Neuroendocrinology Letters Volume 41 No. 2 2020
ISSN: 0172-780X; ISSN-L: 0172-780X; Electronic/Online ISSN: 2354-4716
Web of Knowledge / Web of Science: Neuroendocrinol Lett
Pub Med / Medline: Neuro Endocrinol Lett

CASE REPORT

Surgical treatment of severe dumping syndrome

Marek Smolár[1], Ivana Daňová[1], Juraj Krivuš[2], Lenka Nosáková[3], Hubert Poláček[4], Beata Drobná Sániová[5], Ľudovít Laca[1]

1 Clinic of Surgery and Transplant Center, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic
2 Clinic of Internal Medicine I. Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic
3 Clinic of Gastroenterological Internal Medicine, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic
4 Clinic of Nuclear Medicine, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic
5 Clinic of Anaesthesiology and Intensive medicine, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic

Correspondence to: Nosáková Lenka, MD.
Clinic of Gastroenterological Internal Medicine, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital, Martin, Slovak Republic
e-mail: lenka.bubernakova@gmail.com

Submitted: 2020-05-19 Accepted: 2020-08-12 Published online: 2020-08-12

Key words: **dumping syndrome; gastroptosis; hypoglycaemia; surgical treatment**

Neuroendocrinol Lett 2020; **41**(2):55–59 **PMID:** 33185991 NEL410220C03

Abstract

Dumping syndrome is a common post-operative complication following gastric surgery. Clinically, severe dumping can be a serious medical condition with a negative impact on the patient's life. In our case report, we present a case of refractory dumping syndrome which developed after laparoscopic subtotal gastrectomy with gastrojejunoanastomosis due to massive gastroptosis with stomach evacuation problems. Conservative gastroenterology treatment was not successful. Due to the progression of weight loss and life-threatening hypoglycaemia, the decision for surgical treatment was made. After the corrective gastro-duodenal and jejuno-jejunal anastomoses, all clinical symptoms resolved completely. With regard to the presented case, we discuss the common treatment options for dumping syndrome: the standard recommendations for dietary habits, pharmacological treatment and finally the surgery and its pitfalls. Due to the absence of randomized trials and guidelines, every patient should be treated in a personalized way.

INTRODUCTION

Dumping syndrome (DS) is a particular disorder formed by several symptoms usually occurring after gastric surgery (Mala *et al.* 2015). Gastric surgery has long been known as a cause of DS, however, in recent years, there are more and more reports of DS unrelated to previous gastric surgery (Berg & McCallum 2016). In the past, we have seen this syndrome much more often after surgery for peptic ulcer disease, but with the appearance of PPI, the number of such surgeries has fallen. Nowadays DS is associated usually as a complication of bariatric surgery, gastric by-passes and oesophageal surgery (Van Beek *et al.* 2017). Clinically, it is characterized by various types of postprandial discomfort. We distinguish between early and late dumping syndrome. Early DS includes symptoms of sympathoadrenal activation, like palpitations, tachycardia, fatigue, hypotension, headache and syncope.

Gastrointestinal symptoms, such as abdominal pain, nausea, epigastric fullness, bloating

also belong to the classical clinical view (Van Beek *et al.* 2017; Behrns & Sarr MG 1994). Early DS usually appears within the first 30–60 minutes after a meal. Pathophysiologically, it is caused by the rapid delivery of undigested solid food to the small intestine, where it causes hyperosmolarity. Symptoms can be very serious and debilitating. Conversely, late DS occurs postprandially, 1–3 hours after eating. Symptoms are derived from the development of hyperinsulinism and accompanying hypoglycaemia. Typically, patients feel faint, deconcentrated, weak and confused. In severe cases, a loss of consciousness is also present (Van Beek *et al.* 2017; Behrns & Sarr MG 1994; Berg *et al.* 2013). Some patients suffer from a combination of both. Treatment is complex and difficult, combining dietary habits and in many cases is useful. Pharmacological treatments used are acarbose (Hasegawa *et al.* 1998; Ozgen *et al.* 1998), somatostatin analogues (Fuessl *et al.* 1987; Yan Berge Henegouwen *et al.* 1997), diazoxide, verapamile and many others. If these approaches fail, surgical treatment can be an option in some cases (Leeds *et al.* 1981; Spanakis & Granoli 2009). The type of surgical intervention depends on the specific cause of DS. In this case report, we present the case of a young woman with serious clinical symptoms of DS who underwent successful surgical treatment.

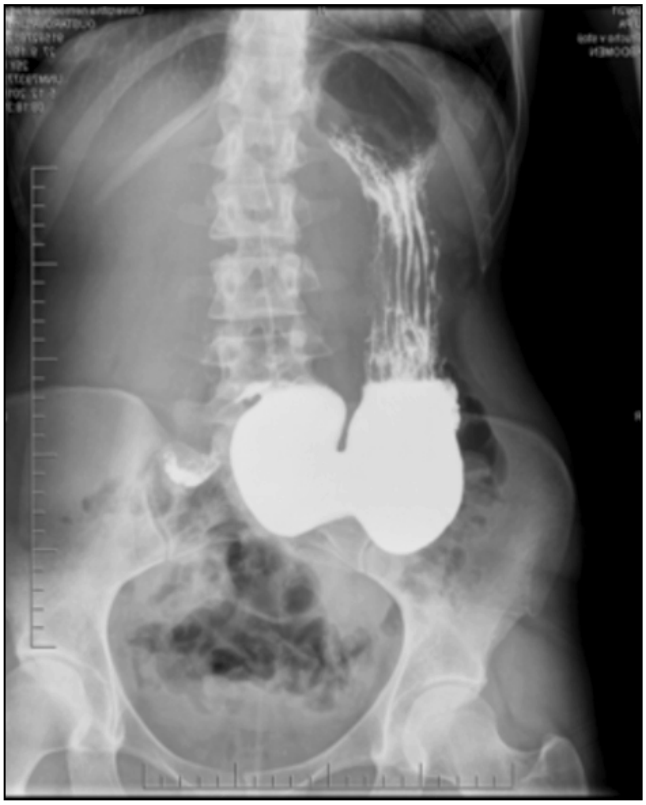

Fig. 1. X-ray passage with a barium contrast - the stomach ptosis extending to the area of the small pelvis

MATERIAL AND METHODS

We present the case of a 27-year-old female patient with combined (early and late) dumping syndrome. She had a personal history of laparoscopic appendectomy in 2016 due to acute appendicitis. She underwent a laparoscopic subtotal gastric resection with Roux-Y gastrojejuno-anastomosis in a local hospital (September 2017) because of ongoing postprandial abdominal fullness and nausea not responding to conservative therapy and regime measures. Before surgery, a gastrofibroscopic examination was carried out. It showed a large stomach with a stagnant food content. The supplemented X-ray passage with a barium contrast agent confirmed the stomach ptosis, with the greater curvature extending into the area of the small pelvis (Figure 1). Her preoperative weight was 55 kg, with a height of 161 cm and a BMI of 21.2 kg/m^2.

Shortly after surgery, the patient started to have problems with the tolerance of oral intake. Difficulties escalated in February 2018 when she experienced nausea, heart palpitations, sweating and pallor shortly after every meal. Weight loss progressed due to the persistence of upper-type dyspeptic syndrome with repeated vomiting. On this occasion, the patient was hospitalized for the first time, at the Clinic of Internal Medicine I., University Hospital. She underwent complex examinations. Gastrofibroscopic examinations showed broadly open gastroenteroanastomosis, with no pathological or morphological findings. The X-ray passage of the upper gastrointestinal tract showed an accelerated gastric emptying. After one hour, the stomach was completely empty (Figure 2). A conservative approach was chosen, with a change in dietary habits as well as vitamin and mineral supplements. During 2018, the patient was hospitalized three more times at Clinic of Internal Medicine – the metabolic department for collapses and episodes of severe hypoglycaemia. As part of a differential diagnosis, examinations for excluding hormone-active neuroendocrine tumour and endocrine diseases were performed. In the 72-hour fasting test, the lowest blood glucose level was 3.0mmol/L. The oral glucose tolerance confirmed the diagnosis of DS with induced significant hypoglycaemia in the second hour after glucose ingestion. The measured blood glucose value after two hours was 2.6mmol/L. Tumour markers of neuroendocrine neoplasia (chromogranin A, NSE, urine for 5-HIAA) were all negative. The PET/CT examination did not show any pathological glucose metabolism or other signs of malignancy. Clinical symptoms and Sigstad's diagnostic index (patient acquired 15 points – Table 1) favoured the diagnosis of combined dumping syndrome. The diagnosis was also verified by gastric emptying scintigraphy using labelled solid egg white (mixed with 30 MBq of 99m Tc-MAA before cooking). The half-life of the gastric evacuation was not measurable – more than two thirds of the administered activity had already passed into the small intestine in the earliest (0 min.) acquisition. The small intestine transit time was estimated at ~120 minutes. After 270 minutes,

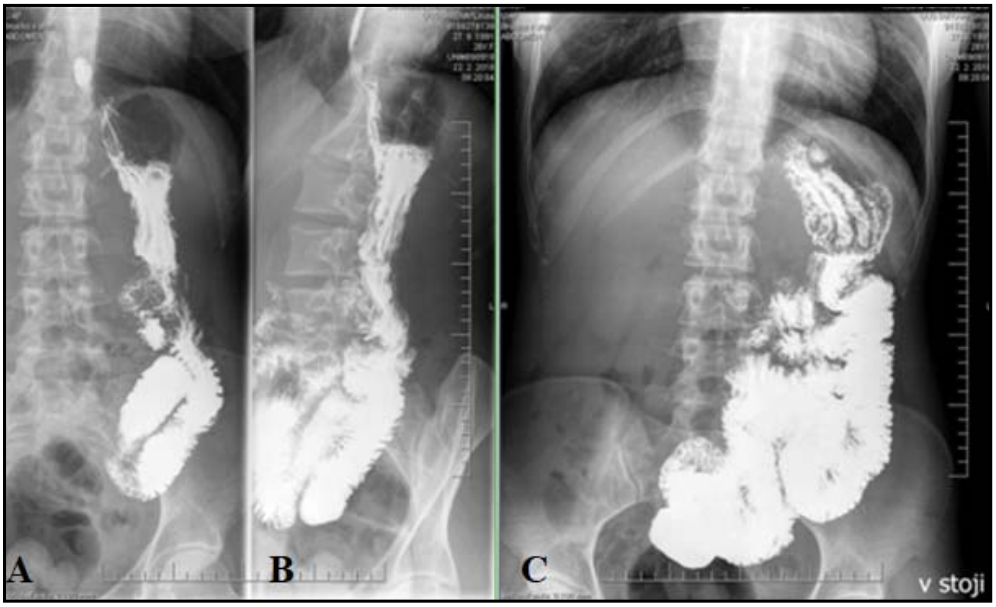

Fig. 2. X-ray passage of the upper gastrointestinal tract showed an accelerated gastric emptying (A in 0. minute, B in 30. minute, C in 60. minute)

the radiopharmaceutical reached the sigmoid colon (Figure 3).

The patient was evaluated by a multidisciplinary board with an internist, gastroenterologist, surgeon and nuclear doctor. The patient refused pharmacological treatment with octreotide. Due to the failure of conservative treatment and the severity of symptoms with progressive weight loss (44 kg, BMI 17kg/m^2), the patient was indicated for surgical treatment.

The patient was examined and prepared by an anaesthesiologist, general anaesthesia was planned.

RESULTS

The classical upper laparotomy approach was chosen. In the first phase, the Roux-Y anastomosis was disconnected. The oral portion of the stomach stump was long enough to construct gastro-duodenal anastomosis

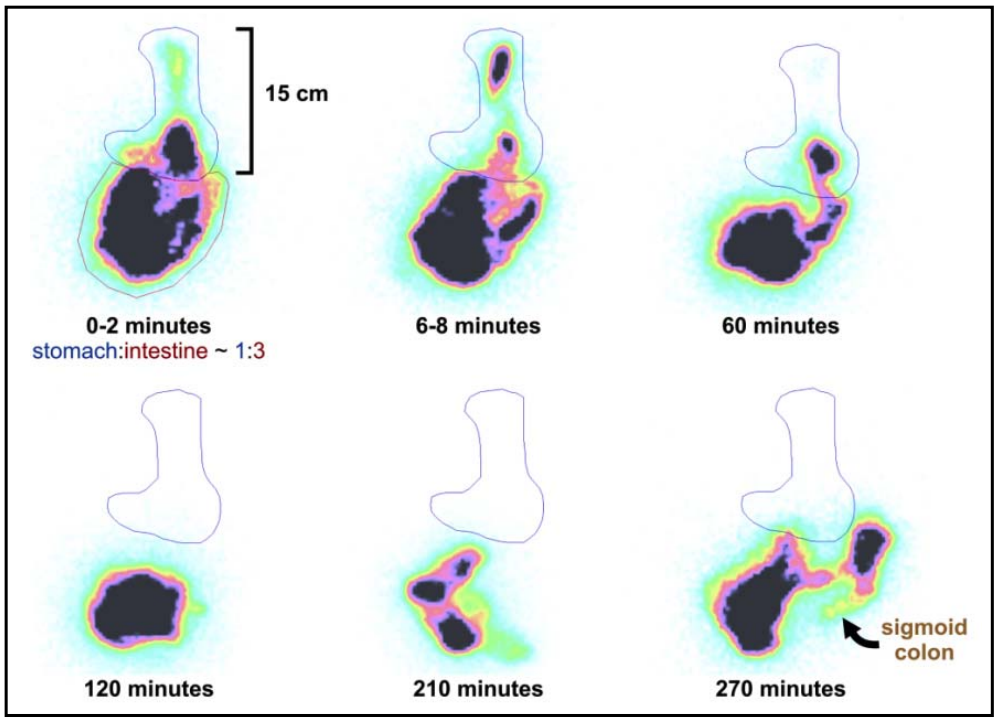

Fig. 3. Gastric emptying study with labelled solid egg white. Acquisition had been performed in upright position, geometric means of anterior and posterior 2 minute views are shown.

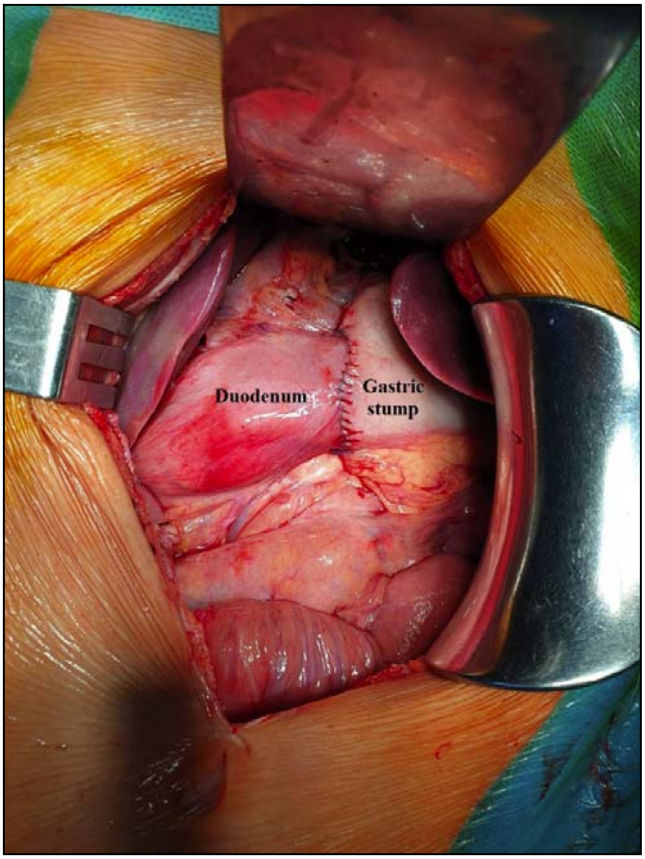

Fig. 4. Conversion of Billroth II to Billroth I by construction of gastroduodenal anastomosis

according to the Bilroth I method (Figure 4). Tension-free anastomosis was also achieved by the partial mobilization of the duodenum using Kocher's manoeuver. The small intestine was reconstructed with jejuno-jejuno anastomosis. Surgery was performed in a standard way, without perioperative complications. The course of general anaesthesia was without complications. From the second postoperative day, the patient received fluids, on the fourth day a soft food diet and on the fifth day she was discharged with a tolerated oral intake of solid food. Since the operation, the patient has been free of any symptoms of dumping syndrome. During the follow-up month, the patient thrived, had no digestive problems, and gained 6 kg.

DISCUSSION

In our case report, we described the management and treatment of serious dumping syndrome (DS). It was observed that approximately 20% of patients who undergo gastric surgery will develop DS (Hui *et al.* 2020). However, there is a lack of randomized studies to report its prevalence. Severe symptoms are present in 1–5% of cases. The evaluation of serious clinical symptoms is usually made by using a questionnaire and scores (Ukleja 2005). The most and widely used is probably the Sigstad score (Table 1), which had limitations in use for late dumping syndrome. The latest and probably more useful questionnaire is the Dumping severity score questionnaire, but validated cut-off levels are also not available. In general, the treatment and management of dumping syndrome depends on the type (early vs late), and combine dietary habits, medications and in special cases, surgery. First of all, dietary modifications are recommended. Patients should reduce or eliminate their intake of carbohydrates, eat smaller portions, avoid drinking fluids when eating, increase their intake of dietary fiber and avoid drinking alcohol (Emous *et al.* 2017). If the change in dietary patterns fails, the next step is medication. There are a number of pharmacological options in the treatment of DS. α-glucoside inhibitor acarbose is one of the oldest medications used in this indication (Speth *et al.* 1983). Diazoxide is a potassium channel activator which inhibits the secretion of insulin (Berg & McCallum 2016). The use of octreotide has improved the quality of life in patients with DS. It relieves symptoms in the short-term, but also in the long-term treatment of severe dumping syndrome. Clinical improvement is seen in more than 90% of cases, and limitations are usually because of side effects (Speth *et al.* 1983). Surgical treatment is reserved for individual cases. Conservative treatment is usually effective and preferred, because the symptoms of DS can disappear in time and surgery may not be curative. But in some serious cases, surgery is the best option. There are several surgical procedures which have been proposed and tested, such as pyloric reconstruction, jejunal interposition (Henley-Soupault operation), conversion of Billroth II to Biltorth I anastomosis, Roux- en Y conversion and other experimental procedures (Speth *et al.* 1983; De Mello *et al.* 1976). Unfortunately, there are no controlled trials to compare the effectiveness and long-term results of different types of surgical procedures. Surgical treatment should be highly specific and the choice of intervention should be individual and based on the centre's experience.

In our case, surgical treatment was indicated after the failure of conservative treatment, and also because of the gravity of the clinical symptoms, repeated severe collapses due to hypoglycaemia followed by the re-hospitalization of the young patient. The conversion of Billroth II to Bilroth I seemed to be the best choice in this case. After surgery, clinical symptoms and weight were closely monitored. The duration of the follow-up of patients is unclear, and should be subject to further investigation.

CONCLUSION

Dumping syndrome is a common post-operative complication following gastric surgery. Clinically, severe dumping can be a serious medical condition and can have negative impact on the patient´s life. The diagnosis of dumping syndrome should be considered in every patient with anamnesis of gastric surgery, and is

Tab. 1. Sigstad score, presented symptoms in our patient in the right (source: Nat Rev Gastroenterol Hepatol ©2009 Nature publising Group). A score of greater than 7 is suggestive of DS, score of less than 4 suggest another disease.

Sigstad score	Presence of symptoms in our patient
Shock +5	
Fainting, syncope, unconsciousness +4	+ 4
Desire to lie or sit down +4	+ 4
Breathlessness, dyspnea +3	
Weakness, exhaustion +3	+ 3
Sleepiness, drowsiness, apathy, falling asllep +3	
Palpitation +3	+ 3
Restlessness +2	
Dizziness +2	+ 2
Headaches +1	
Feeling of warmth, sweating, pallor, clammy skin +1	+ 1
Nausea +1	+ 1
Abdominal fullness, meteorism +1	+ 1
Borborygmus +1	
Eructation -1	
Vomiting -4	-4
Total:	15 (19-4)

based on clinical presentation. The majority of patients respond to medical therapy, mainly dietary modifications. Therapy with octreotide is an effective alternative before considering surgical correction, but patients can be affected by unpleasant side effects. If medical and dietary therapy fails, and serious symptoms persist, surgical revision should be considered and indicated after a multidisciplinary evaluation by a team of specialists. The type of surgical procedure should be highly specific and individual.

REFERENCES

1 Behrns KE, Sarr MG (1994). The early postprandial dumping syndrome: prevention and treatment. Adv Surg. **27**: 233–255.
2 Berg P, Hall M, Sarosiek I, McCallum RW (2013). Understanding the etiologies, clinical spectrum, and diagnostic challenge of dumping syndrome. Gastroenterology. **144**(5): (Supp 1.) S- 734.
3 Berg P, McCallum R. (2016). Dumping Syndrome: A Review of the Current Concepts of Pathophysiology, Diagnosis, and Treatment. Dig Dis Sci. **61**(1): 11–18.
4 De Mello JB, Garrido A Jr, Moreira A, Matsuda M, Raia AA (1976). Henley-Soupault technic of gastric transit reconstruction in the treatment of postgastrectomy syndromes. AMB Rev Assoc Med Bras. **22**(6): 210–217.
5 Emous M, Wolffenbuttel BHR, Totté E, van Beek AP (2017). The short- to mid-term symptom prevalence of dumping syndrome after primary gastric-bypass surgery and its impact on health-related quality of life. Surgery for Obesity and Related Diseases, **13**(9): 1489–1500.
6 Fuessl HS, Carolan G, Williams G, Bloom SR (1987). Effect of a longacting somatostatin analogue (SMS 201-995) on postprandial gastric emptying of 99mTc-tin colloid and mouth-to-caecum transit time in man. Digestion. **36**: 101–107.
7 Hasegawa T, Yoneda M, Nakamura K, Ohnishi K, Harada H, Kyouda T, Yoshida Y, Makino I (1998). Long-term effect of alpha-glucosidase inhibitor on late dumping syndrome. J Gastroenterol Hepatol. **13**: 1201–1206.
8 Hui C, Waheed A, Bauza GJ (2020). Dumping syndrome. In: StatPearls [Internet]. Treasure Island (FL): StatPearls PublishinG Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470542/
9 Leeds AR, Ralphs DN, Ebied F,Metz G, Dilawari JB (1981). Pectin in the dumping syndrome: reduction of symptoms and plasma volume changes. Lancet. **1**: 1075–1078.
10 Mala T, Hewitt S, Høgestøl IK, Kjelleyold K, Kristinsson JA, Risstad H (2015). Dumping syndrome following gastric surgery. Tidsskr Nor Laegeforen. **27;135**(2): 137–141.
11 Ozgen AG, Hamulu F, Bayraktar F, Cetínkalp S, Yilmaz C, Túzún M, Kabalak T (1998). Long-term treatment with acarbose for the treatment of reactive hypoglycemia. Eat Weight Disord. **3**: 136–140.
12 Spanakis E, Gragnoli C (2009). Successful medical management of status post-Roux-en-Y-gastric-bypass hyperinsulinemic hypoglycemia. Obes Surg. **19**: 1333–1334.
13 Speth PA, Jansen JB, Lamers CB (1983). Effect of acarbose, pectin, a combination of acarbose with pectin, and placebo on postprandial reactive hypoglycaemia after gastric surgery. Gut. **24**(9): 798–802.
14 Van Beek AP, Emous M, Laville M, Tack J (2017). Dumping syndrome after esophageal, gastric or bariatric surgery: pathophysiology, diagnosis, and management. Obes Rev. **18**(1): 68–85.
15 Ukleja, A (2005). Dumping Syndrome: Pathophysiology and Treatment. Nutrition in Clinical Practice, **20**(5): 517–525.
16 Yan Berge Henegouwen MI, van Gulik TM, Akkermans LM, Jansen JB, Gouma DJ (1997). The effect of octreotide on gastric emptying at a dosage used to prevent complications after pancreatic surgery: a randomised, placebo controlled study in volunteers. Gut. **41**(6): 758–762.