

A Leak Post One Anastomosis Gastric Bypass Following Misoprostol Treatment

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Despite recent advances in the pharmacological and endoscopic treatments for obesity, bariatric surgery is still considered one of the most effective and safe treatments for morbid obesity with over 250,000 bariatric procedures performed each year in the United States. While these procedures are considered safe, they are not free of complications. It has been reported that the primary short-term major complication after Roux-en-Y gastric bypass (RYGB), one-anastomosis (Mini) gastric bypass (OAGB), or sleeve gastrectomy (SG) is gastrointestinal leakage, with a reported leak rate of 0.1–8.3%, 0–5.1%, and 0–7%, respectively [1,2]. While the etiology of gastrointestinal leakage following bariatric procedure is multifactorial, including preoperative, intraoperative, and postoperative factors, a single factor can rarely be attributed to this unfortunate complication. We describe a case of a 30-year-old woman who presented on postoperative day (POD) 10 of a OAGB with a gastrointestinal leakage after treated with a high dose of oral misoprostol.

PATIENT DESCRIPTION

A 30-year-old woman underwent a laparoscopic OAGB in October

2019 at our academic institution due to morbid obesity. She had an initial body mass index (BMI) of 40 kg/m² (body weight 110 kg and height 165 cm). Despite the morbid obesity, she was generally healthy without other co-morbidities. Her past surgical and medical history included a cervical conization due to a cervical intraepithelial neoplasia grade 3 that was performed in May 2019, 5 months prior to her bariatric surgery.

Her preoperative evaluation, intraoperative course, and immediate postoperative course were all uneventful. In addition, a routine upper gastrointestinal X-ray series on POD1 was normal. The patient was discharged on POD3 as per protocol at our institute.

On POD8 the patient presented to the emergency department with symptoms of lower abdominal pain not associated with other gastrointestinal symptoms or fever. Her vital signs on arrival were all within the normal range. On physical examination she had lower abdominal tenderness without rigidity or diffuse signs of peritoneal irritation. Her laboratory workup did not reveal any abnormalities, except for a mildly elevated blood cell count of $12 \times 10^9/L$ (reference range 3.79–10.33) with no left shift. A computed tomography (CT) scan revealed a fluid-filled endometrial cavity and endocervical canal with endometrial mucosal enhancement without any other pathological findings. A transvaginal pelvic

ultrasound confirmed the suspected diagnosis of hematometra and hematoocolpos, secondary to cervical canal stenosis. The patient stated that her last menstrual period was 5 months prior to her current admission, denying any menstrual bleeding since her conization. A cervical dilation using a Hegar dilator was preformed, and immediately after there was a small amount of bloody vaginal discharge. The patient was treated medically with 800 mcg misoprostol administered buccally and was discharged home with a follow-up obstetrics and gynecology appointment scheduled for the following week. The same day the patient had a strong menstrual bleed and her symptoms resolved.

On POD10 the patient arrived at the emergency department with acute severe symptoms of left upper quadrant abdominal pain. On arrival she was febrile (with a temperature of 37.8°C), tachycardic (130 beats per minute), and normal blood pressure. Her abdomen was not tender, and her blood work showed a significant leukocytosis (white blood cell count of $28 \times 10^9/L$) with an elevated C-reactive protein (CRP) of 14 mg/dl (reference range 0–0.5). A CT scan with oral and intravenous contrast was conducted, demonstrating extraluminal gas bubbles just adjacent to the single anastomosis. A treatment regime that included intravenous broad-spectrum antibiotics, antimycotics, and fluids was immediately started, and the patient

was transferred to the operating room for a laparoscopic exploration. Intraoperatively the abdominal cavity was free of fluid or any purulent exudate. The Omentum was tightly adherent to the anastomosis site and to the gastric staple line. After a careful separation, the single anastomosis appeared intact, but there was a small purulent collection noted adjacent to the superior end of the gastric staple line. Although the intraoperative methylene blue dye test was negative, a reinforcement continuous running suture was placed along the gastric staple line and a drain was inserted around the suspected perforation site.

The following evening of POD1, an off-color fluid appeared in the surgical drain, and an upper gastrointestinal X-ray series showed a leak in the esophagogastric junction (EGJ) region of the gastric staple line. Although the patient was clinically stable, afebrile, and without any signs of a septic state, a joint decision of the bariatric team and the patient was made to return to the operating room for revisional surgery. On POD2 laparoscopic surgery was performed. Again the omentum was tightly adherent to the gastric staple line and there was a small purulent collection noted adjacent to the gastric staple at the EGJ end. The remaining gastric pouch was resected and a reconstruction with a Roux-en-Y esophagojejunostomy was performed.

COMMENT

The etiology of leaks following gastrointestinal surgeries is multifactorial.

The main factors affecting this complication can be broadly divided into two causes: technical and mechanical factors or inadequate perfusion factors.

Misoprostol is a synthetic E1 prostaglandin (PGE1) analog that is widely used in obstetric and gynecological practice due to its uterotonic and cervical softening and dilation effects. PGE1 may have a key role in the gastrointestinal tract in modulating mucosal integrity and was originally developed for the prevention and treatment of gastric ulcers. However, its full mechanism of action and the variety of potential effects are not known. PEG1 analogs may also be a factor in modulation of the systemic immune response as well as local intestinal inflammatory response. It has a relaxation and contraction effect on smooth muscle and has a vasodilation and vasoconstriction effects on blood vessels. The different effects contribute to the specific E prostanoïd receptor subtypes activated by PGE1, with vasoconstriction mediated by the EP1 and EP3 receptors and vasodilation caused by the EP2 and EP4 receptors [3].

The clinical implications of these effects are not clear, although a few case reports have described substantial adverse vascular effects of misoprostol, including coronary artery vasospasm resulting in an acute myocardial infarction following misoprostol treatment [4]. In addition to the possible ischemic effects of misoprostol, it is well described that this drug can cause diarrhea and abdominal pain, especially in high doses of 800 mcg [5]. These symptoms indi-

cate an increased intestinal motility and smooth muscle activity that in turn can lead to mechanical sheer pressure and increased intragastric pressures, factors that may contribute to leaks post bariatric surgeries.

CONCLUSIONS

The chronological sequence in our case suggests that the misoprostol treatment may have played a role in this patient's unfortunate complication and should warrant further research.

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A prince who is not wise himself will never take good advice.

Niccolo Machiavelli 1469-1527, political philosopher and author