exercise regimen and consume 1.5 g protein per kg IBW. Protein supplements were recommended for patients that were deemed to be protein deýcient. **Setting:** Germany	<u>Anthropometrics</u> **Mean Weight kg** (1 year) LYRGB: 90.6±18.3 LSG: 112.4±23.5 **% TWL** (1 year) LRYGB: 31.7±8.4% LSG**:** 30.48±7.6, P > 0.4 **Mean % EWL** (1 year) LRYGB: 62.9±18 LSG: 52.3±15.0, *P* = 0.0024 **Mean BMI kg/m²** (1 year) LRYGB: 31.4±5.4 LSG: 38.2±6.6 <u>Body Composition</u> **Mean LM kg** (1 year) LRYGB: 61.7±12 LSG: 68.8±13.7, *P* = 0.33 **Mean % Body Fat** (1 year) LRYGB: 30.5±9.7 LSG: 37.1±9.2, *P* = 0.01 *(After BMI adjustment, % EWL (P = 0.86), LM (P = 0.92), and % Body Fat (P = 0.16) were not*	RYGB and LSG have comparable results for % EWL and body composition measures at 1-year post-bariatric surgery after adjustment for baseline BMI. % TWL did not require adjustments for variability in BMI between the two groups; therefore, it may be a better tool than % EWL.	**Strengths** 1. Prospective Study 2. ANCOVA to adjust for selection bias 3. Used recognized German guidelines for bariatric surgery 4. Routine nutrition counseling by bariatric specialist 5. 98% follow-up rate at 1 year postoperative **Limitations** 1.Small sample size, non-randomized study 2.Single center study 3.Short-term study 4.Selection bias since subjects were not randomized 5.Only included study participants' data that came to all 6 follow-up appointments (73.4%) 6.Used BIA to assess body composition 7.Confounding variables, i.e., diet and exercise not controlled for

d c c d a d % EWL a d a [17-22,24,27]. G a a d a. [18], Ka a a a. [19], K a. [20], a d O a. [22], a a d c ba a c a c a d b d c a d d ca d c % EWL a ad a LRYGB c a d LSG a a d a a a BMI ad . I a c da a a da a a ad a (N = 295) c ca b a d ba a c , K a. [20] d a % EWL a LRYGB c a d LSG a (77.5 30.4% . 71.8 30.5%), (77.3 37.2% . 66.8 46.6%) a d a (67.7 32.5% . 64.3 37.8%) a ; , ca (P > 0.05) [20]. d b K a. [20] c d b Ka a a a. [19] (N = 63) a d O a. [22] (N = 173) a a d a LRYGB d a % EWL c a d LSG a a, b d G a a d a. [18] (N = 43) a d LSG d b % EWL a a . S d a c a LRYGB G a a d a. [18] d a d d a LSG , c d da a ad ba . E d c a a ba a d BMI a a c a d a % EWL c d a LRYGB c a d LSG [28]. % EWL b Ka a a a. [19], O a. [22], a d G a a d a. [18] a ca ca ; , a c c a d LRYGB cac a

% EWL c a d LSG. Acc d ASMBS, % EWL c d b a a 60% a a d 77% a 12 a [29]. I , % EWL d a c a K a. [20] a c a ab c d a LRYGB a d LSG a a a (77.5 30.4% . 71.8 30.5%) d b Ka a a a.[19] (53.4% . 47.2%, P = 0.165) a d O a.[22] (62.9% . 52.3 15.0%, P = 0.86 a BMI ad) a a a d G a a d a. [18] (52.3 13.4% . 66.4 23.8%, P > 0.05) a a b c d % EWL c [19,20,22]. A a d a c a K a. [20] (87%) a d O a. [22] (73%) d LRYGB c a d 47% d a c a Ka a a a. [19] a d 51% G a a d a. [18]. A , LRYGB ad R - -Y a d b a c a c b a a d 100 150 c a d 50 100 c , c [18-20,22]. D c ba a c a c , c d a c c a d a a b a ,c d a c a c a b ca a ab d a c a d c a d ab ca ac [30].

R c d a ca d b % EWL b a ac a a c a ba a c [31,32]. C c a. [32] c d c d a 12- c d a b c a a - ba a c 2,420 US a . d d ca d a % TWL a % EWL c a c d a c

Schneider J, Peterli R, et al.[23] **Year:** 2016							

b a BMI [32]. % TWL d d a d c a a d a a a [25]. I , d a d ba d % TWL [17,20,22]. S d a c a K a . [20] ad a % TWL 26.1 7.7% LRYGB c a d 26.3 9.8% LSG (P > 0.05) a a - a ; c , c d d O a . [22] c d a % TWL 31.7 8.4% LRYGB c a d 30.48 6.7% LSG (P > 0.4). K a . [20] a d a % TWL a d ab a a a (LRGB 25.7 9.5 . LSG 26.9 17.3%, P > 0.5), b a a d a a (LRYGB 23.7 10.1% . LSG 23.9 11.1, P > 0.05); , a ca ca . W K a . [20] a d O a . [22] d a d cc , B a . [17] d a b LRYGB a d LSG c a - a a a . N % TWL c K a ., [20] O a ., [22] B a . [17] a ca ca b LRYGB c a d LSG.

BMI d c d ac a d a [18,24], a [20,22], a d a a ba a c [20]. B a . [17] (N = 142) a d c LRYGB c a d LSG b d c a a a ba a c a d d a d a d ba d BMI a d % TWL b ba a c c d ; , c d cc d a a d b K a . [20] A ba BMI d a c a B a . [17] a d K a . [20] c a ab b a , a d a c a K a . [20] d a LSG. Ma - b a , c a a d c b d [17,20]. S - , c d c d c d b V a c a . [24] (N = 39) a d G a a d a . [18] (N = 43) d ca d c BMI b LRYGB c a d LSG a a (P = 0.749 a d P > 0.05, c). A , K a . [20] d ca d c BMI LRYGB c a d LSG a , , a a (P > 0.05). S a ab a (TWL), ab c a BMI a b b a c a ac d . A a a d c BMI ca c a % EBMIL. [25] Ma a a . [21] (N = 121) a d - c a LRYGB c a d LSG a a a b . a d a LRYGB a LSG a d % EBMIL a (65.2% . 46.7%, P = 0.002), (65.8% . 44.9%, P = 0.004), (64.4% . 30.5%, P = 0.001), a d a (55.6% . 17.6%, P = 0.016) a ba a c . [21] A a a Ma a a . [21] d a d c % EBMIL b ba a c c d c d b a d ca d c ba d a c a a BMI (P = 0.006) a d (P = 0.003) LSG c d d c - c a c . M , % EBMIL b a a LRYGB a a (58.7% . 40.9%, P = 0.015), a (62.8%, . 43.0%, P = 0.033) a (60.2% . 35.1%, P = 0.031), a d a (56.7% . 16.9%, P = 0.013) a c a d LSG c a [21]. b Ma a a . [21] a c Sc d a . [23] (N = 43) d % EBMIL a a LRYGB c a d LSG (76.4 22.2% . 64.4 24.2%, P < 0.046) a a . (b

6.7 a a . B a . [17] a d b d c da a 115 142 d a c a DEXA. I c da a c d - d [17]. W Sc d a . [23] a a d b d c DEXA, Ka a a a . [19] d a d ac a d, a d O a . [22] d BIA. LM c b d 45% TWL LRYGB a d 37% LSG Sc d a . [23]; , G a a d a . [18] d a FFM c b d 24.9 7.1% TWL LRYGB c a d 24.5 6.6% LSG . Sc d a . [23] a d a d a c a DM ad ca LM (48.7 10.5 . 57.9 14.4 , P = 0.037), b a d c a LM a a c a DM (-16.3 15.7 . -12.6 5.8 , P = 0.55).

F d d d a FM a d % FM c a ab a a d LRYGB LSG a a d , , a d a a [18-20,23,24]. TWL a a a FM LM FFM [18,19,21]. a d a c a a , c c d b TWL a FM [17,18,20-24]. R a c d ca a a a % FM a d FFM LM a a [39,40]; , b d a c d d d . S a , B a . [17], O a . [22], a d K a . [20], a d ca d c % BF LRYGB LSG . P c BF a d 30-44%. D a a b d c (DEXA, BIA, a d d ac a) d, c ac d . O a , d d ca a FM, % FM, a d % BF a c a ab a c ca b d LRYGB a d LSG [17-20,22-24]. Add a , a d a c a ac a d b FM a d % BF a a FFM LM [17-24].

c a a d a a LRYGB a d LSG a b acc ab ac a a c ca b a a b cc ad a b a a d/ d ca a a [17-24]. A a ca ca d c a d b LRYGB a d LSG K a . [20], O a . [22], G a a d a . [18], Ka a a a . [19], B a . [17], V a c a . [24], LRYGB d a a b a % EWL d - d c d c d b Ma a a . [21] a d - d b Sc d a . [23]. Add a d - a d - d a c a c ca c (. . a c a d b d c) a c a d LRYGB a d LSG a c a d a d c ba a c c d b b a a a d FM LM .

W -ba a c c a c b a FM, FFM, a d/ LM . W FM d ab , LM c d b d a ac a d a d a b d c ab c a a d d c a c a ca ac a a c [41]. R a c b N a . [42] d ca d a a d , a , a a BMI, a d a d LRYGB LSG a c c FFM a . Ad a c a d ca ac a a da d c da a a a d c a d/ LM. A a c d a d c d ca a a a a d ba a c d c ad a

c a -b a ca ac da , a c ad a a d/ a ca d d c a LM a b c c [41,43]. M a c c a ab a d d ba a c LM .

L a d d c d a , ba c a ac c , a a d a c a a , ac a d a , a d d d d a b d c . A , d a b a ab a c d d a d b a c a a a c a c d c d a a c a b ba a c [17-24]. Ma a a . [21] a d a c d d a BMI > 50 / ² a d ad a a b a 60 a a d (= 11); , a c d d a a d c ba a c c d c c ca b a d a c a . I add , d c d d d d d - a c K a . [20] c a b a a a d d a - a a d d d d a [44]. Ba a c a a d a d a ab d c [44]. La , a a a c d - a d - d a d c a c a d b d c a a . A a ab c d ad d b a a d a ab a d . La - ca , -c , - RCT a c a a . Add a , a c d b c a d ASMBS c da a da d d c , a a c a ac d .

D a a ca d c b LRYGB a d LSG, a a ba a c , b d c , a d d a c , d c c d d a ca d c d a d b d c [17-20,22,24]. d - a a d d a d ba a c FM, b a , c a LM, c a ca c ca ac c [17-24]. C c a d c a c 60 100 a da LM [45], b d a a " " c a a ad c c da . A , c ca d c a a b a ca ac c a a d a d ca a b . F a , ASMBS c d 20 d ac (. ., a b c a d a c a) a a a a d 30 d a - ca ac da a [46]. C ad a a d b ca ac a b b c a a a d b d c c .

A c a d b d c c a c a ab b LRYGB a d LSG [17-20,22,24]. M - RCT a c a d d d c ba a c c d c a d a d c a c a d b d c c ba d d , a , c , d b , c - b d , c , a d ca ac .

Citation: Brown T, Gottesman K, Newkirk M, Ziegler J (2022) Comparison of Anthropometric and Body Composition Outcomes between Laparoscopic Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Narrative Review. J Obes Weight Loss Ther 12: 501.

References

1. https://www.cdc.gov/nchs/fastats/obesity-overweight.htm
2. https://www.cdc.gov/obesity/data/adult.html
3.

et al. (2020) Rate and Determinants of Excessive Fat-Free Mass Loss After Bariatric Surgery. Obes Surg 30: 3119-3126.

43. Ito MK, Gon-alves VSS, Faria SLCM, Moize V, Porporatti AL, et al. (2017) E ect of Protein Intake on the Protein Status and Lean Mass of Post-Bariatric Surgery Patients: a Systematic Review. Obes Surg 27: 502-512.
44. Puzziferri N, Roshek TB, Mayo HG, Gallagher R, Belle SH, et al. (2014) Long-term follow-up after bariatric surgery: a systematic review. JAMA 312: 934-42.
45. ASMBS American Society for Metabolic and Bariatric Surgery (2022) Life After Bariatric Surgery.
46. King WC, Bond DS (2013) The importance of preoperative and postoperative physical activity counseling in bariatric surgery. Exerc Sport Sci Rev 41: 26-35.