

**Guidelines for Cancer Imaging**  
**Oesophageal and Gastric Cancers**

Reviewed by Imaging CCG June 2012

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## **Oesophageal Cancer**

(including oesophagogastric junction tumours)

### **Comment**

A tumour, the epicentre of which is within 5 cm of the oesophagogastric junction (OGJ) and also extends into the oesophagus is classified and staged according to the Oesophageal scheme.

All other tumours with an epicentre in the stomach greater than 5 cm from the OGJ or those within 5 cm of the OGJ without extension into the OGJ or oesophagus are staged using the Gastric scheme.

### **Diagnosis**

The majority of oesophageal cancers are diagnosed on endoscopy. In the presence of an endoscopically malignant or highly suspicious lesion, staging investigations should be instigated without waiting for histological confirmation.

### **Staging**

Modality: CT

Body area: Thorax (including supraclavicular region) abdomen and pelvis

IV contrast medium: Yes - liver in portal venous phase

Oral contrast medium: Yes - negative

### **Protocol:**

A unified upper GI CT protocol for both oesophageal and gastric cancer is suggested, as many of these cancers are junctional. This is as follows:

#### **Patient preparation -**

- Fast for 4-6 hours before scan.
- 1 litre oral water in total (~200ml immediately before scan) - may be limited by dysphagia.
- Optional CO<sub>2</sub> granules or carbonated water – to improve gastric distension.
- Antiperistaltic agents (IV hyoscine) not required.

#### **Scan technique -**

- Supraclavicular fossa to inferior border of liver in arterial/mucosal phase (from external auditory meatus for cervical oesophageal tumour).
- Dome of diaphragm to symphysis pubis in portal venous phase.
- Optional: supraclavicular fossa to symphysis pubis in portal venous phase only.

## **Reporting of Staging CT**

Primary tumour

### **UICC TNM Classification**

Cervical oesophagus – lower border of cricoid to sternal notch

Upper thoracic oesophagus – sternal notch to carina

Mid-thoracic – upper half of oesophagus between carina and OGJ

Lower thoracic - lower half of oesophagus between carina and OGJ

OGJ tumours- See comment above

## **AJCC Classification**

Cervical oesophagus – upper oesophageal sphincter to sternal notch

Upper thoracic oesophagus – sternal notch to lower border of azygos vein

Mid-thoracic – lower border of azygos vein to inferior pulmonary veins

Lower thoracic - inferior pulmonary veins to OGJ

OGJ tumours- See comment above

## **TNM Classification of Malignant Tumours Seventh Edition**

### **T - Primary tumour:**

T1 lamina propria or submucosa

T1a lamina propria or muscularis mucosae

T1b submucosa

T2 muscularis propria

T3 invades adventitia

T4 invades adjacent structures

T4a (e.g. pleura, pericardium, diaphragm or adjacent peritoneum)

T4b (e.g. aorta, trachea, bronchi, vertebra)

### **N – Regional Lymph Nodes:**

Regional lymph nodes, irrespective of the site of the primary tumour, are those in the oesophageal drainage area, including coeliac axis nodes and paraoesophageal nodes in the neck, but not supraclavicular lymph nodes, which are considered distant metastases.

N0 No regional lymph node metastasis

N1 1 to 2 regional lymph nodes

N2 3 to 6

N3 >6

### **M - Distant Metastasis:**

Including liver, peritoneum, omentum, lung, bone, non-regional nodes

M0 No distant metastasis

M1 Distant metastasis

State final TNM stage

Reporting template, please see page 8.

## **Siewert Classification**

For OGJ tumours, Siewert classification is used by surgeons to plan treatment.

The classification subdivides OGJ tumours into:

Type I - tumour centre lies 1–5 cm proximal to the junction

Type II - tumour centre lies 1 cm proximal and 1cm distal to the junction

Type III - tumour centre lies 1–5 cm distal to the junction.

## **Other Investigations**

**18F-FDG PET/CT** - indicated for staging/restaging of patients suitable for radical treatment as the majority of oesophageal carcinomas are FDG-avid. The technique is helpful for delineating the craniocaudal extent of disease as well as detecting involved nodes and occult metastases. Following treatment, PET CT can be used to evaluate suspected residual or recurrent disease when other imaging is negative or equivocal.

**Endoscopic Ultrasound** - recommended in oesophageal cancer if the CT and PET CT suggest the patient may be suitable for radical treatment. EUS is useful for T staging and locoregional lymph node characterisation. EUS is also useful for guided FNA cytology of potential nodal disease for more accurate nodal staging.

**Laparoscopy** is required in most subdiaphragmatic tumours to detect small peritoneal deposits which may not be seen by imaging, as well as assessing local spread for operability and sampling any peritoneal fluid for cytology.

**MRI** is useful for characterisation of indeterminate liver lesions detected on CT.

**MRI and isotope bone scan** are useful for characterisation of indeterminate bone lesions detected on CT.

**Bronchoscopy** is sometimes required to exclude invasion of trachea and bronchi.

**Endobronchial ultrasound**, in combination with guided FNA cytology is occasionally required for more accurate staging of mediastinal and hilar nodes.

## **Follow-up**

Repeat CT may be required for monitoring of disease response to chemotherapy and radiotherapy and after endoscopic treatment for cancer.

Routine post-surgical follow up CT not indicated.

CT is generally indicated when recurrence is suspected from clinical symptoms. Positive or negative oral contrast may be used.

## **Gastric Cancer**

### **Comment**

Tumours with an epicentre in the stomach greater than 5 cm from the OGJ or those within 5 cm of the OGJ without extension into the OGJ or oesophagus are staged using the Gastric scheme.

### **Diagnosis**

The majority of gastric cancers are diagnosed on endoscopy. In the presence of an endoscopically malignant or highly suspicious lesion, staging investigations should be instigated without waiting for histological confirmation.

## **Staging**

Modality: CT

Body area: Thorax (including supraclavicular region) abdomen and pelvis

IV contrast medium: Yes - liver in portal venous phase

Oral contrast medium: Yes - negative

## **Protocol**

A unified upper GI CT protocol for both oesophageal and gastric cancer is suggested, as many of these cancers are junctional.

### **Patient preparation -**

- Fast for 4-6 hours before scan.
- 1 litre oral water in total (~400ml immediately before scan).
- Optional CO<sub>2</sub> granules or carbonated water – to improve gastric distension.
- Optional antiperistaltic agents (IV hyoscine). Not generally required to optimise gastric distension, especially if CO<sub>2</sub> granules or carbonated water used.

### **Scan technique -**

- Supraclavicular fossa to inferior border of liver in arterial/mucosal phase.
- Dome of diaphragm to symphysis pubis in portal venous phase.
- Optional: supraclavicular fossa to symphysis pubis in portal venous phase only.

## **Reporting of Staging CT**

Primary tumour

Site – cardia, fundus, body, antrum, pylorus, incisura, lesser or greater curvature

Circumferential, eccentric thickening, polypoidal, ulcerating

Extent/diameter/size

Tumour thickness

Outer margin –smooth, irregular, nodular, extramural tongues of tumour

Presence of hiatus hernia, outflow obstruction, linitis plastica, perforation

## **TNM Classification of Malignant Tumours Seventh Edition**

T - Primary tumour:

T1 Lamina propria, submucosa

T1a Lamina propria or muscularis mucosae

T1b Submucosa

T2 Muscularis propria

T3 Subserosa

T4a Penetrates serosa

T4b Invades adjacent structures

**N – Regional lymph nodes:**

Including perigastric, left gastric, common hepatic, splenic, coeliac, hepatoduodenal.

- N1 1 to 2 nodes
- N2 3 to 6 nodes
- N3a 7 to 15 nodes
- N3b 16 or more

**M – Distant metastasis:**

Including liver, peritoneum, omentum, lung, bone, non-regional nodes (e.g. retropancreatic, mesenteric, para-aortic, periportal).

- M0 No distant metastasis
- M1 Distant metastasis

Other findings – e.g. ascites  
State final TNM stage

**Other Investigations**

**Endoscopic ultrasound** may be useful for local staging in selected early gastric cancers.

**Laparoscopy** is the most sensitive test for the detection of small peritoneal deposits, assessing local spread for operability and sampling any peritoneal fluid for cytology.

**<sup>18</sup>F-FDG PET/CT** is not currently advocated for gastric cancer staging due to the variable avidity of different cancer subtypes.

**MRI** is useful for characterisation of indeterminate liver lesions detected on CT.

**MRI and isotope bone scan** are useful for characterisation of indeterminate bone lesions detected on CT.

**Follow-up**

Repeat CT may be required for monitoring of disease response to chemotherapy and after endoscopic treatment for cancer.

Routine post-surgical follow up CT not indicated.

CT is generally indicated when recurrence is suspected from clinical symptoms. Positive or negative oral contrast may be used.

**Gastrointestinal Stromal Tumour (GIST) - Oesophagus and Stomach**

**Staging**

- Modality: CT
- Body area: Thorax, abdomen and pelvis

Protocols as above

**T – Primary tumour size:**

T1 < 2 cm  
T2 > 2-5 cm  
T3 >5-10 cm  
T4 >10 cm

**N – Regional Nodes:**

Nodal metastasis is uncommon

N0 No regional lymph node metastasis  
N1 Regional lymph node metastasis

**M – Distant metastasis:**

Including peritoneum, omentum, mesentery, liver, lung

M0 No distant metastasis  
M1 Distant metastasis

Stage grouping depends on TNM staging and mitotic rate  
Prognostic factors: site, size, mitotic rate

**Other Investigations**

<sup>18</sup>F-FDG PET/CT can be used for staging prior to treatment in patients who are likely to require systemic therapy, as well as for assessment of response to systemic therapy.

**References:**

- 1.UICC TNM Classification of Malignant Tumours, Seventh Edition
- 2.AJCC Cancer Staging Manual, Seventh Edition
- 3.Oesophagus and Stomach Cancers - Recommendations for cross-sectional imaging in cancer management, Second Edition. The Royal College of Radiologists, June 2014.
4. Evidence based indications for the use of PET-CT in the UK 2013.
5. Guidelines for management of oesophageal and gastric cancer, Gut 2011;60:1449-1472.

**OESOPHAGEAL CANCER STAGING CT REPORT TEMPLATE**

Primary Tumour: [circumferential/stenosing/eccentric/polypoidal]

Cranio-caudal length: [ ]

Tumour position: [cervical / upper, middle, lower thoracic/ GOJ]

Upper extent: [ ]

Lower extent: [ ]

Maximum tumour thickness: [ ] or diameter: [ ]

Outer margin: [smooth/irregular/nodular]

Oesophago-aortic interface: [convex/concave] Degree of involvement: [ ]

Other involved adjacent structures:

Regional lymph nodes: [Yes No]

Location [ ] Number [ ] Size [ ]

Non-regional lymph nodes: [Yes No]

Location [ ] Number [ ] Size [ ]

Liver metastases: [Yes No]

Segment [ ] Number [ ] Size [ ]

Peritoneal / omental deposits: [Yes No] Location [ ]

Ascites [Yes No]

Pulmonary Metastases: [Yes No]

Location [ ] Number [ ] Size [ ]

Bone metastases: [Yes No] Location [ ]

Other metastases:

Other findings: hiatus hernia, oesophageal obstruction, perforation, fistula, airway narrowing.

Impression:

- T[ ] N[ ] M[ ]

- Position [Cervical, Thoracic Upper Mid Lower, GOJ] [S1 S2 S3 ]

-Other significant findings: