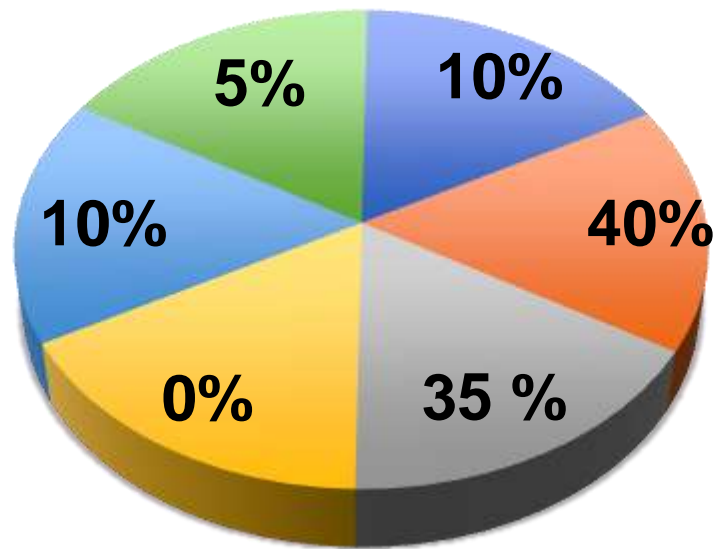


Long Term Outcomes of Laparoscopic MGB/OAGB Adolescent Population.

- Diya Mohammed
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- American Academy of Cosmetic Surgery
- Dubai UAE

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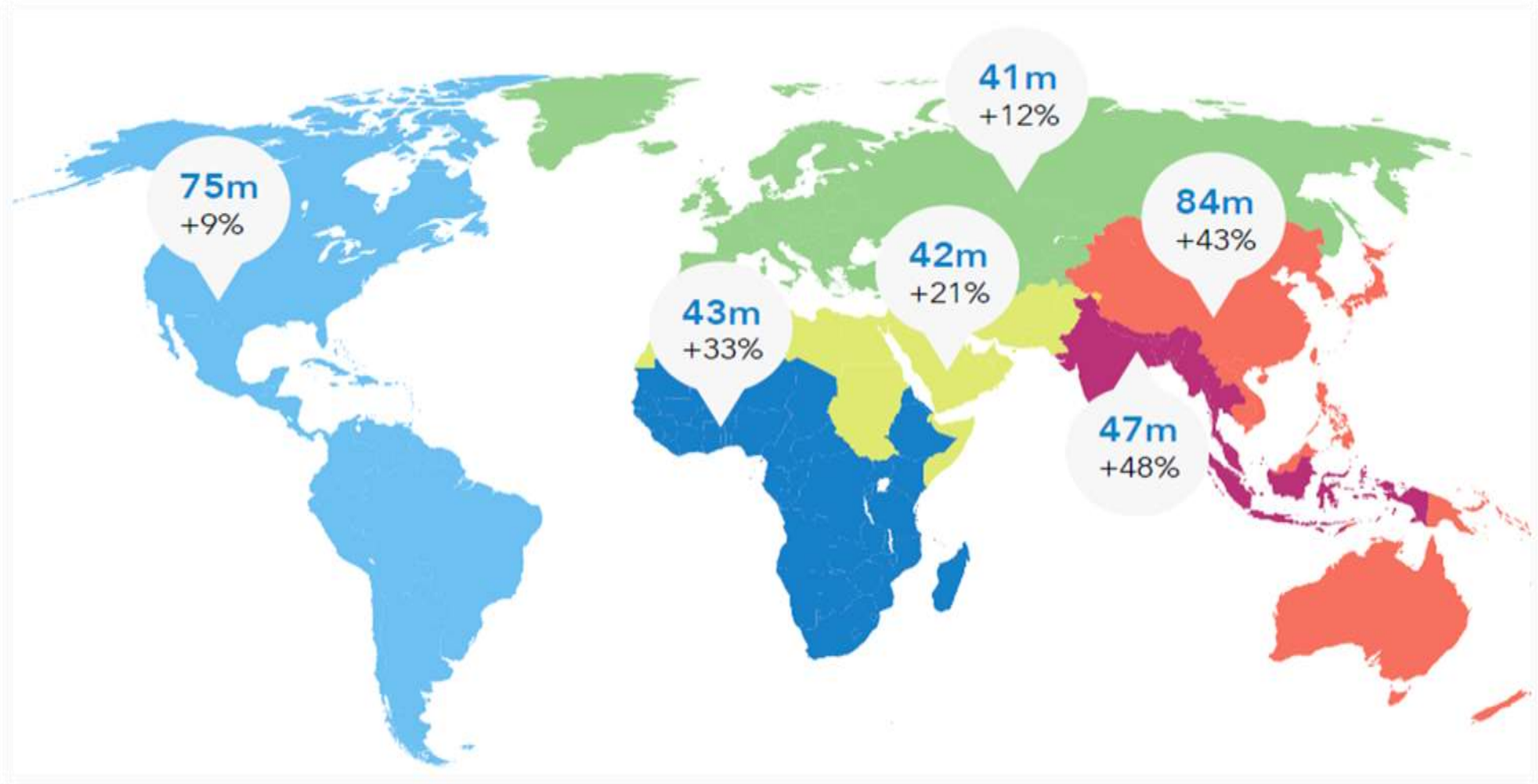




- RYGB
- SG
- OAGB
- DS/SADI-S
- REVISION AL ENDOSCOPIA

I have no potential conflict of interest to report





NAPOLI
2023

Introduction

- According to the American Academy of Pediatrics (AAP) policy statement in 2019, MBS is the treatment of choice for children/adolescents with BMI of more than 40 or 140% of the 95th percentile or BMI greater than 35 or 120% of the 95th percentile, with an obesity-associated medical problem
- Metabolic and bariatric surgery (MBS) has superior results in both efficacy and durability in weight loss outcomes and improvement of obesity-associated medical problems with similar perioperative complications to adults



Introduction

- The efficacy and safety of different surgical methods in children and adolescents are still under debate.
- There are limited published data evaluating the efficacy and safety of OAGB in children and adolescents.
- This study aimed to evaluate the safety and efficacy of OAGB compared to SG and RYGB during a 5-year follow-up.

Introduction

- The problem is long-term data
- Patients are getting older
- Loss of follow up due to life changes

Co-morbidity resolution in morbidly obese children and adolescents undergoing sleeve gastrectomy.

[Alqahtani AR](#)¹, [Elahmedi MO](#)², [Al Qahtani A](#)².

[Obes Surg.](#) 2018 Feb;28(2):513-519. doi: 10.1007/s11695-017-2884-2.

A 5-Year Follow-Up Study of Laparoscopic Sleeve Gastrectomy Among Morbidly Obese Adolescents: Does It Improve Body Image and Prevent and Treat Diabetes?

[El-Matbouly MA](#)¹, [Khidir N](#)², [Touny HA](#)³, [El Ansari W](#)⁴, [Al-Kuwari M](#)², [Bashah M](#)².

[Surgery.](#) 2012 Aug;152(2):212-7. doi: 10.1016/j.surg.2012.05.010.

Early results after laparoscopic sleeve gastrectomy in adolescents with morbid obesity.

[Nadler EP](#)¹, [Barefoot LC](#), [Qureshi FG](#).

[+](#) Author information

Weight Loss in Adolescents After Bariatric Surgery: A Systematic Review.

[Karasko D](#)¹.

[Surg. Obes. Relat. Dis.](#), 2018 Mar;14(3):413-422. doi: 10.1016/j.soard.2017.10.003. Epub 2017 Oct 10.

Weight loss after bariatric surgery in obese adolescents: a systematic review and meta-analysis.

[Pedroso FE](#)¹, [Angriman F](#)², [Endo A](#)², [Dasenbrock H](#)³, [Storino A](#)², [Castillo R](#)², [Watkins AA](#)⁴, [Castillo-Angeles M](#)², [Goodman JE](#)², [Zitsman JL](#)⁵.

[+](#) Author information

Abstract

Of adolescents in the United States, 20% have obesity and current treatment options prioritize intensive lifestyle interventions that are largely ineffective. Bariatric surgery is increasingly being offered to obese adolescent patients; however, large-scale effectiveness data is lacking. We used MEDLINE, Embase, and Cochrane databases, and a manual search of references to conduct a systematic review and meta-analysis on overall weight loss after gastric band, gastric sleeve, and gastric bypass in obese adolescent patients (age ≤19) and young adults (age ≤21) in separate analyses. We provided estimates of absolute change in body mass index (BMI, kg/m²) and percent excess weight loss across 4 postoperative time points (6, 12, 24, and 36 mo) for each surgical subgroup. Study quality was assessed using a 10 category scoring system. Data were extracted from 24 studies with 4 having multiple surgical subgroups (1 with 3, and 3 with 2 subgroups), totaling 29 surgical subgroup populations (gastric band: 16, gastric sleeve: 5, gastric bypass: 8), and 1928 patients (gastric band: 1010, gastric sleeve:

Weight Loss in Adolescents After Bariatric Surgery: A Systematic Review.

Karasko D¹.

Author information

- 1 Danielle Karasko, Doctoral Candidate, University of Missouri, Columbia, MO, and Pediatric Nurse Practitioner, Children's Hospital of Philadelphia, Philadelphia, PA.. Electronic address: karaskod@email.chop.edu.

Sleeve

Seven studies reported on comorbid conditions in patients undergoing the sleeve procedure (Cozacov et al., 2014; Ejaz et al., 2016; Inge et al., 2015; Jaramillo et al., 2017; Pedrosa et al., 2015; Serrano et al., 2016; Sugerman et al. 2003). Cozacov et al. reported comorbid conditions in conjunction with individuals undergoing bypass surgery. Results could not be differentiated by procedure type and are discussed in the bypass section. Sugerman et al. (2003) reported comorbid conditions before surgery but did not report postoperative results. Improvements in glucose levels were observed in three of four studies evaluating diabetes mellitus Type II (Ejaz et al., 2016; Inge et al., 2015; Jaramillo et al., 2017; Serrano et al., 2016). Three of four studies reported improvement in hypertension after surgery (Ejaz et al., 2016; Inge et al., 2015; Jaramillo et al., 2017; Serrano et al., 2016). Abnormal lipid levels were evaluated by four studies and reported in the following ways: hyperlipidemia, individual components (triglycerides and high-density lipoprotein [HDL] cholesterol) and dyslipidemia. All studies reported improvements, with one study observing reduced levels of HDL cholesterol (Ejaz et al., 2016; Inge et al., 2015; Jara-

outcomes. Bariatric surgery is safe for the adolescent; however, there are a paucity of data regarding long-term results and complications. Further research is needed draw definitive conclusions regarding outcomes and complication rates. Researchers should report outcomes using a standardized approach in data collection, and definitions of comorbidities should be standardized to facilitate comparisons across studies. Finally, multicenter studies would result in larger numbers of participants and allow for more definitive conclusions in outcomes, complications, and improvement in comorbidities.

Bariatric surgery is safe for the adolescent; however, there are a paucity of data regarding long-term results and complications.

Introduction

- MGB/OAGB gained wide and rapid popularity with high safety and efficacy in weight loss and sustained resolution of co-morbidities [1].
- In the pediatric age group, and in spite of encouraging experience reported by us, as well as other authors, bariatric surgery (specially MGB/OAGB)is still debated, since the **reports of long term results are few** [2].

1. ASMBS Clinical Issues Committee. Updated position statement on sleeve gastrectomy as a bariatric procedure. Surg Obes Relat Dis 2012;8:e21–6

1. Alqahtani AR, Elahmedi MO, Al Qahtani A. Co-morbidity resolution in morbidly obese children and adolescents undergoing sleeve gastrectomy. Surgery for Obesity and Related Diseases. 2014 Sep 1;10(5):842-50.



Introduction

In our study we were aiming to report the long-term results (5-9 years) of MGB/OAGB in adolescents, In order to:

- Add a new long-term study.
- Report both EWL and comorbidities progression.
- Report the Impressive changes that we have noticed in the adolescents' health life.



Methods

Retrospective Review of:

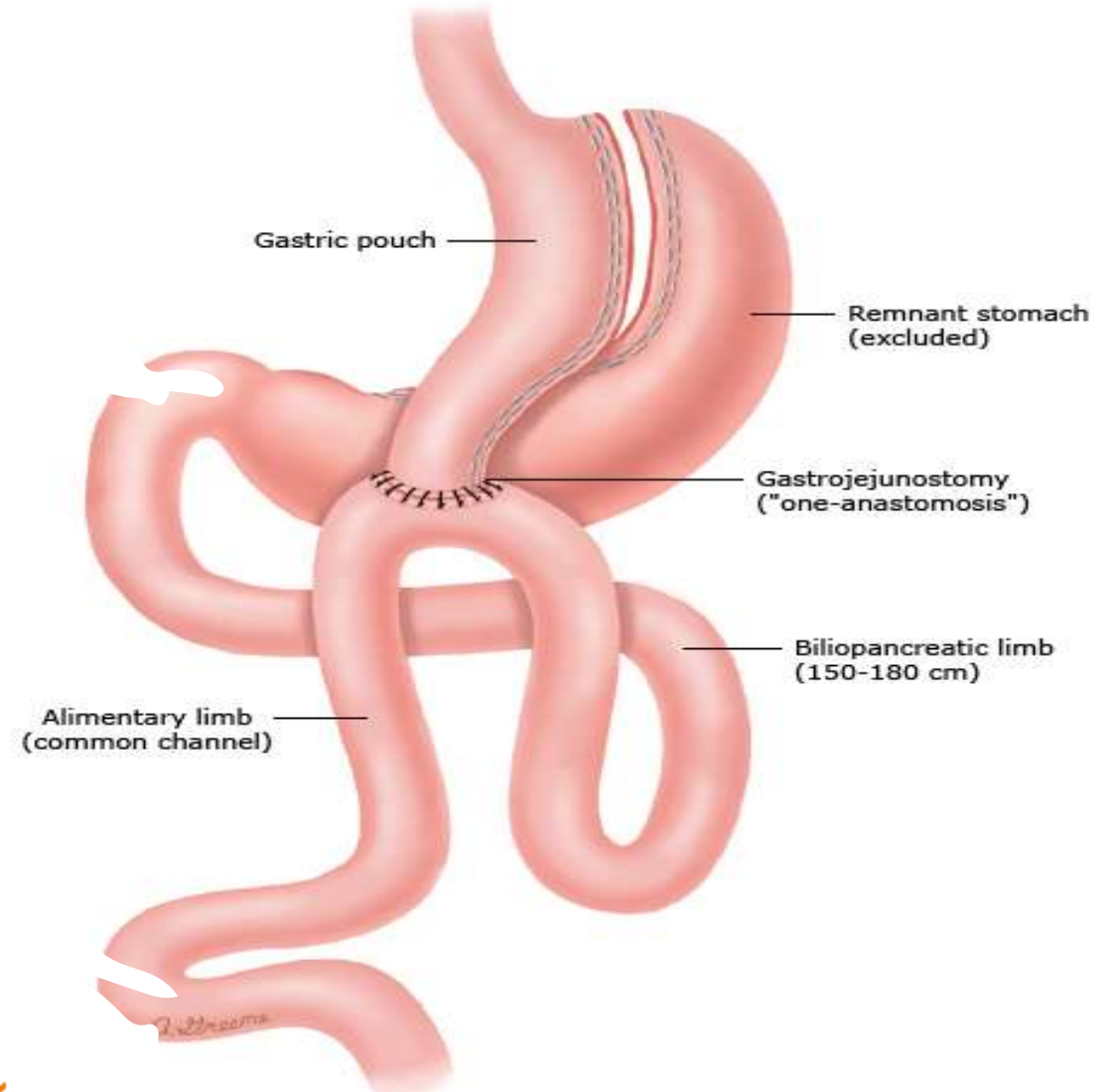
- **57 adolescent** patients who underwent MGB/OAGB.
- Beirut - Lebanon
- Between January 2013 and September 2017.

Methods

- All included patients underwent a complete assessment by a multidisciplinary team (MDT) including a nutritionist, psychologist, pediatric/endocrinologist, cardiologist, pulmonologist, and bariatric surgeon.
- Decision was taken by multidisciplinary team recommendation, with parents and patients' approval

Methods

- One anastomosis gastric bypass in our study was done by **laparoscopic** approach, making a lesser curvature based gastric pouch at **least 18cm** in length from the Gastroesophageal junction (GEJ) over a **40 French** oral tube using multiple firings of 60mm linear stapler, and the gastrojejunostomy by **60mm linear stapler, bypassing 180 cm** of small bowel.
- Petersen's defects were not closed in all cases.



Methods

- Weight loss
- Improvement or resolution of comorbidities

Statistical Analysis

- Data were analyzed using SPSS.
- Statistical significance was defined as $P < 0.05$.

Results

Table 1: Patients characteristics

Variable		Total N= 57
Year	2013 (9 years)	3(5.3%)
	2014 (8years)	6 (10%)
	2015 (7 years)	17 (29.8%)
	2016 (6 years)	14 (24.6%)
	2017 (5 years)	17 (29.8%)
Gender	Male	11(19.3)
	Female	46(80%)
Age		16.5±1.4

Original number is 73
-16 patients were lost to follow up

Results

- Table 2: Changes of weight, BMI and excess weight loss over time

Characteristics	Initial	3 months	6 months	1 year	2 years	3 years	4 years	current
Patients followed (number %)	57 (100.0)	57 (100.0)	57 (100.0)	57 (100.0)	57 (100.0)	57 (100.0)	57 (100.0)	57 (100.0)
Weight (KG) Range	89.0-160.0	78.0-142.0	71.0-128.0	69.0-118.0	68.0-106.0	63.0-97.0	65.0-98.0	70.0-97.0
BMI Range	34.3-53.5	29.0-47.4	26.1-42.8	25.3-37.6	25.2-34.6	24.0-31.6	24.8-33.9	26.0-33.6
Excess weight loss Range[min-max]	-	7.4-65.0	29.4-90.5	41.3-97.0	52.8-98.6	50.4-107.6	13.4-101.7	39.1-92.6

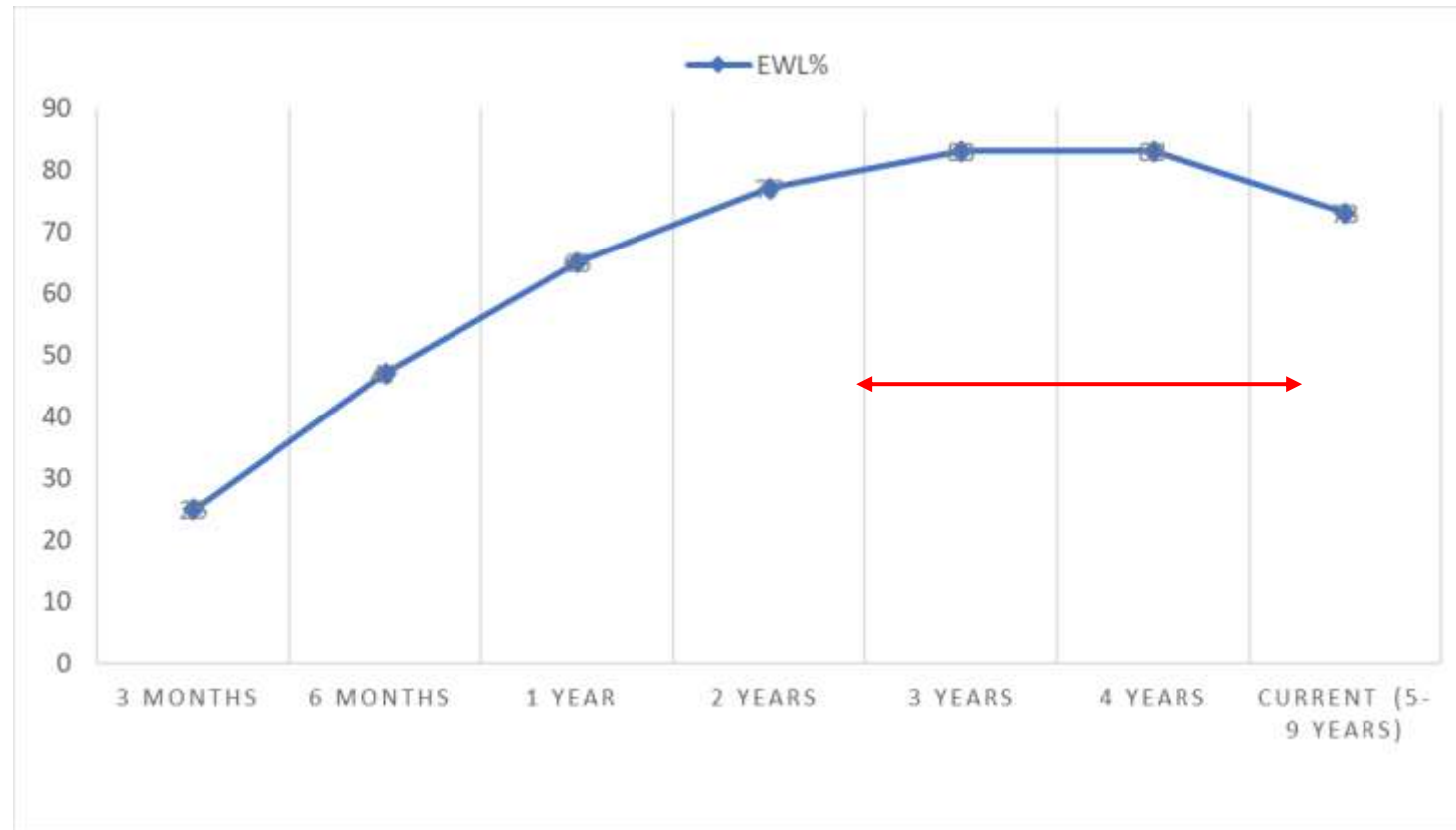
Results

- Table 4: Mean % excess weight loss over time (using one sample t-test)

	Mean (\pm SD)	p-value
3 months excess weight loss	25.1 (\pm 9.2)	<.001
6 months excess weight loss	47.2 (\pm 11.9)	<.001
1 year excess weight loss	65.8 (\pm 12.5)	<.001
2 years excess weight loss	77.7 (\pm 11.1)	<.001
3 years excess weight loss	83.5 (\pm 10.5)	<.001
4 years excess weight loss	83.6 (\pm 14.9)	<.001
Current excess weight loss	73.5 (\pm 11.5)	<.001

Results

- 83% of mean excess weight loss was maintained at 4 years and reached 73% between 5-9 years of surgery which was comparable to what was mentioned in adult studies.



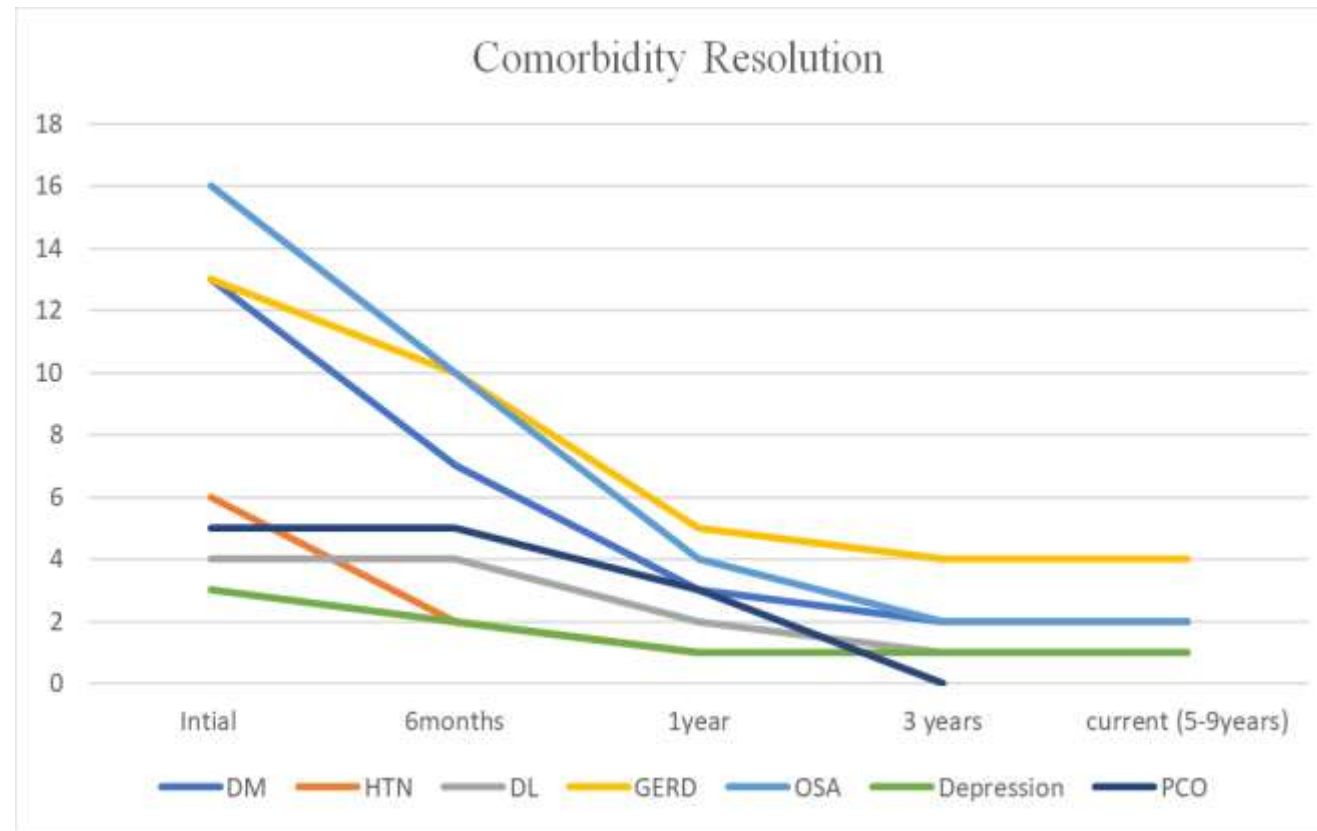
Results

Table 3: Resolution of several obesity related comorbidities over time

Characteristics	Initial	3 months	6 months	1 year	2 years	3 years	Current
Diabetes (DM)	4 (7.1)	3 (5.2)	3 (5.2)	2 (3.5)	2 (3.5)	1 (1.8)	1 (1.8)
Hypertension (HTN)	6 (10.5)	6 (10.5)	2 (3.5)	1 (1.8)	1 (1.8)	1 (1.8)	1 (1.8)
Dyslipidemia (DL)	4 (7.0)	4 (7.0)	4 (7.0)	2 (3.5)	1 (1.8)	1 (1.8)	1 (1.8)
GERD	13 (22.8)	10 (17.5)	10 (17.5)	5 (8.8)	4 (7.0)	4 (7.0)	4 (7.0)
Asthma	4 (7.0)	4 (7.0)	4 (7.0)	3 (5.3)	3 (5.3)	3 (5.3)	3 (5.3)
Depression	3 (5.3)	3 (5.3)	2 (3.5)	1 (1.8)	1 (1.8)	1 (1.8)	1 (1.8)
Obstructive sleep apnea (OSA)	16 (28.1)	16 (28.1)	10 (17.5)	4 (7.0)	2 (3.5)	2 (3.5)	2 (3.5)
Poly cyst ovarian syndrome (pcos)	5 (8.8)	5 (8.9)*	5 (8.8)	3 (5.3)	0 (0.0)	0 (0.0)	0 (0.0)

Results

Resolution of several obesity related comorbidities over time



Discussion Weight Loss

- The average %EWL achieved by our patients at 5, 6, 7,8 and 9 years was 73%.
- Those results are similar to published results from different **studies on adults and maybe superior to sleeve results.**

Discussion Comorbidities

- Studies of laparoscopic sleeve gastrectomy in the adult population show significant improvement and resolution in several obesity related comorbidities ranging from 40% to 80.9% (1).
- In our study, resolution rates reaches up to 100% at 5 to 9 years postoperatively.
- *This in line with published results from different studies on MGBOAGB in the adolescent population*

1. Alexandrou A ,Athanasίου A, Michalinos A, Felekouras E, Tsigris C, Diamantis T. Laparoscopic sleeve gastrectomy for morbid obesity: 5-year results. *Am J Surg* 2015; 209(2): 230-4.

Discussion Gerd

- Gerd was decreased but de novo gerd was noticed in 3 new patients
- However, all patients were treated by ppi

Discussion Complications

- The types of complications observed in our adolescents were similar to those which would be expected for morbidly obese adults undergoing bariatric surgery;
- One patient had pneumonia
- 2 had bleeding (conservative management only)
- One case of bile leak was reported
- However, no internal or incisional hernias were seen.

Discussion Complications

- Malnutrition or hypo-nutrition was not seen.
- Vitamin **deficiency and anemia** were the most common complication during the follow up period all managed by iron and vitamin replacement without admission.
- Symptomatic gallbladder stones and weight regain were seen in 1 patient each
- One patient was admitted for depression.

Conclusion

On a long term follow up,

MGB/OAGB showed effectiveness and safety in treating adolescents' obesity by significant reduction in excess weight loss and resolution, remission or improvement of associated comorbidities with a good safety profile in terms of malnutrition and reflux, however more data is needed to prove



Thank you

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Resolution of all co-morbidities was evaluated clinically and biochemically at each follow-up visit.



Dm

Remission of diabetes mellitus was defined as attaining a sustained fasting plasma glucose (FPG) level below 7.0 mmol/L, and HbA1c level below 6.5% while not on antidiabetes medication.

On the other hand, improvement of diabetes was defined as a decrease in FPG and HbA1c without reaching normal levels, and a decrease in the dose or frequency of antidiabetes medication(s) previously prescribed.

DL

- For dyslipidemia, a level of 2.8 mmol/L for low- density lipoprotein(LDL)and 41.2 mmol/L for high- density lipoprotein (HDL) were considered as remission,
- remission of hypertriglyceridemia was defined as reaching a value with in normal range for age (below .8 mmol/L for children below 10 yr of age,or below 1.0 mmol/L forthose10yr of age and older)



GerdQ Questionnaire

SYMPTOM	HOW MANY TIMES DOES THIS OCCUR PER WEEK?			
	0 DAYS	1 DAY	2 OR 3 DAYS	4 TO 7 DAYS
Burning feeling behind the breastbone (heartburn)	0	1	2	3
Stomach contents moving up to the throat or mouth (regurgitation)	0	1	2	3
Pain in the middle of the upper stomach area	3	2	1	0
Nausea	3	2	1	0
Trouble getting a good night's sleep because of heartburn or regurgitation	0	1	2	3
Need for over-the-counter medicine for heartburn or regurgitation (such as Tums, Roloids, Maalox, or other antacids), in addition to the medicine your doctor prescribed	0	1	2	3

NOTE: Add the point values for each corresponding answer. Total score of 0 to 2 points = 0 percent likelihood of GERD; 3 to 7 points = 50 percent likelihood; 8 to 10 points = 79 percent likelihood; 11 to 18 points = 89 percent likelihood.

GERD = gastroesophageal reflux disease.

Adapted with permission from Jones R, Junghard O, Dent J, et al. Development of the GerdQ, a tool for the diagnosis and management of gastroesophageal reflux disease in primary care. Aliment Pharmacol Ther. 2009;30(10):1034.

This study had some limitations. Because of the retrospective design, we were unable to assess other obesity-associated comorbidities, such as polycystic ovarian syndrome, osteoarthritis, and musculoskeletal symptoms, or any postoperative improvements of these conditions. Similarly, it would have been beneficial to have assessments of the patients' post-LSG physical activity and objective assessments of the resolution of symptoms of GERD and OSA, although for OSA, the number of adolescents using BI-PAP regularly for their OSA had decreased at 6–12 months postoperatively because some of the adolescents had completely stopped BI-PAP. Our



**On a long term follow up,
Sleeve Gastrectomy showed effectiveness
and safety in treating adolescents' obesity
by significant reduction in excess weight
loss and resolution , remission or
improvement of associated co-
morbidityes.**



Conclusion

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