

# **TOTAL EXTENDED GASTRECTOMY IN ADVANCED GASTRIC CANCER – CLINICAL CASE**

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## **Summary**

With over one million newly diagnosed cases in 2018, gastric cancer remains the fifth most common malignancy worldwide. Early detection of the disease is challenging as most patients are asymptomatic. The lack of screening programs leads to detection at an advanced stage and worsens the prognosis. Using biomarkers or endoscopic methods for early diagnosis would reduce the mortality from gastric cancer. We present a case of total extended (TEG) in advanced gastric cancer and a literature review of indications and complications of this treatment.

**Keywords:** gastric cancer, gastric adenocarcinoma, total gastrectomy, precancerous stomach lesion.

## **Introduction**

Gastric cancer is the fifth most common cancer globally and ranks third as a leading cause of cancer death worldwide [1]. Detection of early forms is crucial as it significantly improves the five-year survival prognosis [2]. The gold standard in diagnosing gastric cancer is esophagogastroscope with biopsy. However, Pimenta-Melo et al. reported that 9.4% of gastric carcinomas are missed during standard gastroscopy [3]. Another problem in making the diagnosis in cases of advanced gastric cancer. For this reason, gastric cancer is the third leading cause of death worldwide [4].

According to Lauren's first classification, gastric cancers can be intestinal and diffuse [5]. The diffuse type is rarer and affects primarily young people and, more often, women. In contrast, the intestinal type is common, affecting mostly adults, more often men. The intestinal type is also known as adenocarcinoma because it forms glands and tubules covered by epithelium that resembles intestinal mucosa. This type has a cohesive structure, unlike the diffuse type in which individual cells or small clusters of cells invade tissues. Lauren's updated classification adds a third additional mixed type, solid gastric cancer, which has similarities with the previous

two [6].

According to its location, the tumor can be cardial and distal [7]. In recent years, cardial location has become more frequent at the expense of distal localization. However, in some gastroesophageal junction (GEJ) tumors, it is difficult to determine where the process originates. Adenocarcinomas of the GEJ tend to be aggressive, infiltrate the esophageal walls, and metastasize to local lymph nodes. On the other hand, distal localization is also a challenge for the surgeon because the duodenum and pancreas are involved in the advanced stages of the disease. A delayed diagnosis leads to poor overall outcomes, decreased five-year survival, dissemination of the process, and chemotherapy resistance [8].

The extent of surgical intervention depends on the location of the tumor, its size, the depth of invasion, and the presence of metastases and lymph node involvement. Depending on the stage of the disease, the approach may vary from endoscopic submucosal dissection to distal esophagectomy and subtotal or total gastrectomy.

## Case Presentation

We present the case of a 76-year-old man hospitalized and treated at another institution for acute upper gastrointestinal bleeding manifested by melena and anemic syndrome. After fibrogastroscopy with biopsy, a low-

differentiated tubular adenocarcinoma was histologically proven. Erythrocyte hematotransfusions partially compensated for the anemic syndrome. After discharge from the hospital, the patient complained of general weakness, feebleness, intermittent vomiting of undigested food, and melena. Comorbidities included hypertension, diabetes mellitus, and cerebrovascular disease. As his general health worsened, he was admitted to the Department of Surgery, St. Marina Hospital.

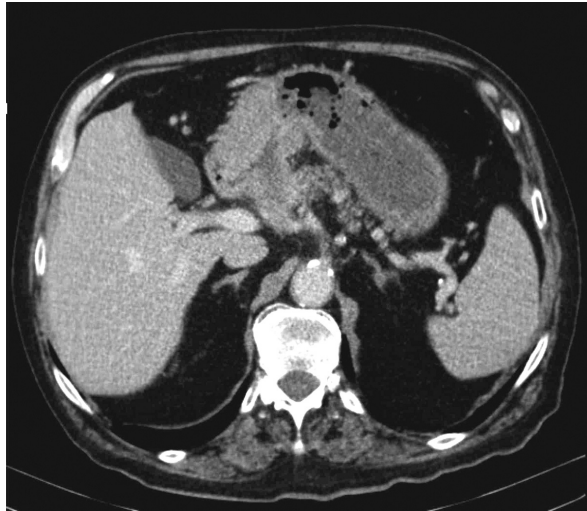
The laboratory tests performed revealed HGB 83 g/l; RBC  $3.24 \times 10^{12}/l$ ; HCT 0.24 l/l; MCV 74.6 fL; WBC  $14.4 \times 10^9/l$ ; PLT  $827 \times 10^9/l$ ; prothrombin time 73%; INR 1.2; fibrinogen 5.08 g/l; glucose 9.54 mmol/l; creatinine 89  $\mu\text{mol}/l$ ; urea 10.5 mmol/L; total bilirubin 17.2  $\mu\text{mol}/l$ ; direct bilirubin 4.7  $\mu\text{mol}/l$ ; total protein 59.8 g/l; albumin 36.6 g/l; ASAT 17 U/l; ALAT 19.5 U/l; GGT 32 U/l; AP 117 U/l.

Computed tomography revealed a stenotic lumen infiltrative neoplastic process in the antrum and the pylorus, also involving the duodenal bulb (Figure 1). The tissues adjacent to and towards the body of the pancreas were suspected of infiltrative changes (Figure 2 and 3). There were no palpable pathological changes in the other abdominal organs. There was no CT evidence of pathologically enlarged perigastric, mesenteric and retroperitoneal lymph nodes.

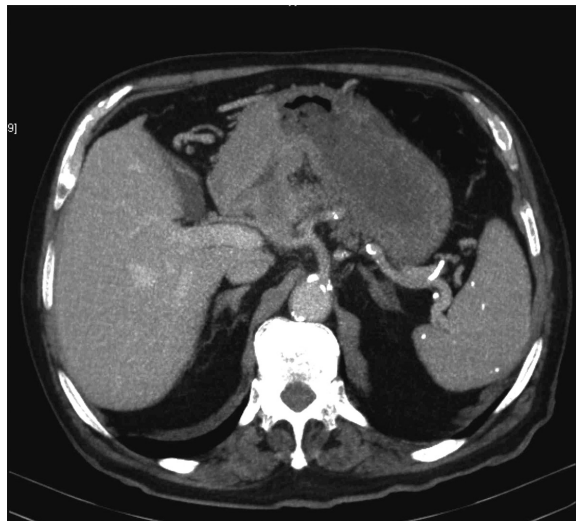
The patient got worse, and there was no effect on the bleeding from the conservative therapy. We proceeded to surgical treatment. Total



**Figure 1.** CT scan of the abdomen – coronal plane volume reconstruction, showing stenotic lumen infiltrative process in stomach.



**Figure 2.** Contrast enhanced CT scan of the abdomen – axial plane, showing stenotic lumen infiltrative process in stomach.



**Figure 3.** Contrast enhanced CT scan of the abdomen - axial plane MIP reconstruction, showing the stenotic lumen infiltrative process in stomach.

gastrectomy was performed, with D2 lymph node dissection around a. hepatica communis, tr. coeliacus, and lig. hepatoduodenale. Infiltrations to the body and tail of the pancreas were found and resected. The spleen was removed because of intraoperative thrombosis of a. lienalis. The passage was restored by a retrocolic T-L esophago-jejunal anastomosis, and an L-L entero-entero anastomosis was performed at 60 cm from the anastomosis.

Histology verified a gastric wall with total infiltration of low-differentiated tubular adenocarcinoma G2 without the mucus-producing activity of the neoplastic epithelium. Of the 51 lymph nodes examined, metastases from the same adenocarcinoma were found in seven. Massive infiltration into the pancreatic

material was also proven histologically.

In the early postoperative period, the patient developed acute respiratory failure with decreased saturation, necessitating continuous oxygen therapy. He was given artificial pulmonary ventilation and intensive treatment with antibiotics, corticosteroids, saline infusions, low molecular weight heparin, erythrocyte replacement therapy, human serum albumin, and fresh frozen plasma during the postoperative period. Given the enormous volume of the surgical intervention, the worsening respiratory and cardiovascular failure, hypoproteinemia, and the endotracheal intubation, the patient passed away, notwithstanding the resuscitation we applied.

## Discussion

Complete surgical resection remains the only option for definitive treatment of gastric cancer. Total gastrectomy in a damaged terrain is associated with high perioperative mortality [9, 10]. Various risk factors play a role: age, preoperative comorbidity, open surgical approach, and multi-organ resection [9, 11]. Lymphadenectomy, along with gastrectomy, is performed to achieve complete oncologic resection and staging of the stomach, although lymphadenectomy remains controversial [12]. Various studies have compared the survival between D1 (perigastric lymph nodes only), D2 (perigastric and ciliary lymph nodes), and D3 (perigastric, ciliary, and paraaortic lymph nodes). According to data from a large Dutch study lasting 15 years, patients with D2 lymph node dissection (LD) have better disease-specific survival than those with D1 [13]. However, overall survival was similar in both approaches. In contrast, according to a systematic review, Cochrane et al. published data showing that D2 LD is associated with better survival but higher postoperative mortality [14]. Complications related to this type of surgical intervention range from 24% to 65% in different studies, with severe complications reported in about 30% of the cases [9, 15].

The patient we present had multifocal involvement by gastric carcinoma against a background of aggravated comorbidity. Late diagnosis of the disease increases the risk of an adverse outcome [16]. Polyorgan resection, including total D2 gastrectomy with resection of the body and the pancreas and spleen, is an R0 resection and is both a merely oncological indication and emergency control of bleeding [17].

The absence of organ metastases and only local infiltration makes it possible to perform such an intervention.

According to the latest data from the National Cancer Registry of Bulgaria for 2016 and 2017, the highest percentage (34.1%) of GCs are diagnosed at stage IV. The lack of screening programs in Bulgaria to detect precancerous gastric conditions deters the intervention of gastroenterologists, surgeons, and oncologists. It limits the therapeutic options of the treating team.

## Conclusion

Gastric cancer remains among the most common malignancies worldwide. Adequate surgical treatment often involves total gastrectomy. The large volume of surgical intervention leads to complications and poor outcomes in some cases. Early diagnosis of precancerous lesions and initial forms of the disease significantly improve the 5-year survival rate. Introducing screening programs in daily clinical practice would help reduce gastric cancer morbidity and mortality.

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