Gastric tumours

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Abstract

The majority of gastric tumours are adenocarcinomas. Rarer types include gastrointestinal stromal tumours (GISTs), carcinoids and lymphomas. Gastric adenocarcinoma is a common cancer worldwide with the highest rates in the Far East. In the UK the majority of patients with gastric adenocarcinoma present with advanced, incurable disease. Accurate disease staging is essential to identify those patients suitable for curative treatment. Staging involves the use of endoscopy, CT, PET–CT, endoscopic ultrasound, staging laparoscopy and bone scintigraphy. A fitness assessment is an essential part of the staging process. Early gastric adenocarcinoma may be treated with endoscopic mucosal resection. The mainstay of curative treatment is surgery commonly in the form of subtotal or total gastrectomy. Patients with locally advanced tumours should be considered for peri-operative chemotherapy. In the West this is according to the MAGIC trial. The overall prognosis from gastric adenocarcinoma is poor. In patients who undergo surgery, 5-year survival rates of 45% can be achieved. Gastric GISTs are managed according to the risk of malignant behaviour. The majority of carcinoids and lymphomas are managed non-operatively.

Keywords Gastrectomy; gastric adenocarcinoma; GIST; peri-operative chemotherapy; stomach

Introduction

The management of gastric cancer is dictated by the histological type of the tumour. The most common type by far is adenocarcinoma. Rarer tumour types include gastrointestinal stromal tumours (GISTs), carcinoids and lymphomas.

Gastric adenocarcinoma

Epidemiology

Gastric adenocarcinoma is the fourth most common cancer worldwide with the highest incidence found in the Far East. The rates in the West are considerably lower. In the UK approximately 7000 new cases are diagnosed each year. Over 75% of patients diagnosed are over the age of 75.[1] It is twice as common in men as women. Risk factors for gastric cancer are shown in Box 1.

Pathology

In the West, gastric adenocarcinoma is classified histologically according to the Lauren classification into intestinal, diffuse and mixed types. Intestinal-type tumours are usually well demarcated and commonly found in the distal stomach and are associated with *Helicobacter pylori* (*H. pylori*) infection (Figure 1). By contrast diffuse-type tumours are infiltrative and found in the proximal body of the stomach commonly leading to linitis plastica of the stomach.

The staging of gastric adenocarcinoma is performed according to the TNM classification system. This assesses the primary tumour (T), local and regional lymph nodes (N) and distant metastatic (M) spread. Metastatic dissemination may be through direct invasion, or via haematogenous, lymphatic or transcoelomic spread. The current TNM classification (TNM 7th edition) categorizes nodal disease by total number of nodes involved rather than anatomical location of the involved nodes. The full TNM classification is provided in Box 2. Patients with tumour involving only the mucosa or submucosa (T1a and T1b) irrespective of the status of nodal disease are considered to have early gastric cancer.

Symptoms

Early gastric cancer is frequently not associated with symptoms. In Japan the high incidence of gastric cancer has lead to the introduction of screening programmes for asymptomatic patients. In the UK the focus has been on early referral for endoscopy for symptomatic patients. The earliest symptom is commonly dyspepsia. Over the age of 55 any new-onset and persisting dyspepsia should be investigated. In younger patients guidelines state that dyspepsia should be associated with other alarm symptoms such as vomiting, weight loss and anaemia. Many of these symptoms are markers of advanced disease and 80% of patients presenting with gastric cancer have incurable

Risk factors for gastric adenocarcinoma

Genetic

- Hereditary diffuse gastric cancer syndrome (CDH1)
- Hereditary non-polyposis colorectal cancer
- Li–Fraumeni syndrome
- Familial adenomatous polyposis
- Peutz–Jeghers syndrome
- Juvenile polyposis
- Blood group A
- Male: female

Environmental

- *Helicobacter pylori*
- Smoking
- Obesity
- Vitamin A, C and E deficiencies

Premalignant conditions

- Pernicious anaemia
- Gastric polyps
- Gastric intraepithelial dysplasia
- Gastric ulcer
- Menetrier's disease
- Previous gastric surgery

Box 1

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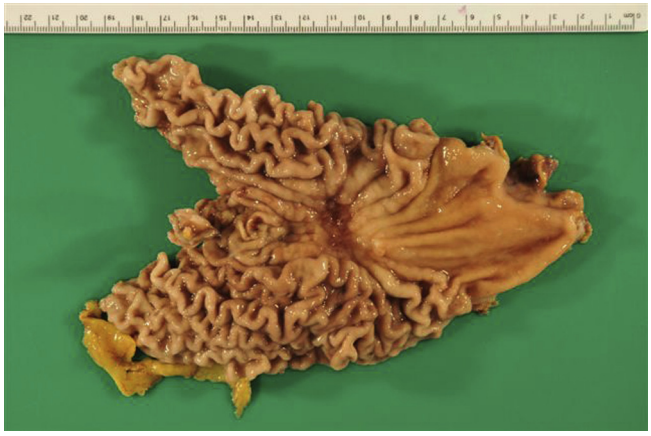

Figure 1 Resection specimen of an advanced distal gastric adenocarcinoma (intestinal type).

disease at the time of diagnosis. The two week referral pathway has sought to streamline the process of referral for investigation for patients who meet these criteria. The two week pathway has been shown to reduce the time to diagnosis but has no effect on these survival rates.[2]

A small number of patients with gastric adenocarcinoma are diagnosed at an acute presentation with major upper gastrointestinal haemorrhage or gastric outlet obstruction.

Investigation and staging

While a small proportion of patients will have their cancer diagnosed with cross-sectional imaging or barium swallow, the initial investigation for patents with suspected gastric adenocarcinoma should be upper gastrointestinal endoscopy (Figure 2). At endoscopy multiple biopsies must be taken to allow for histological confirmation of the diagnosis to be made. In addition accurate measurements of the tumour and its distance from the oesophago-gastric junction and pylorus should be recorded as well as its position on the wall of the stomach itself. This is essential to help plan treatment. Patients with suspected gastric cancer should not be prescribed proton pump inhibitors (PPIs) prior to endoscopy. It is possible for ulceration associated with some early gastric cancers to heal with PPIs therefore increasing the risk of the cancer being missed by the endoscopist.

Once diagnosed, all patients with gastric adenocarcinoma (irrespective of stage of disease) should be referred to a regional oesophago-gastric cancer unit for further staging investigations. The staging protocol for gastric cancer is complex and must be tailored to individual patients. Once metastatic disease has been proven, additional unnecessary tests should be avoided.

An essential part of the staging pathway is an assessment of patient's fitness. This should be performed early to prevent unnecessary invasive and costly investigations being carried out. All patients require a thorough history and examination. Routine blood tests should be taken. Formal cardiopulmonary exercise testing (CPX) forms a valuable part of the patient assessment and helps determine suitability for treatment. Additional tests such as lung function and echocardiography should be used based on past medical history and examination findings. Prior to any treatment, specific health issues should be optimised with the involvement of appropriate specialists.

Staging modalities

Computed tomography (CT): high-resolution CT scanning of the chest abdomen and pelvis should be performed in all patients. Intravenous contrast should be administered, with the patient given water to drink prior to the scan to ensure adequate gastric distension. Without this distension identification of the primary tumour may be impossible. CT is able to identify the majority of

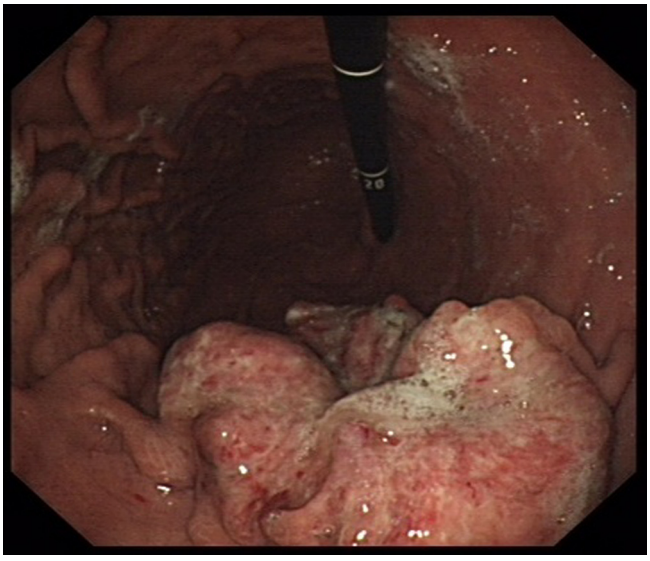

Figure 2 Endoscopic appearance of a diffuse type gastric adenocarcinoma (viewed in retroflexion).

TNM classification (7th edition) of gastric adenocarcinoma

T category definitions

- Tx — Primary tumour cannot be assessed
- T0 — No evidence of primary tumour
- Tis — Carcinoma in situ
- T1a — Tumour invades lamina propria or muscularis mucosae
- T1b — Tumour invades submucosa
- T2 — Tumour invades muscularis propria
- T3 — Tumour penetrates subserosal connective tissue without invasion of serosa
- T4a — Tumour invades serosa
- T4b — Tumour invades adjacent structures

N category definitions

- Nx — Regional lymph node(s) cannot be assessed
- N0 — No regional lymph node metastasis
- N1 — Metastasis in 1–2 regional lymph nodes
- N2 — Metastasis in 3–6 regional lymph nodes
- N3 — Metastasis in 7 or more regional lymph nodes

M category definitions

- Mx — Distant metastatic disease cannot be assessed
- M0 — No metastatic disease
- M1 — Metastatic disease present

Box 2