

Bariatric Surgeons Lower BMI Bar for Teens

BY MITCHEL L. ZOLER

The criteria for selecting obese adolescents as candidates for bariatric surgery have loosened in recent years, say some surgeons, while other surgeons had already applied the looser criteria for several years. Now that the adolescent field has converged on a roughly uniform body mass index standard that's the same as for adults—at least 35 kg/m² with serious comorbidities or at least 40 kg/m² in other patients—surgeons have begun to consider testing an even more aggressive approach to bariatric surgery in teenagers.

The goal, they agree, is to offer bariatric surgery to adolescents (usually defined as patients aged 13-17 years) safely but at a stage when the surgery has the best potential to normalize patients' weight so that comorbidities improve and possibly resolve.

An aggressive approach may also help avoid another problem. "No one can explain why, but there is a plateauing effect



Diabetes, sleep apnea, and nonalcoholic steatohepatitis are 'reversible' with bariatric surgery in adolescents.

DR. PRATT

of all bariatric surgery, be it gastric bypass, gastric sleeve, or gastric banding. Patients lose about 15 BMI [body mass index] points but no more," said Dr. Evan P. Nadler, director of the bariatric surgery program at Children's National Medical Center in Washington. "The chances of getting patients near a normal body weight once they reach a BMI of 45 or 50 are quite small."

The reasons behind this limit to the effect of bariatric surgery remain elusive. Many surgeons believe that the adaptable human body kicks in a thermostatlike resetting that maintains a certain body weight starting about a year after the large initial loss following surgery. Another factor may be that many patients have lifestyle regression at some point after surgery.

Regardless of the cause, the apparent limit to weight loss for most patients suggests to pediatric surgeons that bariatric surgery has the greatest potential to normalize BMI, and thereby prevent comorbidities, when applied relatively early, before BMI grows too high and before end-organ damage is irreversible.

"If you get to younger patients, they may still be in a window of opportunity for their end-organ disease to essentially be reversed," Dr. Marc P. Michalsky said. "Our hope is that perhaps in adolescents, without decades of cardiac disease, hypertension, and liver disease, once their weight is off you may see more resolution of that disease than in adults. That's the hypothesis, but we

haven't proven it yet," said Dr. Michalsky, surgical director of the center for healthy weight and nutrition at Nationwide Children's Hospital in Columbus, Ohio.

"It's a new concept to think of surgery as preventive medicine, but it is preventive in the sense that patients have more severe comorbidities if you wait," said Dr. Ai-Xuan Holterman, director of pediatric surgery at Rush University Medical Center in Chicago.

"You could argue that in a 14-year-old who is obese but has no comorbidities, there is no urgency to do surgery. But we know what the natural trajectory of these patients will be. If a patient is older than 14 and morbidly obese, even if their comorbidities are relatively minor, I think that surgery is an appropriate option," Dr. Nadler said in an interview.

Another benefit of early surgery is that "the risk of operating on a patient at a BMI of 45 is a lot different than operating on someone with a BMI of 60," he added.

Still, U.S. studies have yet to report outcomes from bariatric surgery in adolescents at more than 3 years of follow-up.

A series of 61 patients, with an average age of 17, underwent gastric bypass surgery (Roux-en-Y) at Cincinnati Children's Hospital Medical Center between August 2002 and January 2007. Researchers divided the group into three subsets based on their BMI at the time of surgery: 23 had a BMI of 40-54.9 kg/m², 21 had a BMI of 55-64.9 kg/m², and 17 had a BMI of 65 kg/m² or greater. One year after surgery, the average BMIs were 31, 38, and 47 kg/m², respectively.

Ten of the patients had reached a BMI out of the obese range, less than 30 kg/m²; eight of them came from the group that began with a BMI of less than 55 kg/m² at baseline (the average baseline BMI in this subgroup was 50 kg/m²). The analysis also showed that the average percentage of lost BMI was similar in all three subgroups, about 37%, and that two-thirds of the variance in BMI 1 year after surgery was attributable to the variance in baseline BMI (J. Pediatr. 2010;156:103-8).

The shift in surgical criteria for adolescents means that most surgeons now follow the same guidelines that have been standard for adult patients for nearly 2 decades. Serious comorbidities that lower the threshold to 35 kg/m² are type 2 diabetes, severe steatohepatitis, pseudotumor cerebri, or moderate to severe obstructive sleep apnea.

In 2004, a group of surgeons who at the time primarily favored gastric bypass for their adolescent patients published recommendations that called for limiting bariatric surgery for adolescents to those with a BMI of at least 40 kg/m² with a serious, obesity-related comorbidity or a BMI of at least 50 kg/m² with less severe comorbidities (Pediatrics 2004;114:217-23). Last year, a surgeon from that group, Dr. Thomas H. Inge of Cincinnati Children's Hospital, worked with a different group of collaborators to write revised

criteria, which set their threshold BMI at 35 or 40 kg/m² depending on comorbidities (Obesity 2009;17:901-10).

Dr. Nadler and his associates published their own endorsement for applying the adult BMI criteria for bariatric surgery to adolescents in another paper that appeared last year (J. Pediatr. Surg. 2009;44:1869-76).

"What is crucial is that you're not operating just because of BMI or weight, but that there is a compelling health indication," said Dr. Inge, surgical director of the surgical weight loss program for teens at Cincinnati Children's. He cited



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preliminary evidence collected by his collaborators that, for example, "the pediatric heart may be more resilient to remodeling" than an adult's heart, and more likely to return to normal following significant weight loss. "There may be a window of opportunity to act before there is more permanent damage to the heart," Dr. Inge said in an interview. Similarly, "in teens, sleep apnea appears to resolve completely" something that usually does not occur in adults. "We tell parents [of obese teenagers] that the obesity will only get worse, and we have tried and true ways to try to reverse" the comorbidities.

Comorbidities that are "more or less reversible" with bariatric surgery in adolescents and are the most common indications for surgery are diabetes, sleep apnea, and nonalcoholic steatohepatitis. Others in this category include hypertension, pseudotumor cerebri, gastroesophageal reflux disease, asthma, and poor self-esteem, said Dr. Janey S.A. Pratt, a bariatric surgeon at Massachusetts General Hospital in Boston. However, she noted, other obesity-linked conditions are generally not reversible, including glomerulosclerosis of the kidney, gallstones, flat feet, major orthopedic deformities, precocious puberty, and some body-image issues. "The most important reason to operate on obese adolescents is not to decrease their weight, but rather to treat or prevent the comorbidities associated with excess weight," Dr. Pratt said. "Will all of the adolescents we operate on be obese as adults?" Dr. Pratt cited results from a recent study in which 100% of children with a BMI above the 99th percentile after age 10 years had BMIs greater than 35 kg/m² when they were adults.

A similar interest in early intervention in adolescents exists among surgeons whose focus is gastric banding, which along with gastric sleeves are the surgical alternatives to bypass. Unlike the surgeons who perform gastric bypass

surgery, those who do banding have consistently used adult criteria for surgical intervention in adolescent patients. The main limitation of banding has been that as of early 2010 neither of the band devices marketed in the United States for adults had received Food and Drug Administration approval for use in adolescents.

A few years ago, bariatric surgeons at New York University, Rush University, and elsewhere received FDA permission to perform gastric banding on adolescents on an investigational, off-label basis using adult entry criteria. Dr. Nadler, who was with the NYU program at the time, said that he and other surgeons who performed banding never saw a need to be more conservative in their patient-selection criteria than in adults because they viewed banding as less risky than bypass.

"Banding is less invasive and complications are lower and not as serious as with bypass," he said.

"Gastric bypass is considered more invasive than banding," agreed Dr. Holterman. Banding is reversible, and it also results in more gradual weight loss since it relies entirely on restricting gastric capacity rather than also on reducing absorption like bypass does, she noted. Dr. Holterman said she prefers an approach that tries banding first, reserving bypass as a later option if needed.

Regardless of which surgical approach



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is best, now that the field has arrived at a consensus that adolescent surgery is appropriate for patients with BMIs as low as 35 kg/m², the next question has become whether it is safe and makes clinical sense to perform surgery on adolescents with even lower BMIs, in the 30- to 35-kg/m² range.

Dr. Holterman said that she thinks starting a study of this approach is now reasonable.

The National Institutes of Health established the adult criteria in 1991, and they have not been revised since, Dr. Nadler noted. "I think the operation is safe enough that you can broaden the application. The adult criteria are expanding, and perhaps the adolescent criteria will expand, too." ■

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