Gastric cancer

Dr Lim Lee Guan
Consultant
Department of Gastroenterology and Hepatology
National University Health System
Introduction

- Gastric cancer
  - one of the most common forms of cancer worldwide
  - approximately 870,000 new cases and 650,000 deaths per year [1,2]
  - accounts for about 10% of new cancers [3].

### Declining mortality from gastric cancer

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<tr>
<td>Northern Ireland</td>
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<td>-40.7</td>
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</table>


Gastric Cancer Incidence (ASR)

Stomach, Males
Age-Standardized incidence rate per 100,000

Stomach, Females
Age-Standardized incidence rate per 100,000

Globoscan, IARC 2002

Males

Japan: 59.9
China: 32.3
Singapore: 25.6
Sweden: 8.6
USA: 7.3

Females

Japan: 23.8
China: 17.8
Singapore: 12.4
Sweden: 4.4
USA: 3.1

Globoscan, IARC 2002
Figure 2: Age-standardised incidence of gastric cancer in Asian men

Lancet Oncol 2008; 9: 279–87
Epidemiology in Singapore

- Gastric cancer is
  - 5th commonest cancer in males
  - 7th commonest cancer in females
- The age-standardised rate of gastric cancer is
  - 21.4 per 100,000 per year in Chinese males
  - 10.8 per 100,000 per year in Chinese females
- The lifetime risk for stomach cancer in Chinese men is about one in 50.

Risk factors

- **Helicobacter pylori**
  - at least 2x increased risk of developing gastric cancer

- **Smoking**
  - increases the risk of gastric cancer, especially intestinal cancer of the distal stomach, by about 2x

- **Vegetable and fruit**
  - associated with a low risk of gastric cancer, presumably because of antioxidant

- **Excessive dietary salt intake**
  - associated with gastric cancer.
Risk factors

- **Family history**
  - The risk of stomach cancer is increased at least 1.5 times in siblings or offspring of patients with stomach cancer.

- **Hereditary diffuse gastric cancer**
  - Early onset, highly penetrant, diffuse gastric carcinoma
  - Linked to germline mutations in E-cadherin
  - Spans multiple generations
Intestinal (expanding) type

- distinct glands that are comprised of well-differentiated columnar epithelial cells with a well-developed brush border.

- morphologic appearance is similar to that of intestinal carcinomas, hence the term "intestinal type".

- Intestinal type is seen in 70% of gastric cancer.
Lauren Classification

- **Diffuse (infiltrative) type**
  - Infiltrating tumor cells with eccentric nuclei and large globules of intracytoplasmic mucin (signet ring cells)
  - diffusely infiltrating growth pattern
  - no distinct glandular formations

Arch Pathol Lab Med. 2004;128:765–770
Histological cascade for carcinogenesis of gastric cancer

H. pylori

Chronic Superficial Gastritis

Chronic Atrophic Gastritis

Intestinal Metaplasia

Dysplasia

Intestinal type Adenocarcinoma
Non-cardia

Diffuse type Adenocarcinoma
Non-cardia

Diffuse type Adenocarcinoma
Cardia

Intestinal type Adenocarcinoma
Cardia

Gastro-oesophageal Reflux

Reflux Oesophagitis

Intestinal Metaplasia

Dysplasia
Symptoms

Presenting symptoms of gastric cancer in 18,363 patients

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Percent</th>
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<tr>
<td>Weight loss</td>
<td>62</td>
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<tr>
<td>Abdominal pain</td>
<td>52</td>
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<tr>
<td>Nausea</td>
<td>34</td>
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<tr>
<td>Dysphagia</td>
<td>26</td>
</tr>
<tr>
<td>Melena</td>
<td>20</td>
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<tr>
<td>Early satiety</td>
<td>18</td>
</tr>
<tr>
<td>Ulcer-type pain</td>
<td>17</td>
</tr>
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</table>

Physical findings

Hepatomegaly may indicate liver metastasis.

Gastric mass may be palpable.
Physical findings

left supraclavicular adenopathy (Virchow's node)
Physical findings

Periumbilical nodule (Sister Mary Joseph's node)
And Ascites
enlarged ovary (Krukenberg's tumor)
Endoscopy

Gastric Cancer (2009) 12: 219–224
Endoscopy

Gastric Cancer (2009) 12: 219–224
NBI- Light blue crest sign

NBI- Clearly demarcated lesion with irregular microvascular pattern (IMVP)

Gastrointest Endosc 2010;71:477-84.
Confocal endomicroscopy

Gastric intestinal metaplasia

Endoscopy 2008; 40: 547 - 553
Confocal endomicroscopy

Gastric cancer

Kiesslich. Mini-Atlas of Confocal Laser Endomicroscopy
### TNM staging for gastric cancer

#### Primary tumor (T)
- **T0**: No evidence of primary tumor
- **Tis**: Carcinoma in situ: intraepithelial tumor without invasion of the lamina propria
- **T1**: Tumor invades lamina propria, muscularis mucosa, or submucosa
- **T1a**: Tumor invades lamina propria or muscularis mucosa
- **T1b**: Tumor invades submucosa
- **T2**: Tumor invades muscularis propria
- **T3**: Tumor penetrates subserosal connective tissue without invasion of visceral peritoneum or adjacent structures
- **T4**: Tumor invades serosa (visceral peritoneum) or adjacent structures
- **T4a**: Tumor invades serosa (visceral peritoneum)
- **T4b**: Tumor invades adjacent structures

#### Regional lymph nodes (N)
- **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 7-15 regional lymph nodes
- **N3a**: Metastasis in 7-15 regional lymph nodes
- **N3b**: Metastasis in 16 or more regional lymph nodes

#### Distant metastasis (M)
- **M0**: No distant metastasis
- **M1**: Distant metastasis

#### Anatomic stage/prognostic groups

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<th>T</th>
<th>N</th>
<th>M</th>
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<td>IIA</td>
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<td>IIIB</td>
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<td>T4a</td>
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<tr>
<td>IV</td>
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<td>Any N</td>
<td>M1</td>
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Treatment

- Discussed at multidisciplinary tumor board
- EMR/ESD
- Gastrectomy
- Chemo/radiotherapy
- Palliation
Prognosis

Observed survival rates for 10,601 surgically resected gastric adenocarcinomas

Data from the SEER 1973-2005 Public Use File diagnosed in years 1991-2000. Stage IA includes 1194; Stage IB, 655; Stage IIA, 1161; Stage IIB, 1195; Stage IIIA, 1031; Stage IIIB, 1660; Stage IIIC, 1053; and stage IV, 6148.

Used with the permission of the American Joint Committee on Cancer (AJCC), Chicago, Illinois. The original source for this material is the AJCC Cancer Staging Manual, Seventh Edition (2010) published by Springer New York, Inc.
Conclusions

- Gastric cancer incidence is decreasing, but it is still an important cause of mortality.
- There are various endoscopic modalities to aid in the diagnosis of early gastric cancer.
- Management of gastric cancer involves multidisciplinary approach.
Thank You