The study presented a case of a gastrocutaneous fistula, as a result of bariatric sleeve gastrectomy. The discussion considered the main pathogenesis, etiology, diagnostics and endoscopic treatment using the implantation of covered esophageal stents. Special attention was placed upon the multifactorial origin of this life-threatening clinical condition, typical for bariatric surgery.

**Key words:** gastrocutaneous fistula, bariatric surgery, sleeve gastrectomy, covered esophageal stent, endoscopic treatment

Surgical treatment of obesity for many years has become increasingly popular in connection with obtaining the desired effects of long-term weight loss in obese patients. Weight reduction of 5-10% in relationship to the initial weight is associated with decreased cardiovascular risk, considering the obese patient (1, 2, 3). Currently, the most common type of bariatric surgery performed in Poland (2011– 516 procedures), responsible for the transient therapeutic effect by means of stomach volume reduction is sleeve gastrectomy (SG) (1, 4).

The widely considered safety of the method (mortality-0.19%) does not exempt the physician from the obligation to prevent and manage potential life-threatening complications, such as gastrocutaneous fistulas (GCF) (1, 5). The above-mentioned complication is typical of gastric operations, and a characteristic consequence of bariatric surgery, its incidence ranging between 0.9 and 5.3%. Mortality in case of therapeutic failure amounts to 9%, thus, GCF is a challenging clinical problem (5, 6).

**CASE REPORT**

A 48-year old female patient was admitted to the department with suspicion of an acute abdomen. The patient complained of severe epigastric and left subcostal pain with concomitant nausea and fever. The physical examination revealed the presence of a palpable epigastric tumor. Laboratory results showed increased inflammatory parameters, microcytic anemia, and hypalbuminemia. Three months prior to the hospitalization the patient underwent sleeve gastrectomy (BMI 37 kg/m²). Ever since, complains of lack of appetite, fatigue, and transient nausea. The patient was diagnosed with anemia requiring blood transfusions with an unsatisfactory result. Additionally, the patient has arterial hypertension and rheumatoid arthritis requiring treatment...
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by means of biological drugs and frequent steroid pulses.

Based on the medical history and presented symptoms abdominal CT was performed, which demonstrated an irregular inflammatory infiltration located between the right hepatic lobe and gastric tube, infiltrating the transverse colon at a length of 7 cm, arousing suspicion of an abdominal abscess. Emergency laparotomy revealed the presence of a 12 cm long, omental inflammatory conglomerate and subhepatic abscess. The gastric tube after sleeve gastrectomy was completely changed by inflammation, which additionally hindered the intraoperative evaluation. Perforation and leakage were excluded. The histopathological examination of the excised tumor showed the presence of an unspecific inflammatory process.

The patient was discharged from the hospital in good general condition seven days after surgery.

The patient was once again admitted to the hospital 10 days after surgery with symptoms of leakage of a brownish content mixed with nutritional remains from the partly healed laparotomic wound, being accompanied by local skin irritation. Additional examinations showed increased inflammatory parameters, left pleural cavity effusion, and both-sided pneumonia. Endoscopy of the upper gastrointestinal tract was performed, which showed the presence of an internal ostium of the gastrocutaneous fistula, located in the vicinity of His's angle, from the greater curvature, oval in shape, 1 cm in diameter. Initial treatment consisted in conservative therapy comprising parenteral nutrition, GOPP decompression by means of a probe, which additionally enabled enteral nutrition, distally from the fistula. After one week, a self-expanding covered stent WallFlex™ Boston Scientific) was inserted by means of endoscopy, obtaining an immediate effect of fistula closure (fig. 1, 2, 3, 4).

Additional measures included the use of an external suction drain, initiation of enteral nutrition, water-electrolyte supplementation, targeted antibiotics, as well as the administration of somatostatin and PPI, which created favorable conditions for fistula healing. The external ostium was subject to spontaneous closure after five days. The covered stent was removed during control endoscopy after 6 weeks.

DISCUSSION

The gastrocutaneous fistula (GCF) is composed of an internal ostium, tissue canal, and external orifice. The above-mentioned condition is secondary to gastric surgery (75-85% of all gastrointestinal fistulas are postoperative GCFs), especially in case of direct or indirect iatrogenic damage of the ischemic area (6, 7, 8). This is most frequently observed in consequence of the resection of the proximal part of the major curvature and His's angle. This is associated with poor vascularization and a thinner gastric wall, being location to gastric content leakage (89% of cases) (1, 2, 4, 5). GCF occurs more often after bariatric surgery of the

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Fig. 1. Flororoscopy: the self-expanded esophageal stent WallFlex™ was successfully inserted (arrow)

Fig. 2. CT scan of the abdomen (plane horizontal) revealed the expanded esophageal stent WallFlex™ (arrow)
stomach, complicating 5.1% of the procedures in obese patients, and the observed mortality during the course of GCF is higher, as compared to patients with a normal BMI (35% vs. 85% during sepsis).

Sleeve gastrectomy (SG) might trigger the development of GCF (5). This is probably associated with the long, vertical line of staples, along the gastric tube. Improper selection of the size of the staples and suture line, are also responsible for possible leakage. Other coexisting causes include acute or chronic inflammation, abscess in the left upper abdominal quadrant or epigastrium, gastric irritation by a foreign body (drains), splenectomy, as well as complications after long-lasting gastrostomy (6, 9). At this point one should pay special attention to the multifactorial character of the described complication, in which concomitant diseases play a significant role, often present in obese patients, which negatively influence the general anastomotic healing process and might lead to the development of gastric wall necrosis (3, 7). The physician is obliged to diligently search for the above-mentioned in any patient scheduled for bariatric surgery.

The presented study case is an example of the coexistence of the mentioned factors. An obese patient after two operations burdened with risk of fistula development (sleeve gastrectomy and emergency laparotomy, due to inflammation and epigastric abscess), additionally complaining of lack of appetite for several months (microelement insufficiency typical of obese patients), arterial hypertension, moderate anemia, and steroid therapy during the course of rheumatoid arthritis (increased atherosclerosis limiting organ vascularization and impairing healing). Analysis of the above-mentioned factors classified the patient as high-risk, considering gastrocutaneous fistula development.

The most common clinical symptoms of GCF include gastric content leakage through the external ostium with irritation of surrounding skin, nausea, vomiting, infiltration of the lower pulmonary lungs, and pleural effusion. The most sensitive symptom is intractable tachycardia (>100/min) of unknown cause, fever, and left upper quadrant abdominal pain radiating to the left scapula (1, 4, 5, 9). In case of each patient after bariatric surgery of the stomach presenting with the above-mentioned symptoms, X-ray contrast enema and abdominal CT should be performed (4, 5, 9). One should not forget that CT does not exclude the above-mentioned condition, and can only confirm its presence (1).

Basic management depends on the patients’ condition. In cases when the patient is hemodynamically stable and presents mild symptoms, conservative therapy is the treatment of choice, while open surgery should be reserved in life-threatening conditions or in case of failure, considering current therapy (4, 5). Initial management comprises the following: gastrointestinal decompression by means of a
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probe, which allows fluid parenteral nutrition, distally to the fistula, external active drainage, water-electrolyte supplementation, and antibiotics therapy (2, 6, 7, 9). The most significant factor considering conservative treatment consists in the combination of total parenteral nutrition, somatostatin or its analogue-octreotide, and PPIs. A recognized adjuvant method consists in numerous endoscopic procedures with the use of tissue glues, OTSC clip systems, SurgSIS, and most frequently used self-expanding esophageal stents (partially or completely covered) (1, 5, 9, 10). The implantation of a covered stent into the gastric tube leads to immediate closure of the internal ostium, is an additional barrier protecting against inflammation, and allows the implementation of early oral nutrition.

It is worth mentioning that early oral nutrition does not interfere with the healing process, being well tolerated, and may be safely used. The use of covered stents in the management of GCF after sleeve gastrectomy is characterized by high efficacy amounting to 83-88%. However, it is essential that the introduction of the stent be no later than 21 days since fistula development (1, 4, 11). The disadvantage of the above-mentioned is associated with the frequent migration of the stent (ranging between 17% and 58%), which leads to fistula exposure, pain, intensification of GERD symptoms, and thus, in selected cases the need for emergency removal of the stent. Most often (90% of cases) it is possible to remove the stent endoscopically, which should take place 6 weeks after implantation (1). Optimal treatment enables spontaneous gastrocutaneous fistula closure within 5-8 weeks in 60-70% of cases (1, 5, 7).

CONCLUSION

The gastrocutaneous fistula is a characteristic complication of bariatric operations, such as sleeve gastrectomy. Improper treatment may result in severe consequences, including patient death. Optimal combination of conservative treatment and endoscopic covered stent implantation allows for effective and safe recovery of most patients. Time and outcome of the presented study case is satisfactory and corresponds to the effects obtained in other leading medical centers.

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