

BILIOPANCREATIC DIVERSION WITH SLEEVE GASTRECTOMY AND ANTROILEAL ANASTOMOSIS – CASE REPORT

Tomislav Kuliš, Elizabet Glavan, Sandra Škorjanec, Mario Ledinsky and Miroslav Bekavac-Bešlin

University Department of Surgery, Sestre milosrdnice University Hospital, Zagreb, Croatia

SUMMARY – Obesity is becoming a major epidemiological problem throughout the world. Current estimate of obesity in Croatia is 25% of males and 24% of females (BMI ≥ 30 kg/m²). Biliopancreatic diversion combines both restrictive and malabsorptive component of bariatric surgery. It was first described by Scopinaro in 1979 and later modified with sleeve gastrectomy by Marceau in 1993. It is reserved for super obese patients with BMI ≥ 50 kg/m² and is sometimes done in two acts, i.e. sleeve gastrectomy first and then biliopancreatic diversion. A 61-year-old female patient with BMI 52.6 kg/m² and multiple comorbidities is presented. She had previously had many unsuccessful attempts at losing weight with conservative methods. Due to the high BMI and comorbidities, we decided to perform biliopancreatic diversion with sleeve gastrectomy and antroileal anastomosis. On postoperative day 12, the patient was discharged with BMI 49.2 kg/m², yielding a 12% excess weight loss (EWL). After five weeks, she was rehospitalized for suspected pulmonary embolism and was discharged three weeks later. On regular follow up at three months after surgery, the patient had 112 kg, yielding a 35% EWL.

Key words: *Biliopancreatic diversion – methods; Obesity, morbid – surgery; Gastrectomy – methods; Body weight; Weight loss; Case report*

Introduction

Obesity is becoming a major epidemiological problem throughout the world. According to the National Center of Health Statistics, the prevalence of obesity in the USA in 2004 was estimated to 32% percent of US adults aged ≥ 20 , i.e. over 60 million people¹. The WHO estimate of the obesity prevalence in Croatia in 2005 was 25% of males and 24% of females². Obesity is defined as body mass index (BMI) exceeding 30 kg/m² (Table 1), while the indication for operative treatment is BMI ≥ 40 or BMI ≥ 35 with comorbidities^{3,4}.

Case Report

A 61-year-old woman with a life-long history of morbid obesity and current BMI of 52.6 (162 cm height and 138 kg weight) is presented. She was suffering from osteoarthritis, exertional dyspnea and hypertension. She had undergone cholecystectomy in 2000, appendectomy in 1965, and tonsillectomy in 1975. On physical examination, ventral and inguinal hernias were found. She had numerous attempts at losing weight that proved initially successful, however, followed by weight regain or even increase (yo-yo syndrome)⁵.

Prior to surgery, the patient was thoroughly examined by an endocrinologist and a psychologist, our team members. Complete preoperative work-up was done (chest x-ray, electrocardiography, complete blood count, blood clotting tests, blood glucose, and liver and kidney function tests).

Correspondence to: *Tomislav Kuliš, MD*, Svetice 26a, HR-10000 Zagreb, Croatia

E-mail: tkulis@gmail.com

Received December 8, 2006, accepted February 16, 2007

Due to her high BMI, we decided to perform biliopancreatic diversion (BPD) with sleeve gastrectomy⁶.

Operative technique and follow up

The patient was transferred to the operating room and placed on the operating table in supine position. After successful induction of general endotracheal anesthesia, a Foley catheter was placed; abdomen was scrubbed and draped in routine fashion. Access was gained through midline incision. Greater curvature was cleared of all vessels starting at the level across the crow's foot continuing to gastroesophageal junction. Stomach was resected by serial application of linear stapler using nasogastric tube as a stent, thus leaving a gastric tube based on lesser curvature⁷ with preserved vagal innervation and about 80% of the stomach resected. Gastric staple line was oversewn and stomach filled with methylene blue colored saline to ascertain that the cut line was intact and watertight⁷. In its proximal part duodenum was resected with linear stapler. Proximally from ileocecal junction, 75 cm of ileum were measured, to serve to form future common limb. From that point, further 150 cm of ileum were measured. Side to side anastomosis between the points at 75 cm and 225 cm was created and the gut distally from 225 cm was resected, forming alimentary limb. Intestinal segment proximal to this point, anastomosed side to side with the beginning of common limb, was named biliopancreatic limb. Alimentary limb was brought antecolic and anastomosed side to side with the stomach.

In this way, biliopancreatic juice is derived through biliopancreatic limb to join food derived through alimentary limb at the last 75 cm of ileum (Fig. 1). On postoperative day 2, peristalsis was present and nasogastric tube was removed. On postoperative day 5, the patient underwent water soluble contrast (gastrographin) upper gastrointestinal x-ray series, showing no signs of leakage or obstruction (Fig. 2). During the first week, the patient was on liquid diet (water and tea without sugar), for the next 3 weeks only pureed food, and then on normal diet with supplementation of vitamins and minerals. Postoperative recovery proceeded free from complications and the patient was discharged from the hospital on day 12, with BMI of 49.2 (weight 129 kg), already yielding a 12% excess weight loss (EWL). After five weeks, she was rehospitalized for suspected pulmonary embolism and was discharged three weeks later. On regular follow up three months of the surgery, the patient had 112 kg, yielding a 35% EWL.

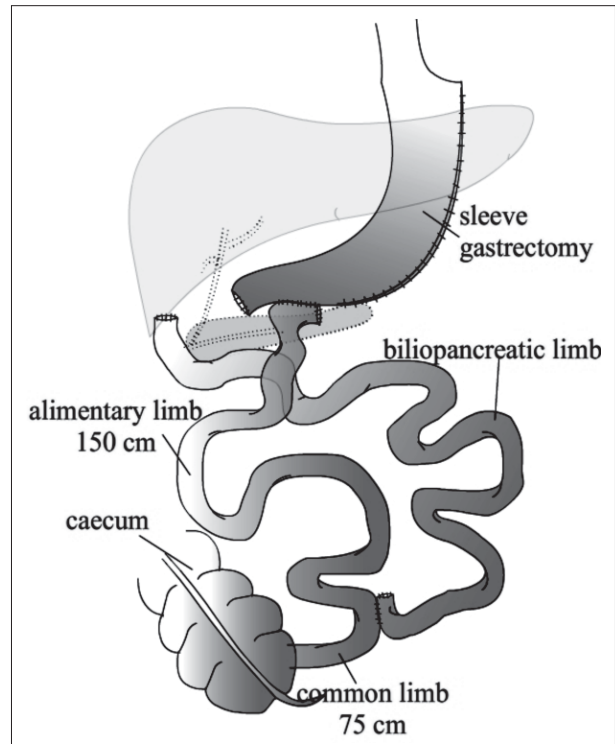


Figure 1. Biliopancreatic diversion with sleeve gastrectomy and antroileal anastomosis.



Figure 2. Gastrographin upper gastrointestinal x-ray.

Discussion

Morbid obesity is associated with numerous comorbidities such as coronary artery disease, cardiac arrest, arterial hypertension, peripheral vascular disease, hyperlipidemia, hypercholesterolemia, diabetes mellitus, pulmonary insufficiency, sleep apnea, osteoarthritis, cholelithiasis, skin infections, chronic venous stasis ulcers, gastroesophageal reflux, sex hormone imbalance with dysmenorrhea, infertility, and stress overflow urinary incontinence^{8,9}. In addition, cancer of endometrium, colon, prostate, and possibly breast have a higher prevalence in obese individuals^{8,9}.

Treatment for obesity can be conservative like dietary therapy, physical activity, behavior therapy, drug therapy, or combined therapy. Weight loss achieved through conservative treatment is frequently hard to maintain, leaving bariatric surgery as a method of choice in morbidly obese patients^{10,11}. It is recommended to approach bariatric surgery with a multidisciplinary team including internal medicine physician, psychologist, psychiatrist interested in eating disorders, dietitian and surgeon.

Bariatric surgery consists of restrictive, malabsorptive and combined procedures. We have experience with laparoscopic adjustable gastric banding (LAGB)¹²⁻¹⁵, which is a restrictive procedure and we present our first case of combined procedure.

Biliopancreatic diversion was first reported by Scopinaro *et al.*^{16,17}. Marceau modified Scopinaro's technique doing sleeve gastrectomy instead of distal gastrectomy¹⁸. We used a combination of Scopinaro's and Marceau's technique doing gastric sleeve resection with antroileal anastomosis. Biliopancreatic diversion is a combined technique consisting of a restrictive component of sleeve gastrectomy and malabsorptive component of biliopancreatic juice diversion. In several studies, biliopancreatic diversion showed good results of 70% to 80% EWL, with maintaining the weight achieved^{19,20}. To date, more than 10,000 biliopancreatic diversions have been reported²¹. Having good results and achieving high %EWL, biliopancreatic diversion has been proposed for patients with higher initial BMI⁶. The method is not free from long-term complications and special care has to be placed on anemia (due to deficient iron absorption)¹⁹, bone demineralization^{19,20} (due to insufficient calcium absorption, mostly absorbed in duodenum and proximal jejunum), and protein malnutrition²², mostly depending on the length of alimentary limb^{23,24}.

Table 1. Classification of adults according to body mass index (BMI)

BMI value	Category
<18.5	Underweight
18.5-25	Normal weight
25.0-30	Overweight
≥ 30	Obese
≥ 35	Severe obesity
≥ 40	Morbid obesity
≥ 50	Super obese

In the case presented, the patient is expected to achieve target BMI of 30 kg/m² in three years²⁵. In the meantime, the patient might require several reconstructive procedures (e.g., abdominoplasty and removal of excess arm skin).

References

1. National Health and Nutrition Examination Survey (NHANES) 2003-2004. Available at: http://www.cdc.gov/nchs/products/pubs/pubBPD/hestats/obese03_04/overwght_adult_03.htm. Accessed July 16, 2006.
2. WHO Global InfoBase Online. Available at: http://w.who.int/ncd_surveillance/infobase/web/InfoBasePolicyMaker/CountryProfiles/QuickCompare.aspx?DM=5&Countries191&Year=2005&sf1=cd.0701&Sex=all&AgeGroup=30-100. Accessed July 16, 2006.
3. American Society for Bariatric Surgery and Society of American Gastrointestinal Endoscopic Surgeons. Guidelines for laparoscopic and open surgical treatment of morbid obesity. *Obes Surg* 2000;10:378-9.
4. American Society for Bariatric Surgery. Guidelines for patient selection and postoperative follow-up care in surgical treatment of obesity. 5-94
5. BROWNELL KD, RODIN J. Medical, metabolic, and psychological effects of weight cycling. *Arch Intern Med* 1994; 154:1325-30.
6. BUCHWALD H. A bariatric surgery algorithm. *Obes Surg* 2002; 12:733-46.
7. RABKIN RA, RABKIN JM, METCALF B, LAZO M, ROSSI M, LEHMANBECKER LB. Laparoscopic technique for performing duodenal switch with gastric reduction. *Obes Surg* 2003;13:263-8.
8. BALSIGER BM, MURR MM, POGGIO JL, SARR MG. Bariatric surgery. Surgery for weight control in patients with morbid obesity. *Med Clin North Am* 2000;84:477-89.
9. MELISSAS J, CRISTODOULAKIS M, SPYRIDAKIS M, *et al.* Disorders associated with clinically severe obesity: significant improvement after surgical weight reduction. *South Med J* 1998;91:1143-8.

10. Council on Scientific Affairs. Treatment of obesity in adults. JAMA 1988;260:2547-51.
11. MARTIN LF, HUNTER S, LAUVE R, O'LEARY JP. Severe obesity: expensive to society, frustrating to treat, but important to confront. South Med J 1995;88:895-902.
12. FRANJIĆ BD, PULJIZ Z, GRGIĆ T, MATEJČIĆ A, BEKAVAC-BEŠLIN M. Laparoscopic surgery in the treatment of morbid obesity: first experiences with the Swedish adjustable gastric band at Sestre milosrdnice University Hospital. Acta Chir Croat 2004;1:9-13. (in Croatian)
13. BEKAVAC-BEŠLIN M. Croatian experience in bariatric surgery. 8th Congress of Endoscopic Surgery of Slovenia, Portorož, May 8-10, 2005.
14. NOVINŠČAK T, DOLOVSKI Z, MATKOVIĆ K, FRANJIĆ BD, GLAVAN E, BEKAVAC-BEŠLIN M. Rani rezultati nove operacijske tehnike u liječenju morbidne pretilosti. 6th Congress of Croatian Society for Digestive Surgery, Opatija, May 18-21, 2005:94.
15. BEKAVAC-BEŠLIN M. Učenje, uvođenje metode, uspjesi i komplikacije *LAP-bandinga*. 2nd Croatian Congress on Obesity with International Participation, Opatija, April 7-9, 2006:33.
16. SCOPINARO N, GIANETTA E, CIVALLERI D, *et al.* Biliopancreatic by-pass for obesity. I An experimental study in dogs. Br J Surg 1979;66:613-7.
17. SCOPINARO N, GIANETTA E, CIVALLERI D, *et al.* Biliopancreatic by-pass for obesity. II Initial experience in man. Br J Surg 1979;66:618-20.
18. MARCEAU P, BIRON S, BOURQUE R-A, *et al.* Biliopancreatic diversion with a new type of gastrectomy. Obes Surg 1993;3:29-35.
19. SCOPINARO N, ADAMI GF, MARINARI GM, *et al.* Biliopancreatic diversion. World J Surg 1998;22:936-46.
20. MARCEAU P, HOULD F-S, SIMARD S, *et al.* Biliopancreatic diversion with duodenal switch. World J Surg 1998;22:947-54.
21. SCOPINARO N, PAPADIA F. Malabsorptive procedures. In: SCHEIN M, WISE L, editors. Controversies in surgery, Vol. 4. New York: Springer, 2001:353-60.
22. VANUYTSEL J, NOBELS F, Van GAAL L, *et al.* A case of malnutrition after biliopancreatic diversion for morbid obesity. Int J Obes 1993;17:425-6.
23. BONALUMI U, CAFIERO F, CAPONETTO A, *et al.* Protein absorption studies in biliopancreatic bypass patients. Int J Obes 1981;5:543.
24. SCOPINARO N, MARINARI GM, GIANETTA E, *et al.* The respective importance of the alimentary limb (AL) and the common limb (CL) in protein absorption (PA) after BPD. Obes Surg 1997;7:168.
25. TOTTE E, HENDRICKX L, Van HEE R. Biliopancreatic diversion for treatment of morbid obesity: experience in 180 consecutive cases. Obes Surg 1999;9:161-5.

Sažetak

BILIOPANKREATIČNO SKRETANJE S GASTREKTOMIJOM U OBLIKU RUKAVA I ANTROILEALNOM ANASTOMOZOM – PRIKAZ SLUČAJA

T. Kuliš, E. Glavan, S. Škorjanec, M. Ledinsky i M. Bekavac-Bešlin

Pretilost postaje jedan od vodećih epidemioloških problema današnjice. Trenutna procjena broja pretilih ljudi u Hrvatskoj je 25% muškaraca i 24% žena (indeks tjelesne mase, BMI ≥ 30 kg/m²). Biliopankreatično skretanje kombinira i restriktivnu i malapsorpcijsku sastavnicu barijatrijske kirurgije. Prvi ga je izveo i opisao Scopinaro 1979. godine, a kasnije ga je Marceau 1993. godine modificirao izvođenjem gastrektomije u obliku rukava. Danas se ova operacija prvenstveno izvodi kod super pretilih bolesnika s BMI ≥ 50 kg/m². Ponekad se izvodi u dva akta: prvo resekcija želuca, a potom biliopankreatično skretanje. Prikazuje se slučaj 61-godišnje bolesnice s BMI od 52.6 kg/m² i više istodobnih bolesti. Bolesnica je prethodno u više navrata neuspješno pokušala smršaviti konzervativnim metodama. Zbog visokog BMI i drugih bolesti odlučili smo se za biliopankreatično skretanje s gastrektomijom u obliku rukava i antroilealnom anastomozom. Dvanaestog poslijeoperacijskog dana bolesnica je otpuštena kući s BMI 49.2%, što je već bio gubitak prekomjerne tjelesne težine (EWL) od 12%. Nakon pet tjedana bolesnica je ponovno hospitalizirana s kliničkim znakovima plućne tromboze te je tri tjedna kasnije otpuštena kući. Na kontrolnom pregledu tri mjeseca nakon operacije bolesnica je imala 112 kg ili EWL 35%.

Ključne riječi: *Biliopankreatično skretanje – metode; Pretilost, morbidna – kirurgija; Gastrektomija – metode; Tjelesna težina; Smanjenje težine; Prikaz slučaja*