

Gastric cancer

Gastric cancer is a cancer of the stomach wall that is currently the fourth leading cause of cancer death in Europe. It is the second most common malignant disease worldwide. Gastric cancer develops through a complex multistage process with several distinct histological and pathophysiological phases. The whole development is influenced by a complex of interactions between bacteria, the environment, the genetic dispositions of the host and molecular mechanisms. Many of the etiologies and pathogenesis of this disease remain unclear, but the underlying context is already known.

Epidemiology

Gastric cancer is an exception among cancers, as its incidence and mortality have **decreased** significantly in the last 25 years. The incidence decreased by about one third and the mortality due to improved therapeutic options by up to half. We can observe a completely opposite trend in colorectal cancer, the incidence of which, on the other hand, is still rising and our country is one of the world's leading figures.^[1]

The highest incidence in each country shows the highest incidence in **Japan and Asian countries**, allegedly due to the high content of nitrosamines and nitrosamides in fish feed. In the Czech Republic, the incidence reaches **15:100,000 inhabitants** (according to *IHIS CR*).^[2]

Men are more often affected than women and the risk increases gradually with age, with the highest incidence at **70-74 years**.



Incidence of gastric cancer in the world.

Etiology of gastric cancer

It varies according to the histological type of the tumor. According to Lauren's classification, we distinguish between intestinal and diffuse types. **The intestinal type** is most often caused by *H. pylori* infection, exposure to carcinogens from food and tobacco smoke, and many other factors. Although gastric adenocarcinoma is sporadic in the vast majority of cases, there are also familial forms, mainly associated with the **diffuse type**.^[3]

The main risk factors include:

- smoking and consumption of hard alcohol,
- dietary carcinogens (smoking, salting, nitrosamines, polyaromatic hydrocarbons - PAHs),
- chronic diseases:
 - atrophic gastritis,
 - Menetrier's disease,
 - achlorhydria,
 - pernicious anemia,
 - gastroesophageal reflux,
- gastric resection II. type (especially the area of anastomoses).
- polyposis adenomas,

Gastric polyps, if they do not have villous structures, are not considered precancerous lesions, however, it is recommended to remove all polyps larger than 2 cm, as the risk of villous structures and thus malignancy increases with size.

- infection by *H. pylori*

For more information, see The role of Helicobacter pylori in the pathogenesis of gastric cancer

Symptomatology

The initial symptomatology of the disease is very non-specific (pain and pressure in the epigastrium, anorexia, weight loss, weakness, fatigue, nausea, belching, bad breath). Passage disorders can also occur, usually manifested by more frequent vomiting. Enlargement is manifested by enlarged left supraclavicular nodes (**Virchow-Troisier**) and ascites.

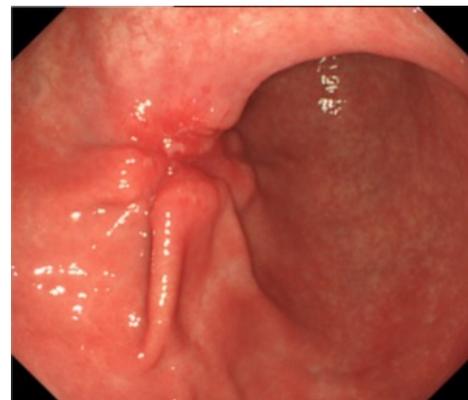
In advanced stages, there are dominant manifestations of **complications**:

- bleeding into the GIT - - mostly occult, it can also manifest as melena,
- pylorostenosis - followed by cachexia,
- perforation - peritonitis,
- fistula between stomach and colon transversum - malnutrition from protein loss,
- cardiac obstruction dysphagia.

Diagnosis

A patient with the symptomatology mentioned above should be consulted at the outpatient clinic of a gastrointestinal doctor who will perform a basic examination (**anamnesis** and **physical examination**). From the physical examination, we can observe, if present, palpable nodal metastases above the left collarbone (Virchow's node). The basic examination leading to the confirmation or refutation of the diagnosis of gastric cancer is **endoscopic examination** (gastroscopy), during which we take a multiple biopsy sample for histological verification of the finding. We can also perform cytology of gastric contents or endosonography.

In case of a positive histological finding, we always perform **CT of the patient's abdomen** , in cardiac and CT mediastinal tumors, in order to assess the size and location of the tumor and its growth through the stomach wall, or into other structures and infiltration of lymph nodes. We also note metastatic infiltration of other organs (especially the liver), if present. In women, we think of a possible metastatic ovarian disease (Krukenberg tumor). As part of pre-treatment staging, we also perform **lung X-rays** .



Gastroscopy: Gastric carcinoma

Based on the histological findings and CT, the team of gastroenterologist, surgeon and clinical oncologist determines the treatment options for the patient.

From other examinations we perform:

- **Stomach X-ray or X-ray** with contrast agent,
- **blood test**
 - blood count - we can find signs of microcytic hypochromic anemia in corneal bleeding
 - tumor markers (CEA, CA 19-9, CA72-4) - rather than the diagnostic effect, these values are used to evaluate the success of subsequent treatment and further course of the disease,
- liver ultrasonography to detect metastases,
- bone scintigraphy.

Pathology of gastric cancer

Gastric carcinoma (more precisely, adenocarcinoma) is the most common neoplasia of the stomach wall. The Lauren classification distinguishes between two types of gastric cancers, diffuse and intestinal.

The diffuse type is usually associated with an unfavorable prognosis, as it often shows a strong tendency to invade the surrounding tissue. Tumor cells of this type lose cohesion and original function. Compared to the intestinal type, its pathogenesis is much less studied.

The intestinal type has well-defined stages of development and tumor cells form into functional glands of the gastrointestinal tract.

For more information, see Pathology of gastric adenocarcinoma.

Therapy

The only potentially curative method of treatment is partial or complete **gastrectomy** . In addition, **endoscopic resection** , **chemotherapy** and **radiotherapy** are used . An important component of caring for a patient with gastric cancer is palliative care and the provision of adequate nutrition due to the high risk of cachectization.

Endoscopy

The endoscopic solution can be used both in very early stages of the disease (carcinoma in situ, T1), when we perform mucosectomies, and in very advanced tumors, when we palliatively apply stents to maintain cardiac patency.

Surgery

Surgical treatment is most important for low radiosensitivity. However, patients often come in late stages with an inoperable tumor (then only a palliative procedure supplemented by adjuvant chemo- and/or radiotherapy):

- gastrectomy with lymphadenectomy, omentectomy, event. with splenectomy;
- palliative gastroenteroanastomosis to maintain patency.

Sufficient radical surgery is necessary for the success of the treatment, a resection line 5-6 cm from the tumor is required. Resection of liver metastases does not affect survival.

Type of surgery:

- antrum tumor: subtotal gastrectomy;

- tumor in the stomach body: total or subtotal gastrectomy (according to location - 5 cm resection line required);
- tumor in the fundus: fundectomy (proximal 2/3 gastric resection) or total gastrectomy (according to tumor size and nodal involvement).

Chemotherapy

Palliative or adjuvant, eg. FAM (5-fluorouracil, adriamycin, mitomycin C), FAMtx (5-FU, adriamycin, methotrexate), FAB (5-FU, adriamycin, carmustine). More recently, the combination of EAP (etoposide, adriamycin, cisplatin), is preferred, which has a higher therapeutic response, but also higher toxicity.

Radiotherapy

Only **palliatively in inoperable carcinomas** (however, in lymphomas it can lead to complete remission), brachyradiotherapy in the GE area to maintain patency. We use radiation at a dose of 40-45 Gy. The limit of the dose used is mainly the surrounding structures (kidneys, small intestine, liver, spinal cord).

Neoadjuvant concomitant chemoradiotherapy (5FU + irradiation) is now used at some foreign workplaces, which helps to reduce the tumor and thus improve its operability.

Targeted therapy

Trastuzumab treatment is indicated for palliative treatment of HER2 receptor overexpressing gastric adenocarcinoma (10-25% of tumors) .^[4]

Prognosis

The prognosis for five-year survival is about 90% in clinical stage Ib, about 20% in stage IV (M0). More advanced forms are almost always infamous. In case of disease recurrence after surgery, few patients survive one year.

Literature

Related articles

- Gastroduodenal ulcer disease
- Stomach tumors
- Determination of antibodies against *Helicobacter pylori*
- *Helicobacter pylori*
- Pathology of gastric adenocarcinoma

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Recommended literature

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