

## Bariatric Surgery for High Risk Patients: First Staged Laparoscopic Biliopancreatic Diversion with Duodenal Switch for Severe Obesity

Andrei Keidar MD<sup>1</sup>, Nahum Begleibter MD<sup>3</sup>, Abed Chalaila MD<sup>1</sup>, Ram Elazary MD<sup>1</sup>, Chaya Schweiger<sup>2</sup> and Avraham Rivkind MD<sup>1</sup>

Departments of <sup>1</sup>Surgery and <sup>2</sup>Clinical Nutrition and Dietology, Hadassah Medical Center, Ein Kerem Campus, and <sup>3</sup>Department of Surgery, Hadassah Medical Center, Mount Scopus Campus, Jerusalem, Israel

**Key words:** super-super-morbid obesity, two-stage procedure, laparoscopic biliopancreatic diversion with duodenal switch

*IMAJ 2007;9:616–617*

The prevalence of obesity in the world is reaching epidemic proportions. Bariatric surgery is still the only effective treatment for severe obesity, a conclusion reached by the National Institute of Health Consensus Conference on the Surgery of Obesity in 1991 [1]. However, bariatric surgery carries substantial risks, especially in a subgroup of patients with a body mass index above 60, which is defined as super-super obesity.

Surgical treatment for this subgroup of patients has been a significant challenge, and consistent results in these patients have been difficult to attain. Weight loss failures (not achieving BMI < 40 kg/m<sup>2</sup>) in a group with BMI > 50 kg/m<sup>2</sup> have been reported in as many as 19–39% of patients undergoing gastric bypass [2,3]. The optimal weight loss in this group of patients can be achieved by means of biliopancreatic diversion with duodenal switch. This operation is technically challenging. Furthermore, patients present with complex metabolic derangements and severe organ dysfunctions due to complications of obesity, and partial immobility renders them at very high risk for any surgery. Since morbidity and mortality can be as high as 38% and 6.25% respectively with the one-stage procedure in this BMI group [4], a two-stage operative approach was devised. We report the case of a morbidly obese patient with a BMI of 75 kg/m<sup>2</sup> who was treated by a staged approach.

BMI = body mass index

### Patient Description

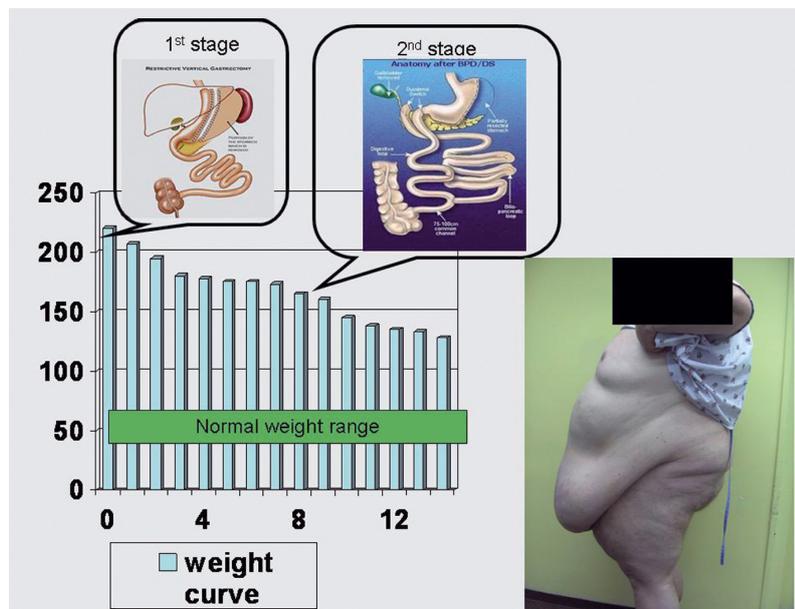
A 34 year old man who had been suffering from obesity since adolescence was referred to our clinic for surgical treatment. His weight and height were 220 kg and 171 cm respectively, and his BMI was 75 kg/m<sup>2</sup>. He had a prominent “central”-type obesity with a large abdominal apron [Figure]. His history included multiple attempts to lose weight in the framework of organized diet and behavioral programs, as well as prolonged medical treatment with sibutramine and orlistat without significant effect. He had undergone treatment with Bioenterics Intragastric Balloon® for 6 months and lost 25 kg, but he regained all the weight. His co-morbid conditions included severe hypoventilation of obesity syndrome with chronic CO<sub>2</sub> retention and hypoxemia, severe lower leg edema with chronic venous stasis, fatty liver, mood disorder, and gastroesophageal reflux disease.

In view of the expected extremely high surgical and anesthetic risks of this extensive operation, an algorithm of staged treatment was designed. It was decided to proceed with a minimal possible procedure – laparoscopic sleeve gastrectomy – and after significant weight loss and anticipated improvement of surgical risk to proceed with the second definitive stage. The procedure included a vertical, longitudinal resection of 75% of the stomach by sequential applications of linear staples, thus removing the greater curvature and leaving a neostomach (gastric tube of 100–150 ml in volume). On postoperative day 1, the patient

underwent a contrast swallow X-ray study to rule out leaks, and oral liquids were started. The postoperative period was without complications and his hospital stay was 8 days.

Over the next 6 months the patient gradually lost 45 kg. He experienced a marked attenuation of leg edema, his sleep apnea resolved, and exercise tolerance increased significantly, but the most prominent change was the improvement in his quality of life. At this stage the curve of weight loss flattened. The diagram depicts the weight loss curve over the entire treatment process. His BMI was 59.8, still in the range of super-super-morbid obesity.

The second-stage operation was performed 7½ months after the first one, and laparoscopic biliopancreatic diversion with duodenal switch was completed. The small bowel (ileum) was divided 250 cm proximal to the ileocecal valve, with the proximal loop becoming the biliopancreatic limb and the distal loop becoming the alimentary limb. The first part of the duodenum was also divided, 2 cm distal to the pylorus, and its continuity was established by a hand-sewn anastomosis to the distal end of the divided ileum (alimentary limb), to provide continuity for food passage. The cut end of the divided ileum that became the biliopancreatic limb (proximal end), and the alimentary limb are connected by anastomosis at the 100 cm point from the cecum to form the common channel, where digestion and absorption occur. The postoperative course was uneventful, with a 6 day length of stay.



Schematic presentation of a weight loss curve, kilograms versus month, with timing of the two procedures performed, and photo of the patient prior to surgery.

## Comment

The paradox of surgical treatment for obesity is that the heavier and the sicker the patient, the more extensive the procedure needed for the long-term success of surgery. Series of biliopancreatic diversion with duodenal switch have demonstrated consistent results in terms of magnitude and durability of weight loss. Open BPD-DS enables at least 70–80% excess weight loss and has a well-documented long-term follow-up of 18 years. Clearly the laparoscopic approach is feasible.

Laparoscopic procedures are already common practice in anti-obesity surgery. Compared to open laparoscopic bariatric procedures, BPD-DS is associated with less postoperative pain, lower wound infection rates, shorter lengths of hospital stay, and reduced incidence of late ventral hernia. Despite well-documented benefits of the laparoscopic approach, this technique can be challenging in the super-obese and super-super-obese population (defined as a BMI > 50, and BMI > 60, respectively). Preoperative factors that contribute to technical difficulty in performing laparoscopic bariatric surgery include male gender, android body

habitus, and BMI > 50 kg/m<sup>2</sup> [2]. Men often have an enlarged left liver lobe and android body habitus, whereby the excess body fat concentrates within the peritoneal cavity, increases intraabdominal pressure and thus reduces intraoperative laparoscopic visualization.

In the super-super-obese patient, one-stage bariatric procedures are associated with high perioperative morbidity and mortality rates. This group of patients appears to have less reserve for tolerating surgical complications. The two-stage operative approach was therefore developed for the super-super obese and high risk patients with BMI > 60 kg/m<sup>2</sup>, resulting in reduced perioperative morbidity and mortality [5].

In our patient the optimal surgical treatment would have been a one-stage laparoscopic biliopancreatic diversion with duodenal switch. However, given his body habitus and high surgical risk, it would have been an impossible task to perform in a reasonable operating time. The problem was resolved by dividing the procedure into two parts.

The first-stage procedure (laparoscopic sleeve gastrectomy) is a purely restrictive operation, with a purported anorexigenic effect. Although it is part of the more extensive and complicated biliopancreatic diversion with duodenal switch operation,

as a stand-alone procedure it is relatively simple technically and effective in all weight ranges. It induces weight loss by the decrease in food intake due to the small stomach volume and the decrease in appetite. Alone it is not a satisfactory procedure in either super-obese or the super-super-obese population, therefore another definitive operation is needed. This can be accomplished at a later stage after significant weight loss has occurred and the operative risk has decreased. Conversion to either the standard Roux-en-Y gastric bypass or BPD+DS provides the definitive solution.

BPD-DS is the most extensive and efficacious operation for the treatment of obesity, where the restriction of the small sleeve of stomach is combined with significant malabsorption, achieved by a small intestinal bypass. This operation provides the highest weight loss of all the bariatric procedures and has excellent long-term success rates.

Today, 8 months after the second procedure, the patient is eating regular food, has no diarrhea, and his current weight is 129 kg.

## References

1. Rendon SE, Pories WJ. Quality assurance in bariatric surgery. *Surg Clin North Am* 2005;85:757–71.
2. MacLean LD, Rhode BM, Nohr CW. Late outcomes of isolated gastric bypass. *Ann Surg* 2000;231:524–8.
3. Prachand VN, DaVee RT, Alverdy JC. Duodenal switch provides superior weight loss in the super-obese (BMI > = 50kg/m<sup>2</sup>) compared with gastric bypass. *Ann Surg* 2006;244:611–19.
4. Ren CJ, Patterson E, Gagner M. Early results of laparoscopic biliopancreatic diversion with duodenal switch: a case series of 40 consecutive patients. *Obes Surg* 2000;10:514–23.
5. Regan JP, Inabnet WB, Gagner M, Pomp A. Early experience with two stage laparoscopic Roux-en-Y gastric bypass as an alternative in super-super obese patients. *Obes Surg* 2003;13:861–4.

**Correspondence:** Dr. A. Keidar, Dept. of Surgery, Hadassah Medical Center, P.O. Box 12000, Jerusalem 91120, Israel.  
Phone: (972-2) 677-7384/8800  
Fax: (972-2) 641-9923  
email: andreik@hadassah.org.il