Morbid Obesity – Update 2006

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Definition, Epidemiology and Clinical Course

No new data available.

Diagnostics

No new data available.

Operative Versus Conservative Treatment

Two important studies comparing bariatric surgery versus conservative treatment were published in 2004 [6, 20].

The 10-year results of the prospective controlled Swedish Obese Subjects Study were reported in the by Sjöström et al. [20] (EL 2b). This trial compared 641 patients who were submitted to surgery (156 bandings, 451 vertical banded gastroplasties, VGBs, and 34 gastric bypasses) with 627 obese patients of the control group. At 10 years, the body weight had increased by 1.6% in the control group and had decreased by 16.1% in the surgery group ($p < 0.001$). The surgery group had lower 2- and 10-year incidence rates of diabetes, hypertrygliceridemia and hyperuricemia than the control group, whereas differences between the two groups in the incidence of hypercholesterolemia and hypertension were undetectable.

Christou et al. [6] (EL 2b) reported an observational study using a combination of hospital and provincial insurance administrative databases to assess the effectiveness of bariatric surgery and to compare the mortality, morbidity and healthcare use in morbidly obese patients treated with bariatric surgery with a cohort of matched morbidly obese patients who were not treated surgically. Bariatric surgery resulted in a significant reduction in the mean percentage excess weight loss (EWL) (67.1%, $p < 0.001$). Bariatric surgery patients had significant risk reductions for developing cardiovascular, cancer, endocrine, infectious, psychiatric and mental disorders compared with controls, with the exception of haematologic (no difference) and digestive diseases (increased rates in the bariatric cohort). The mortality rate in the bariatric surgery cohort was

0.68% compared with 6.17% in controls, which translates to a reduction in the relative risk of death by 89%. This is a significant observation because it not only suggest the role of morbidity as a risk factor for early mortality but also provides evidence that surgical treatment of obesity produces a significant reduction in mortality. It is important to note that weight loss in the series by Christou et al. [6] was significantly higher that in the study by Sjöström et al. [20] (67 vs 25%) presumably as a consequence of the higher percentage of Roux-en-Y gastric bypasses (RYGBs) (80 vs 5%). In the Swedish study, 95% of surgical procedures were VBG and adjustable gastric banding; both procedures are associated with less weight loss compared with RYGB.

Therefore, compared with conventional therapy, bariatric surgery results in better long-term weight loss, improved lifestyle, amelioration of risk factors and decreased overall mortality (EL 2b).

Choice of Surgical Approach and Procedure

The laparoscopic approach is considered the gold standard for bariatric procedures and no papers comparing the laparoscopic with the open approach were published between 2004 and 2005.

Two randomized controlled trials (RCTs) comparing laparoscopic RYGB (LRYGB) and laparoscopic VBG (LVBG) [12, 17] (EL 1b) confirmed the results obtained from similar trials in open surgery: LRYGB is a time-consuming, demanding technique with a higher early complication rate compared with LVBG (17.8 vs 2.5%), but LRYGB results in a higher 2-year EWL (71.4 vs 53.1% in the study by Lee et al. [12] and 84.4 vs 59.8% in the study by Olbers et al. [17]).

A further RCT compared LRYGB with the mini-gastric bypass [13] (EL 1b) and showed similar results for resolution of metabolic syndrome, improvement of quality of life (QOL) and EWL at 2 years; nevertheless, the operative morbidity rate was higher for LRYGB (20 vs 7.5%).

VBG and RYGB were also compared in terms of oesophageal function in a prospective nonrandomized series by Ortega et al. [18]: on the basis of manometric and pH-metric results at 3 and 12 months postoperatively, the authors concluded that RYGB is significantly better than VBG as an antireflux procedure (EL 3).

These data were confirmed by Di Francesco et al. [10], who demonstrated that VBG reduced weight but not gastro-oesophageal reflux in obese patient at 1-year follow-up. The authors concluded that VBG should not be proposed for obese patients with reflux symptoms and positive functional tests (EL 3). It is important to note that no comparative data on long-term results of different bariatric procedures are available.

The results of a new bariatric procedure, the Implantable Gastric Stimulator (IGS), a pacemaker-like device that induces satiety, have been presented

in a multicentric prospective series of 69 patients with a mean body mass index (BMI) of 41 [8]. Postoperative morbidity was limited to one case, while the mean EWL was 17% at 6 months and 21% at 10 months. It is not possible to draw any conclusion from this article owing to the reduced number of patients, the limited follow-up and the limited quality of data presented (EL 5). Furthermore, the authors stated that "the exact mechanism of action of electrical stimulation therapy for obesity remains to be defined".

Technical Aspects of Surgery

A review article on the physiologic effects of pneumoperitoneum by Nguyen and Wolfe [14] showed that morbidly obese patients have a higher intra-abdominal pressure of 2–3 times that of nonobese patients. The increased intra-abdominal pressure enhances venous stasis, reduces intraoperative portal venous blood flow, decreases intraoperative urinary output, lowers respiratory compliance, increases airway pressure and impairs cardiac function. Intraoperative management to minimize the adverse changes includes appropriate ventilatory adjustment to avoid hypercapnia and acidosis, the use of sequential compression devices to minimize venous stasis, and optimization of intravascular volume to minimize the effects of increased intra-abdominal pressure on renal and cardiac function.

Laparoscopic adjustable gastric banding is the most frequently applied bariatric technique in Europe and Australia. Different techniques and different bands have been proposed but comparative data are lacking.

O'Brien et al. [16] published a RCT comparing the so-called perigastric with the pars flaccida techniques (EL 1b). Patients operated by the pars flaccida technique had a reduced number of long-term complications (16 vs 42%) and a reduced number of revisional procedures; at 2 years, weight loss, correction of comorbidities and QOL were similar in the two groups.

In a second study, the two more frequently used bands, the LapBand and the Swedish Band, were compared in a RCT by Suter et al. [21] (EL 1b); it is important to note that the LapBand was placed using the perigastric technique, while the Swedish Band was placed using the pars flaccida technique. The two main findings were that early band-related morbidity was higher with the Swedish Band and that weight loss was initially faster with the LapBand. No differences could be found between the two groups regarding late morbidity, late reoperations (10% in each group), and EWL at 2 and 3 years. The two studies present contrasting results concerning the perigastric and the pars flaccida techniques; therefore, existing data are insufficient to define which should be the preferred technique.

The technique of RYGB has not been standardized, a fact which results in a tremendous degree of variation from medical centre to medical centre. It

has been shown that increasing the Roux limb length may improve weight loss after RYGB, especially in patients with preoperative BMI > 50 [3, 4].

A RCT by Inabnet et al. [11] addressed this issue comparing 25 RYGBs with a biliopancreatic limb of 50 cm and an alimentary limb of 100 cm with 23 RYGBs with a biliopancreatic limb of 100 cm and an alimentary limb of 150 cm. The BMI decreased equally in both groups with no differences at 3, 6 and 12 months follow-up (EL 1 b).

Different technical devices have been recently proposed to facilitate or improve laparoscopic bariatric surgery, including robot-assisted procedures [1] and different staple-line reinforcement materials [2, 7, 15]. In a short series, Ali et al. [1] (EL 4) showed the feasibility of robot-assisted LRYGB using the Zeus robotic surgical system and addressed the problem of the learning curve defined as "significant but manageable".

Different materials have been tested in order to reduce staple-line bleeding and/or leaks during LRYGB or laparoscopic sleeve gastrectomy. Angrisani et al. [2] using bovine pericardial strips obtained a reduction of intraoperative leaks (methylene blue test) during LRYGB from 12.5 to 0%, but no differences in terms of bleeding or overall complications were found (EL 1 b). Nguyen et al. [15] obtained a significant reduction in staple-line bleeding sites diagnosed intraoperatively (0.4 vs 2.5) and in mean blood loss (84 vs 129 ml) during LRYGB using a glycolic copolymer sleeve to reinforce the staple line (EL 1 b). Furthermore, a significant reduction in peroperative blood loss was found by Consten et al. [7] comparing ten laparoscopic sleeve gastrectomies using a stapled buttressed absorbable polymer membrane to reinforce staple lines with ten cases using a conventional staple line (EL 2 b).

In conclusion, although on a limited number of patients, the use of some form of reinforcement of the staple line during bariatric surgery seems to be effective in improving intraoperative results, but no differences in postoperative complications have been detected by these studies and no data on costs have been reported.

Peri- and Postoperative Care

De Waele et al. [9], in a series of ten patients with a mean BMI of 38 and a mean age of 36 years, showed that laparoscopic adjustable gastric banding may be performed on an ambulatory basis without readmissions or complications (EL 4). The mean time interval between the end of the operation and discharge was 9.6 h (range 8–13 h). A strict selection of patients was advocated.

Factors influencing the outcome of bariatric surgery were evaluated in two different studies.

Poulose [19] reviewed 54,878 patients undergoing bariatric surgery in the USA in 2001 identified using the 2001 Healthcare Cost and Utilization Project

NIS. Risk factors for increased postoperative mortality included male gender, age above 39 years, Medicaid insured, and need for reoperation.

Very similar results were presented in the study by Carbonell et al. [5], who analysed year 2000 data from the Nationwide Inpatient Database for 5,876 RYGBs: male gender and postoperative complications increased mortality; male gender, increasing age and surgery performed in large hospitals were predictors of morbidity (EL 2b).

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