

GASTRIC CANCER

Carcinoma of the stomach is a major cause of cancer mortality worldwide. Its prognosis tends to be poor with cure rates little better than 5–10%, although better results are obtained in Japan where the disease is common.

Incidence

There are marked variations in the incidence of gastric cancer worldwide.

- In the UK the incidence is approximately 15 cases per 100 000 population per year.
- In the USA 10 cases per 100 000 population per year.
- In Eastern Europe 40 cases per 100 000 population per year.
- In Japan the disease is much more common, with an incidence of approximately 70 cases per 100 000 population per year.
- There are small geographical areas in China where the incidence is double that in Japan. These

Underlying epidemiological data make it clear that this is an environmental disease. In general, men are more affected by the disease than women.

Etiology

Gastric cancer is a multifactorial disease:

1. Epidemiological studies point to a role for *H. pylori*. Studies reveal a correlation between the incidence of gastric cancer in various populations and the prevalence of *H. pylori* infection. *H. pylori* seems to be principally associated with carcinoma of the body of the stomach and the distal stomach rather than the proximal stomach. As *Helicobacter* is associated with gastritis, gastric atrophy,
2. Patients with pernicious anemia and gastric atrophy are at increased risk, as are those with gastric polyps.
3. Patients who have had peptic ulcer surgery, particularly those who have had drainage procedures such as gastroenterostomy or pyloroplasty, are at approximately four times the average risk. Presumably, duodenogastric reflux and reflux gastritis are related to the increased risk of malignancy in these patients.
4. Carcinoma is associated with cigarette smoking and dust ingestion from a variety of industrial processes.
5. Diet appears to be important. The high incidence of gastric cancer in some pockets in China is probably environmental and probably diet related. The ingestion of substances such as spirits may induce gastritis and, in the long term, cancer. Excessive salt intake, deficiency of antioxidants and exposure to N-nitroso compounds are also implicated.
6. Genetic factors are also important.

Clinical features

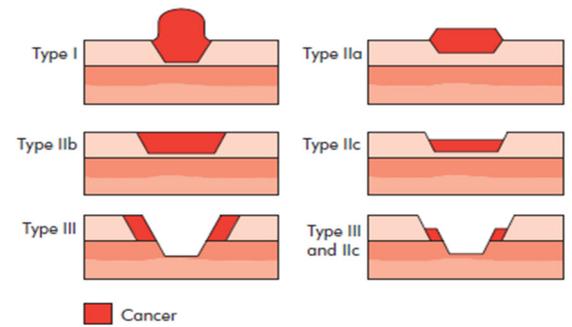
The key to improving the outcome of gastric cancer is early diagnosis, although in Japan there is a screening program, most curable are picked up by use of gastroscopy in patients with dyspepsia.

- In advanced cancer bloating, distension and vomiting may occur.
- The tumor frequently bleeds, resulting in iron-deficiency anemia.
- Obstruction leads to dysphagia, epigastric fullness or vomiting. With pyloric involvement the presentation may be of gastric outlet obstruction.
- Metastatic lymph nodes may be palpable, most notably in the left supraclavicular fossa (Virchow's node, Troisier's sign).
- Non-metastatic effects of malignancy are seen, particularly thrombophlebitis (Trousseau's sign) and deep venous thrombosis. These features result from the effects of the tumor on thrombotic and hemostatic mechanisms.

Pathology

Gastric cancer can be divided into early gastric cancer and advanced gastric cancer.

Early gastric cancer can be defined as cancer limited to the mucosa and submucosa with or without lymph node involvement (T1, any N), it can be protruding, superficial or excavated. Early gastric cancer is curable, and even early gastric cancers associated with lymph node involvement have 5-year survival rates in the region of 90%.



Advanced gastric cancer involves the muscularis. Its macroscopic appearances have been classified by Bormann into four types. Types III and IV are commonly incurable.

Spread of carcinoma of the stomach

Direct spread

- The tumor penetrates the muscularis, serosa and ultimately adjacent organs such as the pancreas, colon and liver.

Lymphatic spread

- This is by both permeation and emboli to the nodes. This may be extensive, with the tumor even appearing in the supraclavicular nodes (Troisier's sign).

Blood-borne metastases

- Blood-borne metastases occur first to the liver and subsequently to other organs, including lung and bone.

Transperitoneal spread

- This is a common mode of spread once the tumor has reached the serosa of the stomach and indicates incurability. Tumors can manifest anywhere in the peritoneal cavity and commonly give rise to ascites. Advanced peritoneal disease may be palpated either abdominally or rectally. The ovaries may sometimes be the sole site of transcoelomic spread (Krukenberg's tumors). It may spread via the abdominal cavity to the umbilicus (Sister Joseph's nodule). Transperitoneal spread of gastric cancer can be detected most effectively by laparoscopy and cytology.

Treatment:

It is important that patients with incurable disease are not subjected to radical surgery that cannot help them, hence the value of CT/PET.

Evidence of inoperability is:

- Hematogenous metastases.
- Involvement of the distant peritoneum.
- N4 nodal disease and disease beyond the N4 nodes.
- Fixation to structures that cannot be removed.

Most operable patients should have neoadjuvant chemotherapy.

Total gastrectomy

This is best performed through a long upper midline incision. The stomach is removed en bloc, including the tissues of the entire greater omentum and lesser omentum. Gastrointestinal continuity is reconstituted by means of a Roux loop oesophagojejunostomy.

Subtotal gastrectomy

For tumors distally placed in the stomach it appears unnecessary to remove the whole stomach. However, a subtotal gastrectomy is very similar to a total gastrectomy except that the proximal stomach is preserved.

Palliative surgery

In patients suffering from significant symptoms of either **obstruction** or **bleeding**, palliative resection is appropriate. A palliative gastrectomy need not be radical and it is sufficient to remove the tumor and reconstruct the gastrointestinal tract.

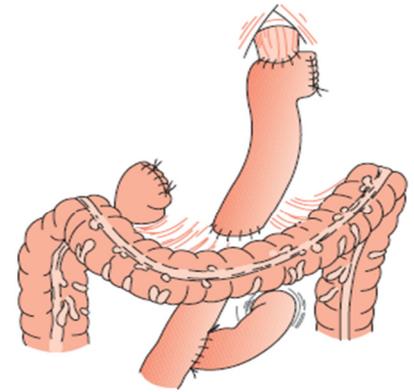


Figure 60.32 Oesophagojejunostomy Roux-en-Y.

Sometimes it is impossible to resect an obstructing tumor in the distal stomach and other palliative procedures need to be considered, although the prognosis in such patients is poor. A high gastroenterostomy or a Roux loop with a wide anastomosis between the stomach and jejunum may be done. Gastric exclusion and oesophagojejunostomy are practised by some surgeons. For inoperable tumors situated in the cardia, either palliative intubation, stenting or another form of recanalization can be used.

Other treatment modalities

Because of the failure of radical surgery to cure advanced gastric cancer, there has been interest in the use of radiotherapy and chemotherapy.

Radiotherapy

Radiotherapy has a role in the palliative treatment of painful bony metastases.

Chemotherapy

Gastric cancer may respond well to combination cytotoxic chemotherapy and neoadjuvant chemotherapy improves the outcome following surgery.

GASTRIC LYMPHOMA

It is first important to distinguish **primary gastric lymphoma** from involvement of the stomach in a **generalised lymphomatous** process. This latter situation is more common than the former.

The incidence of lymphoma seems to be increasing. Primary gastric lymphoma accounts for approximately 5% of all gastric neoplasms. Gastric lymphoma is most prevalent in the sixth decade of life.

The presentation is no different from gastric cancer. The common symptoms being pain, weight loss and bleeding, perforation or obstruction are not common.

Primary gastric lymphomas are B cell-derived, the tumor arising from the mucosa-associated lymphoid tissue (MALT). Primary gastric lymphoma remains in the stomach for a prolonged period before involving the lymph nodes. At an early stage, the disease takes the form of a diffuse mucosal thickening, which may ulcerate. Diagnosis is made as a result of the endoscopic biopsy and seldom on the basis of the endoscopic features alone, which are not specific. Following diagnosis, adequate staging is necessary, primarily to establish whether the lesion is a primary gastric lymphoma or part of a more generalised process. CT scans of the chest and abdomen and bone marrow aspirate are required, as well as a full blood count. Although the treatment of primary gastric lymphoma is somewhat controversial, it seems most appropriate to use surgery alone for the localised disease process. No benefit has been shown from adjuvant chemotherapy, although some oncologists contend that primary gastric lymphoma can be treated by chemotherapy alone.

Chemotherapy alone is appropriate for patients with systemic disease.

DUODENAL TUMORS

Benign duodenal tumors

Duodenal villous adenomas occur principally in the periampullary region. Although generally uncommon, they are often found in patients with familial adenomatous polyposis. The appearances are similar to those of adenomas arising in the colon and, as they have malignant potential, they should be locally excised with histologically clear margins.

Duodenal adenocarcinoma

It's uncommon.

NEUROENDOCRINE TUMORS

A number of neuroendocrine neoplasms occur in the duodenum.

- It is a common site for primary gastrinoma (Zollinger–Ellison syndrome).
- Non- functioning neuroendocrine tumors (usually called carcinoid tumors) also occur but uncommonly in

Zollinger–Ellison syndrome

The gastrin-producing endocrine tumor is often found in the duodenal loop, although it also occurs in the pancreas, especially the head.

It is a cause of persistent peptic ulceration. It was recognizable from gastric secretory studies in which the patient had a very high basal acid output but no marked response to pentagastrin, as the parietal cell mass was already nearly maximally stimulated by pathological levels of gastrin. The advent of proton pump inhibitors has rendered this extreme endocrine condition fully controllable, but also less easily recognized.

Gastrinomas may be either sporadic or associated with the autosomal dominantly inherited multiple endocrine neoplasia (MEN) type I (in which a parathyroid adenoma). The tumors are most commonly found in the 'gastrinoma triangle' defined by the junction of the cystic duct and common bile duct superiorly, the junction of the second and third parts of the duodenum inferiorly, and the junction of the neck and body of the pancreas medially (essentially the superior mesenteric artery).

In MEN type I, the tumors may be multiple and the condition is incurable. Even in this situation, as with sporadic gastrinoma, surgical treatment should be employed to remove any obvious tumors and associated lymphatic metastases, as the palliation achieved may be good.