Diagnosis and Management of Obesity and its Comorbidities in Childhood – the View of a Pediatric Gastroenterologist

Javier Monagas MD
Assistant Professor of Pediatrics
Pediatric Gastroenterology Hepatology and Nutrition
LSU Health Sciences Center New Orleans
Children’s Hospital of New Orleans
Objectives

- Recognize the complications of obesity in childhood and the indications for referral to a gastroenterologist
- Know the indications, approach and outcomes for surgical treatment of obesity in childhood
- Be familiar with the NASPGHAN strategies and recommendations for adolescents who are candidates for bariatric surgery
- Explore the nonsurgical options (including new endoluminal suturing) for treatment of obesity in childhood
Disclosure

Nothing to disclose
Report: Millions Of Courageous Americans Overcoming Media Pressure To Be Thin

“...“Given the media’s clear preference for thin physiques, we expected most Americans would be actively seeking to emulate such body types, but we found that nearly 7 in 10 American adults possess the inner courage and determination to overcome the constant pressure to maintain a trim figure,” said behavioral psychologist and the report’s co-author Olivia Trumbull, noting that these Americans boldly ignored, on average, 10 to 14 images of in-shape individuals every minute of the day...”
Obesity

Definition?
Who is at risk?
What are the complications?
Overweight is defined as having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors.¹

Obesity is defined as having excess body fat.

Obesity being classified as a body mass index (BMI) above the 95th percentile.²

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According to National Health and Nutrition Examination Survey 2009–2010, about 1 in 6 American children ages 2–19 are obese. The survey also suggests that overweight and obesity are having a greater effect on minority groups, including Blacks and Hispanics.
Obese adolescents have a 50% to 77% risk of becoming obese adults.

With 1 obese parent increases to approximately 80% \(^3 - 7\).

What is happening here?
Recognize the complications of obesity in childhood and the indications for referral to a gastroenterologist
Great risk of complications

Psychosocial
- Poor self esteem
- Depression
- Quality of life

Neurological
- Pseudotumor cerebri
  - Risk for stroke

Cardiovascular
- Dyslipidemia
- Hypertension
- Left ventricular hypertrophy
- Chronic inflammation
- Endothelial dysfunction
  - Risk of coronary disease

Pulmonary
- Asthma
- Sleep apnea
- Exercise intolerance

Renal
- Glomerulosclerosis
- Proteinuria

Gastrointestinal
- Pancreatitis
- Steatohepatitis
- Liver fibrosis
- Gallstones
  - Risk for cirrhosis
  - Risk for colon cancer

Endocrine
- Type 2 diabetes
- Precocious puberty
- Polycystic ovary syndrome (girls)
- Hypogonadism (boys)

Musculoskeletal
- Forearm fracture
- Blount's disease
- Slipped capital femoral epiphysis
- Flat feet
  - Risk for degenerative joint disease

Hernia

DVT/PE

Stress incontinence
  - Risk of GYN malignancy
GI Complications

- Gastroesophageal Reflux Disease (GERD)
- Non Alcoholic Steatohepatitis (NASH)
- Non Alcoholic Fatty Liver Disease (NAFLD)
- Gallstones
- Functional constipation
- Functional Gastrointestinal disorders
Symptoms of GERD overlap with several functional GI disorders like Functional Dyspepsia or Rumination Syndrome

Response to acid suppression alone is not diagnostic

Esophagogastroduodenoscopy and pH probe with or without impedance are required for accurate diagnosis
Approximately 38% of obese children and adolescents have steatosis compared with 5% of lean subjects.

About 9% have nonalcoholic steatohepatitis (NASH) compared with 1% of the lean population.

Pathology of liver disease

- Normal liver
- Fatty liver
- Steatohepatitis
Diagnose and manage liver disease

- Liver enzymes and synthetic function of the liver
- Perform liver biopsy
- Metformin Vs. Vitamin E
Although risk factors for progression of steatosis and NASH to cirrhosis are not fully understood, steatosis and inflammatory markers improved and hepatic fibrosis regressed after bariatric surgery in some patients.

NASH should be an indication for bariatric surgery in adolescent patients.


Symptom-based diagnosis. There are no tests.

Functional Constipation, Dyspepsia, Irritable Bowel Syndrome & Functional Abdominal Pain
Know the indications, approach and outcomes for surgical treatment of obesity in childhood
Update

ASMBs pediatric committee best practice guidelines

Marc Michalsky, M.D., F.A.C.S., F.A.A.P.\textsuperscript{a,*}, Kirk Reichard, M.D., F.A.C.S., F.A.A.P.\textsuperscript{b}, Thomas Inge, M.D., F.A.C.S., F.A.A.P.\textsuperscript{c}, Janey Pratt, M.D., F.A.C.S.\textsuperscript{d}, Carine Lenders, M.D., F.A.A.P.\textsuperscript{e}

\textsuperscript{a}Chair, American Society for Metabolic and Bariatric Surgery Pediatric Committee, Gainesville, Florida
\textsuperscript{b}Co-Chair, American Society for Metabolic and Bariatric Surgery Pediatric Committee, Gainesville, Florida
\textsuperscript{c}Immediate Past Chair, American Society for Metabolic and Bariatric Surgery Pediatric Committee, Gainesville, Florida
\textsuperscript{d}Committee Member, American Society for Metabolic and Bariatric Surgery Pediatric Committee, Gainesville, Florida
\textsuperscript{e}Department of Pediatrics, Boston Medical Center, Boston, Massachusetts

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NASH should be an indication for bariatric surgery in adolescent patients.

Patients need to be evaluated and screened to be candidates for weight loss surgery (WLS)

Multidisciplinary team:
- Adolescent and/or pediatric endocrinologist
- Pediatric gastroenterologist
- Pediatric bariatric surgeon
- Dietician
- Exercise physiologist or physical therapist
- Psychologist
- Psychiatrist
- Social worker
- Nurse coordinator
Obesity program pre surgery

- Weight loss goal of 1 to 2 pounds a week
- Assessment of motivation, family involvement and support
- Assessment and treatment of psychiatric comorbidities
- Maintain regular plan of exercise
- Maintain dietary diary
- Treat comorbidities
- Medications
Indications for Surgery

- NASH
- Type 2 diabetes
- Moderate or severe obstructive sleep apnea
- Pseudotumor cerebri
- CVD risk factors
- Metabolic syndrome

Bariatric surgery might improve the emotional health and quality of life in adolescents

Michalsky et al., American Society for Metabolic and Bariatric Surgery M. pediatric committee best practice guidelines. Surgery for Obesity and Related Diseases 2012 Jan-Feb;8[1]:1-7
Many obese adolescents seeking weight management treatment present with symptoms of depression

Depression is not an exclusion criterion for bariatric surgery

Depression before bariatric surgery does not affect the rate of weight loss after surgery

Depression improves after bariatric surgery

Adolescents with depression require monitoring for recurrence of depression after surgery

Eating disorders

- Binge eating and self-induced purging occur in 5–30% of obese adolescents seeking bariatric surgery.
- Such eating disturbances before bariatric surgery do not affect weight loss after surgery in adult cohorts, at least in the short term.
- Therefore, although not studied specifically in adolescents seeking bariatric surgery, the presence of eating disturbances is not an exclusion criterion.
- If an eating disorder is identified, treatment should be initiated and the patient should be considered stable before bariatric surgery.

Be familiar with the NASPghan strategies and recommendations for adolescents who are candidates for bariatric surgery

*Michell A. Fullmer, †Stephanie H. Abrams, ‡Kathleen Hrovat, §Lori Mooney, ¶Ann O. Scheimann, ††Jennifer B. Hillman, and ¶¶David L. Suskind

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Nutritional assessment and education in preparation for weight loss surgery

- Initial nutritional assessment
- Nutrition education regarding food quality choices
- Nutrition education regarding food quantity choices for preoperative energy needs
- Nutrition education regarding liquid meals
- Review of accuracy of liquid meal plans and, if adequate, then nutrition education regarding smooth food meal plans
- Review of smooth food meal plans and, if adequate, review of questions/concerns regarding post op meal plans
Roux-en Y gastric bypass

http://www.merckmanuals.com/professional/nutritional_disorders/obesity_and_the_metabolic_syndrome/bariatric_surgery.html
Adjustable gastric band

http://www.merckmanuals.com/professional/nutritional_disorders/obesity_and_the_metabolic_syndrome/bariatric_surgery.html
Comparison of weight loss for gastric bypass versus gastric band over time

Note. Success was defined as ≥ 40% EWL. The sample sizes reported below each bar are associated with the number of patients who had successful weight loss for each respective operative technique per period.
Sleeve gastroplasty
Average excess weight lost after bariatric surgery

- Bypass
- Sleeve
- Lap Band

Months after Bariatic Surgery
Decrease Ghrelin = Decrease hunger
Increase PYY = Increase satiety
Increase GLP-1 = Increase satiety
The consortium was funded in June 2006 under a cooperative agreement (U01) by the National Institute of Diabetes, Digestive and Kidney Disorders.

The Teen-LABS consortium members include:

- Cincinnati Children’s Hospital Medical Center
- Texas Children’s Hospital
- Children’s Hospital of Alabama
- University of Pittsburgh
- Nationwide Children’s Hospital
Explore the nonsurgical options (including new endoluminal suturing) for treatment of obesity in childhood
Intragastric Balloons

Adjustable Totally Implantable Intragastric Prosthesis (ATIIP), Endogast, Courtesy of Districlass Médical.

Heliosphere Bag, Courtesy of Allergan/Helioscopie Medical Implants.
The EndoBarrier by GI Dynamics, Courtesy of GI Dynamics
PRACTICAL GASTROENTEROLOGY • NOVEMBER 2009
PATIENTS: 10 girls and two boys 14 to 17 years old, mean age-adjusted body mass index at baseline was 38.1 (SD 7.7).

Results:
The outpatient procedures were performed in approximately 40 minutes
After 1 months 18% reduction of excess body weight
After 3 months=39%
After 6 months=62%
New approach

Endoscopic sleeve gastroplasty: a potential endoscopic alternative to surgical sleeve gastrectomy for treatment of obesity

Barham K. Abu Dayyeh, MD, MPH, Elizabeth Rajan, MD, Christopher J. Gostout, MD
Rochester, Minnesota, USA

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Comparison diagram

**Surgical Sleeve Gastrectomy**

**Endoscopic Sleeve Gastroplasty**

**Figure 1.** Surgical sleeve gastrectomy compared to endoscopic sleeve gastroplasty.
Figure 2. Endoscopic suturing system used in our study.
Up to 3 months after

Figure 6. Stomach before, immediately after, and at 3 months after endoscopic sleeve gastroplasty showing an intact sleeve.
Primary Obesity Surgery, Endoluminal (POSE)
AspireAssis
Weight loss surgery is just part of multidisciplinary approach to treatment that includes lifestyle changes, dietary changes, and attention to physical and emotional co-morbidities.

Adolescent bariatric surgery will achieved status of standard community care.

New, less invasive, reversible endoscopic approaches are promising but research is needed.