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Case Report

Stepwise management of locally advanced gastric cancer, complicated by recurrent hemorrhage, in the conditions of multi-specialty hospital

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Abstract

One of the most widespread oncological diseases (second place after lung cancers) is gastric cancer, which remains one of the leading causes of cancer-related deaths, even though its incidence is decreasing and there are newly available treatment options. Bleeding is a relatively common phenomenon in patients with solid neoplasms, occurring in up to 10% of all patients in advanced stages of cancer. Management of bleeding in the case of advanced stages of gastric cancer remains a complicated surgical problem. This article describes a case of stepwise treatment of a patient with locally advanced gastric cancer, complicated by relapsing hemorrhage in the setting of a multi-specialty hospital, highlighting the importance of multidisciplinary teamwork.

Keywords: embolization, gastrectomy, gastric cancer, hemorrhage

Introduction

One of the most widespread oncological diseases (second place after lung cancers) is gastric cancer [1-4]. Nowadays, the incidence of this disease tends to decrease. Nevertheless, gastric cancer remains one of the leading causes of cancer-related deaths, even though its incidence is decreasing and there are newly available treatment options [5]. More than 500.000 patients die every year due to gastric cancer [6]. In such patients, the 5-year survival rates often do not exceed 25% and remain poor due to relapse [7-9].

Bleeding is a relatively common phenomenon in patients with solid neoplasms, occurring in up to 10% of all patients in advanced stages of cancer [10]. Nowadays, the surgical treatment of locally advanced gastric cancer of stages III-IV is a particularly important problem and the frequency of this stage among all the newly revealed cases of this nosological entity is changing from 20 to 60% according to different authors [3,4,11]. The selection of a clinical strategy for the treatment of locally advanced gastric cancer, complicated by hemorrhage depends on many factors, including the severity of patient's condition, the extent of blood loss, availability of up-to-date medical equipment

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and qualified medical staff in the hospital (12).

We, therefore, present a case of stepwise management of a patient with locally advanced gastric cancer T4NxM0, III stage complicated with the hemorrhage who was treated using endovascular techniques.

Case

A 71-year-old patient with long-term gastric ulcer was urgently operated for perforated peptic ulcer in December 2016. The patient underwent laparotomy and suturing of the gastric perforation. During that time the biopsy was not performed. In April 2017 the patient was urgently admitted to the municipal clinical hospital of S. P. Botkin with the clinical symptoms of gastric hemorrhage, which presented itself with menorrhagia and hypotension (blood pressure of 90/60 mmHg). When the patient was admitted to the hospital the level of his hemoglobin was 72 g/dL and erythrocytes were $2,9 \times 10^{12}/L$. Considering the severity of the patient's condition, he was hospitalized in the intensive care department, where esophagogastroduodenoscopy (EGDS) was performed. The conclusion of the examination was antral gastric cancer with signs of prolonged bleeding and stricture formation. We performed a non-contact method of endoscopic hemostasis with the use of argon plasma coagulation. The result of the morphological examination was moderately differentiated gastric adenocarcinoma with signs of disintegration of the tumor.

After the procedure, the patient did not present with signs of bleeding and was managed conservatively. A computer tomography (CT) scan was performed to determine the extent of the oncological process. The thickening of the gastric walls in the gastric antrum throughout 4 cm and lymphadenopathy of the abdominal cavity with the possible regional metastasis in the area of lymph nodes of the 3, 4 and 5 groups were diagnosed during the CT with intravenous contrast of the abdominal and thoracic cavity organs. There were no signs of distant metastasis. EGDS demonstrated gastric wall abnormality till the serous membrane and the lymph-node hyperplasia in the area of the 3, 4 and 5 groups. The data of the examination determined the following diagnosis: moderately differentiated adenocarcinoma of the gastric antrum T4NxM0. ECOG 2. Complications of the disease: gastric bleeding, posthemorrhagic anemia of medium severity, subcompensated pyloric stenosis.

Despite the hemostatic treatment, the recurrent hemorrhage developed on the 12th day after admission. The recurrent hemorrhage presented itself as vomiting with blood, hypotension (90/60 mmHg) and decreased hemoglobin level (57 g/dL). The patient was transferred to the emergency department. The signs of the recently occurred recurrent hemorrhage were not revealed during the EGDS procedure. Taking into consideration the severity of the patient's condition, inefficiency of the conservative treatment and the data of recurrent gastric hemorrhage, confirmed during the EGDS, it was decided to perform angiography with possible mechanical embolization of the «causative» vessel.

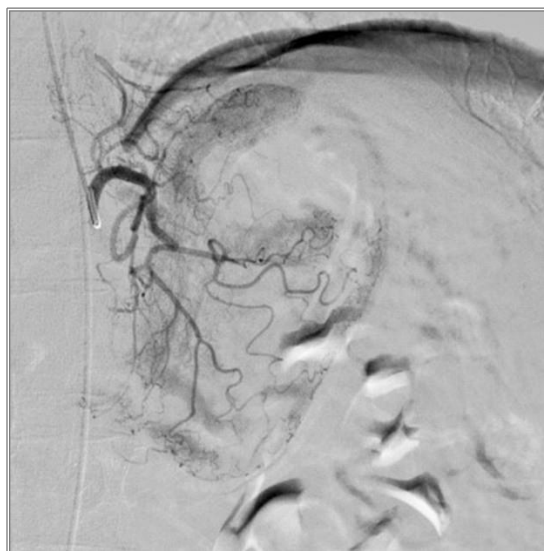


Figure 1. Selective angiography of the left gastric artery (the microcatheter is coaxially inserted), there are areas of unevenly increased contrast medium and abnormal neovascularity.

In the setting of the X-ray operation room, under the local anesthesia, the right common femoral artery was punctured (Seldinger technique) with the introduction of a 5 F catheter. The areas of unevenly increased contrast medium with the areas of abnormal neovascularity were visible during the selective angiography of the left gastric artery [Figure 1]. The microcatheter Progreat (Terumo) 2.8 Fr - 130 cm in size was coaxially inserted into the branch of the left gastric and gastric branches from the splenic artery. The mechanical

embolization was implemented by using the microspheres PVA-500 (COOK) 500-710 μm – 2 mL, the two detachable microcoils Azur 18 Detachable 6 mm x 20 cm and 4 mm x 15 cm with the use of the Azur detachment controller before the occlusion [Figure 2].

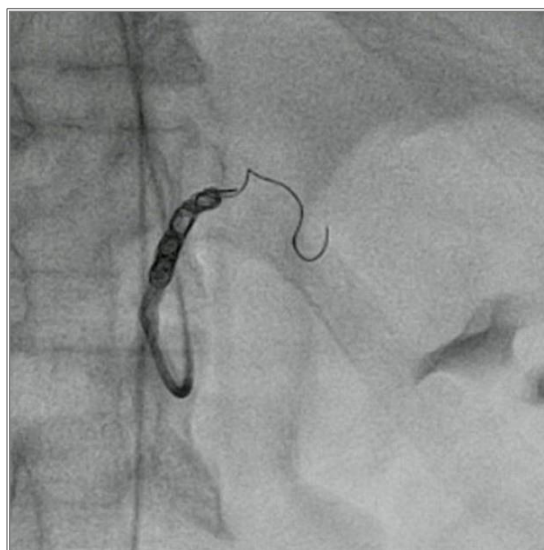


Figure 2. The control angiography: occlusion of the left gastric artery (the inserted microspheres are visible).

Three days after the embolization of the afferent vessels the control EGDS was performed: the signs of recurrent hemorrhage or ischemic zones were not detected.

In the course of the implemented treatment, the patient's condition has stabilized, hemoglobin level normalized (102 g/dL). Taking into consideration the lack of distant metastasis, relapsing gastric hemorrhage and the low-performance status it was decided to correct the immunological status and body weight abnormalities (body mass index 23,5) followed by gastrectomy and lymphadenectomy.

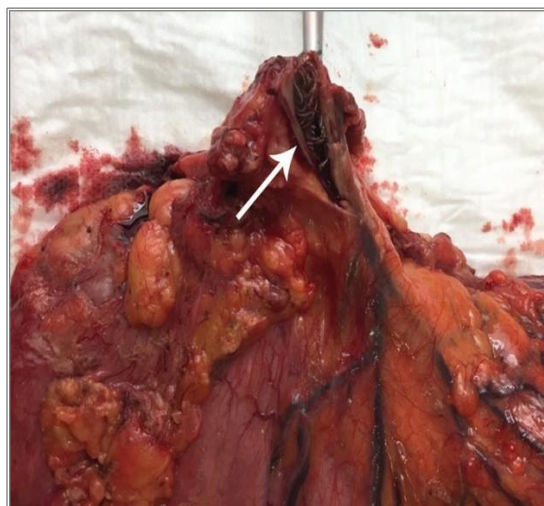


Figure 3. The gross specimen. The microcoils are visible in the lumen of the left gastric artery.

The patient was readmitted for gastrectomy and lymphadenectomy (D-2 lymph node dissection). We performed an upper middle laparotomy under the endotracheal anesthesia. The tumor of the gastric antrum 7 cm in diameter was revealed during revision. The tumor was located at the anterior wall of the stomach with the transition to the lesser gastric curvature. There were enlarged paragastric lymph nodes with no evidence of metastatic lesions. Paraaortic lymph nodes were not enlarged. We performed gastrectomy with omentectomy of the lesser and greater omentum with the ligation of the left and right gastric arteries, left and right gastro-omental arteries and D-2 lymph node dissection. Esophago-jejuno anastomosis was formed at the defunctionalized jejunal loop according to the Roux-en-Y technique with the use of a circumferential stapler (25 mm). The single-layer jejuno-jejunal anastomosis «end-to-side» was implemented. An enteric feeding tube was installed in the jejunum in the area of the entero-entero anastomosis. Hemostasis was implemented along

with the operation, the extent of blood loss was 200 ml. An additional (insurance) drain tube was installed right to the area of the anastomosis and brought outwards through a counter-opening in the right hypochondrium. Layer-by-layer wound suture was implemented. After the operation the gross specimen was examined: the microcoils that fully obturated the lumen of vessels were discovered in the main stem of the left gastric artery [Figure 3].

During the post-surgical period, no postoperative complications occurred. Histopathology report according to the gross specimen: moderately differentiated adenocarcinoma of the gastric antrum G2, with the focal perineural invasion and tumor embolus in the lumen of the choroid fissures. The tumor grows through the whole gastric wall, focally infiltrates the omentum to a depth of 0,3 cm, pT4a, pN3a, the IIIC stage.

Taking into consideration the disease state (pT4a pN3a M0, stage IIIC) and the prevalence of the neoplastic process, the implementation of 8 adjuvant chemotherapy courses according to the XELOX scheme and oncologist supervision according to the place of residence were recommended to the patient.

Five months later during the medical examination, the signs of advance of the oncological disease were not detected.

Discussion

The problem of treatment of gastric cancer, complicated by relapsing hemorrhage is still relevant. The amount of gastric cancer cases, complicated by relapsing hemorrhage reaches 41.5% [3,4]. In the structure of gastric hemorrhage non-ulcer cause reaches 10-55% [13,14]. Despite the modernization of the surgical techniques and methods of emergency treatment postoperative lethality of patients with bleeding gastric cancer reaches 50-60% [3,4].

More than two-thirds of gastric tumors are found in advanced stages III-IV stages of the process [15,16]. At advanced stages, most of the patients have different complications, and hence there is an urgent need for surgical treatment. The most frequent of them are hemorrhage, stenosis and sometimes tumor perforation with the development of peritonitis. In such cases, because of the extent of the pathologic process corresponding to stages III-IV, an appropriate surgical procedure is an extremely difficult task [3,11]. Among these complications perforation and hemorrhage are the most life-threatening [6,7].

Currently, there are three different approaches in medical literature to the treatment of locally advanced gastric cancer, complicated by hemorrhage [11,17]: 1) implementation of extensive radical surgery; 2) implementation of palliative surgery; 3) conservative therapeutic approach, based on the implementation of endoscopic hemostatic treatment/roentgen-endovascular intervention along with hemostatic and replacement of blood loss.

Radical intervention in relation to such patients is implemented in 19-53.6 % of cases [13,18]. Even after potentially radical surgeries most of the patients with locally advanced gastric cancer die due to tumor progression [15].

Palliative surgery for patients with locally advanced gastric cancer, complicated by hemorrhage implies the ligation of the artery that feeds the tumor [17], stitching of the bleeding tumor is an unfounded and unpromising method [19] since it is inefficient and can lead to recurrent hemorrhage. Frequently in case of recurrent hemorrhage from gastric cancer, there is a need to implement palliative subtotal gastric resection or gastrectomy.

Gastroscopy plays a significant and leading role in the detection of gastric cancer. The implementation of endoscopic treatment makes it possible to determine the diagnosis, describe the macroscopic type and the growth pattern of the tumor, specify its size and the localization, biopsy for the histological verification, to perform hemostasis.

Over the last years, medical practitioners started to use regional endovascular hemostasis to control bleeding from gastric tumors. This treatment mode is indicated for patients in case of inefficient endoscopic hemostasis and cases of high operative risk due to comorbidities or extensive neoplastic process. In the above-mentioned cases, such methods of endovascular hemostasis can be implemented as a selective infusion of vasoconstrictors or afferent vessel embolization. Endovascular procedures in case of malignant neoplasm of the gastrointestinal tract are seldom used [18,19]. The primary reasons for this are the high risk of development of ischemic stenosis or perforation of a hollow organ, which has only an arterial source of blood supply, as well as technical difficulties in the cannulation of small-diameter nutrient arteries.

Nowadays, there is no reasons to admit that the surgical treatment results of this contingent of patients are satisfied. The amount of postoperative lethality (15-20%) and the low index of operability and resectability of the tumor (on average 45-62.1%) confirm this statement [4,14,19]. There is a huge amount of post-surgery complications, and the five-year relative survival rates slightly exceed 20% of the total number of operated patients [20]. To a considerable extent these rates are connected with the hemostasis abnormalities, electrolyte changes, which determines the severity of the patient's condition and inoperability [4]. The selection of the treatment options and methods of the operative treatment for patients with bleeding gastric cancer is still a debatable issue [13,14,18]. The implemented methods of endoscopic hemostasis are not always the final methods that help to control hemorrhage from the degrading tumor.

The alternative methods of surgical treatment are the selective and super-selective embolization of the afferent vessel. The examination of the current medical literature attests to the fact that angiographic access with the arterial embolization can be implemented for the treatment of gastro-intestinal cancer complicated by hemorrhage when therapeutic alternatives are ineffective or the implementation of the therapeutic alternatives is impossible.

Conclusion

In this article, we present a case of surgical treatment of patients with advanced III stage gastric cancer (T4NxM0) complicated by bleeding from the tumor. The key point of the treatment was angiography with embolization of the afferent vessel, that provided blood supply to the stomach walls where the bleeding tumor was located. This allowed further examination and preparation for surgical treatment and chemotherapy. The postoperative period was uneventful. Signs of cancer progression were not detected.

The obtained experience allows us to conclude that the embolization of afferent vessels leads to the fact that the tumor is a fairly effective method for the treatment of gastric cancer complicated by bleeding. The introduction of microcoils with the depletion of a minimally invasive technique can be both a supplement and an alternative to the endoscopic and surgical treatment of gastric cancer complicated by a relapse of bleeding.

Conflict of interest

All authors declare that they have no conflict of interest.

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