

Surgical Treatment of Obesity in Adolescence

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ADOLESCENT OBESITY IS A VEXING PROBLEM FOR WHICH there are few good solutions. Obese children develop metabolic syndrome. Because the cardiovascular complications of metabolic syndrome result from many years of exposure to hyperglycemia, diabetes, hyperlipidemia, and hypertension, early onset of these problems portends significant disease later in life.¹ For these reasons, treating adolescent obesity is important.

How can sustained weight loss be achieved in children and adolescents? As with adults, effective treatments are lacking. Bariatric surgery has been proposed for children but remains controversial. Evidence in support of these operations is based on small-scale studies that have mostly emanated from single institutions reporting outcomes from small numbers of patients with inadequate follow-up.² Most studies have investigated gastric bypass-type procedures. Because these operations permanently alter the stomach, most clinicians are reluctant to advise these operations for children or adolescents except in the most compelling circumstances. Laparoscopic adjustable banding operations have become popular in recent years because these procedures can result in reasonable weight loss with relatively few complications and substantial potential for reversibility. As with adult bariatric surgery, the literature supporting the use of bariatric procedures is incomplete, causing policy makers to be hesitant in recommending this procedure for treatment of adolescent obesity.

In this issue of *JAMA*, O'Brien and colleagues³ report their findings regarding the use of the laparoscopic banding procedure in adolescents. This study is important not only in providing difficult-to-come-by level 1 evidence in support of bariatric surgery but also because the work demonstrates that randomized controlled trials can and should be conducted to evaluate surgical technologies.

The investigators randomized 50 obese adolescents to either receive a laparoscopic band or enroll in a medically supervised weight loss program. All participants received free care and those involved in the medical care group were offered an unusually intense program that included the pro-

vision of a personal trainer for 6 weeks. At 2 years of follow-up, there was substantial heterogeneity in weight loss outcomes for both groups with greater average weight loss for those receiving laparoscopic banding procedures. Even though weight loss was modest in the medical weight loss group, there was substantial improvement in hypertension, hyperlipidemia, and insulin resistance, demonstrating that lifestyle interventions are worthwhile even though they did not result in the amount of weight loss achievable with surgery.

Although adverse events were common in both groups, 8 reoperations were required among 7 of the 24 patients who had received laparoscopic banding. This finding is particularly important because O'Brien et al³ are among the most experienced group in the world with these operations, suggesting that these complication rates will probably be higher in actual community practice. This randomized controlled trial demonstrates that the decision to offer laparoscopic banding procedures to adolescents is not straightforward. Patients enrolled in this trial were obese but did not have particularly severe complications of their obesity. Medical intervention was successful at improving many of the metabolic complications of obesity, but improvements in the surgical group were greater and included a higher degree of quality of life. Surgery was also associated with greater weight loss, but that benefit was possibly offset by the high complication rate associated with the laparoscopic banding devices.

Even though this study by O'Brien et al³ raises many questions, it does answer some important ones. Laparoscopic banding procedures appear to be a feasible means for treating obesity in adolescents. The operation is known to require more patient compliance than Roux-en-Y gastric bypass (RYGB) surgery, and concerns have existed about the ability of teenagers to comply with the rigorous follow-up required to lose weight after laparoscopic banding placement. Because laparoscopically placed adjustable bands have fewer complications and are reversible, they represent a better alternative than RYGB

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for obese adolescents in need of surgical treatment for obesity.

The most important contribution of the report by O'Brien et al³ is providing another randomized controlled trial comparing bariatric surgery with nonsurgical treatments culminating in more level 1 evidence regarding bariatric surgery.⁴⁻⁶ The quality of evidence in support of bariatric surgery is poor,^{7,8} resulting in substantial controversy regarding its use for obesity treatment. Many insurance companies in the United States will not pay for bariatric surgeries, and their decision to not cover this treatment is based on the lack of compelling, universally accepted evidence in its favor. Studies such as the one by O'Brien et al³ go a long way toward providing the evidence necessary to evaluate the benefits and risks of bariatric surgery.

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REFERENCES

1. van Dam RM, Willett WC, Manson JE, Hu FB. The relationship between overweight in adolescence and premature death in women. *Ann Intern Med.* 2006;145(2):91-97.
2. Treadwell JR, Sun F, Schoelles K. Systematic review and meta-analysis of bariatric surgery for pediatric obesity. *Ann Surg.* 2008;248(5):763-776.
3. O'Brien PE, Sawyer SM, Laurie C, et al. Laparoscopic adjustable gastric banding in severely obese adolescents: a randomized trial. *JAMA.* 2010;303(6):519-526.
4. Dixon AF, Dixon JB, O'Brien PE. Laparoscopic adjustable gastric banding induces prolonged satiety: a randomized blind crossover study. *J Clin Endocrinol Metab.* 2005;90(2):813-819.
5. Dixon JB, O'Brien PE, Playfair J, et al. Adjustable gastric banding and conventional therapy for type 2 diabetes: a randomized controlled trial. *JAMA.* 2008;299(3):316-323.
6. O'Brien PE, Dixon JB, Laurie C, Anderson M. A prospective randomized trial of placement of the laparoscopic adjustable gastric band: comparison of the perigastric and pars flaccida pathways. *Obes Surg.* 2005;15(6):820-826.
7. Management of Overweight and Obesity. http://www.healthquality.va.gov/obesity_clinical_practice_guideline.asp. Accessed January 20, 2010.
8. Vetter ML, Cardillo S, Rickels MR, Iqbal N. Narrative review: effect of bariatric surgery on type 2 diabetes mellitus. *Ann Intern Med.* 2009;150(2):94-103.