



Outcome of Adolescents Undergoing Sleeve Gastrectomy – One Year Follow-up

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Introduction

- Adolescent obesity has been steadily increasing over the developed world for the past several decades. In Israel 27-30% of adolescents ages 10-14 years are overweight and about 10-13% are obese.
- The prevalence of morbid obesity is also increasing. Studies undertaken in the United States estimated that 1.3-2.8% of 12-19 years olds have BMI >40 kg/m² or BMI > 35 kg/m² with serious comorbidities.
- Bariatric surgery in adolescents is increasing in popularity.
- The main surgical technique that is done on adolescents in Israel is a laparoscopic sleeve gastrectomy.

Aim

- To describe the clinical and laboratory outcomes of adolescent patients one year after they underwent sleeve gastrectomy.

Methods

- Anthropometric clinical and laboratory data were obtained from all patients age 13-19 years old who had bariatric surgery between Jan 2010 and March 2015 in Edmond and Lily Safra Children's hospital, Sheba Medical Center, Israel.

Results

- The study population comprised of 32 adolescents (M=18/F=14)
- Their mean±SD age at surgery was 16.5±1.36 years (range 13.7-18.6). Anthropometric and baseline laboratory data are presented in Table 1.
- Mean follow up after the surgery was 13.7±7.6 (range 3-36) months.

- After one year follow-up BMI decreased from 46.85 kg/m² to 32.4 kg/m² BMI z score was reduced from 2.78 to 1.87. (p<0.001). (Figure 1)
- Weight loss was more significant in males (p=0.0009) and with older age, above 17 year (p=0.0415) (Figure 2 A,B)
- Patients with HOMA-IR >4 before the surgery reduced less weight (p=0.0049). (Figure 2 C)

Table 1 - Anthropometric and laboratory data at baseline

	Mean ±sd	Range	% Pathological
Age (years)	16.5±1.36	13.7-18.6	
Weight (Kg)	129.8±17	100-165	
BMI (kg/m ²)	46.85± 5.6	39-66	
BMI-Z score	2.86± 0.27	2.33-3.3	
Systolic BP(mmHg)	127±12	98- 157	
Diastolic BP(mmHg)	76±11	50- 102	
Hypertension treatment			6
Total cholesterol(mg/dL)	156±30	112-233	6.6
Triglycerides(mg/dL)	128±57	62-256	34
HDL(mg/dL)	38±6	28-55	56
LDL(mg/dL)	100±22	68-150	10.3
Fasting glucose(mg/dl)	88±13	61-117	15.6
HBA1C(%)	5.6±0.5	4.9-6.5	60
Fasting insulin (mIU/ml)	32±35	4.7-190	34
HOMA-IR	6.9±9.2	0.9-49.2	55
Glucophage treatment			12.9
Metabolic syndrome*			65
GOT(U/L)	27±10	17-68	12.5
GPT(U/L)	37±23	13-121	34
Fatty liver by US			56
Obstructive sleep apnea			28
Pseudo tumor cerebri			6

* Metabolic syndrome that was characterized as TG> 150 mg/dl, HDL< 40mg/dl, HTN> 130/85, elevated fasting glucose> 100mg/dl or medication for diabetes (at least 2/4)

Figure 1- BMI and BMI Z SCORE reduction

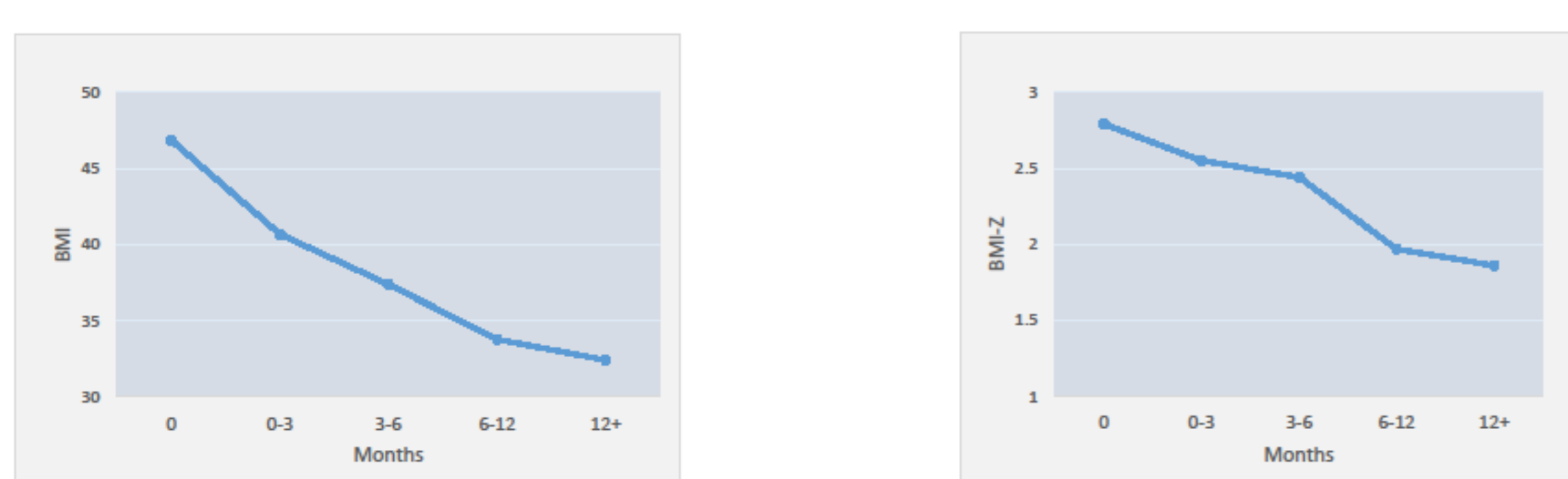
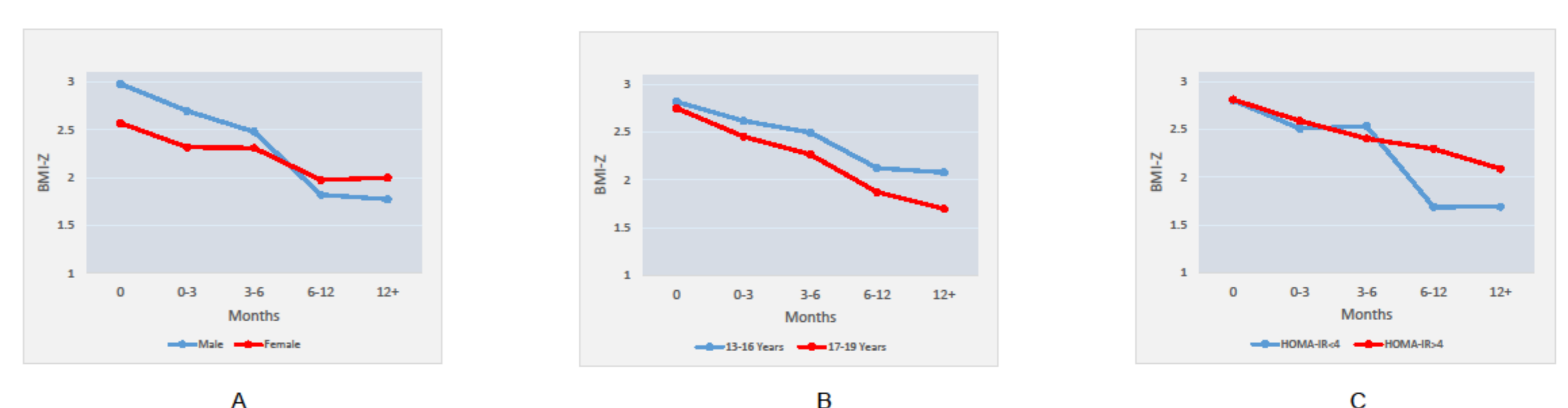


Figure 2- BMI reduction by gender, age and HOMA-IR



- During follow-up most obesity related comorbidities have resolved. Dyslipidemia resolved in 73% of the patients (p <0.0001), HTN resolved in 80% (P=0.0005) and metabolic syndrome present in 65% of the patients before surgery resolved completely.
- Nevertheless there were severe complications that developed after the surgery including readmission (20%), symptomatic cholelithiasis requiring laparoscopic cholecystectomy (16%), nonspecific eating disorders in 2 patients, one patient developed paralysis secondary to severe vitamin B1 deficiency.
- Three of our patients were re-scheduled for re-operation (one had roux and Y bypass and two had re- sleeve gastrectomy).

Conclusions

- Sleeve gastrectomy in adolescents significantly improves BMI and obesity associated comorbidities after one year of follow-up.
- Weight loss reduction is greater in males and older adolescents and less in patients with insulin resistance.
- Despite significant weight loss, bariatric surgery in adolescents is associated with significant long-term morbidity.

