GMCA GREATER MANCHESTER COMBINED AUTHORITY

NHS in Greater Manchester

Greater Manchester **Cancer**

Guidelines for Cancer Imaging

Oesophageal and Gastric Cancers

Reviewed by Imaging CCG June 2012

Reviewed by Manchester Cancer May 2015

Updated July 2019 by Dr Amanda Law, Dr Sue Liong

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Oesophageal Cancer

(Including gastro-oesophageal junctional tumours)

Comment (TNM eighth edition 2017)

A tumour, the epicentre of which is within 2 cm of the gastro-oesophageal junction (GOJ) and also extends into the oesophagus is classified and staged according to the Oesophageal scheme (Siewert types I/II).

All other tumours with an epicentre in the stomach greater than 2 cm from the GOJ or those within 2 cm of the GOJ without extension into the GOJ 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_2 granules or carbonated water – to improve gastric distension.
- Antiperistaltic agents (IV hyoscine) not required.

Scan technique -

- Supraclavicular fossa to symphysis pubis in portal venous phase (from external auditory meatus for cervical oesophageal tumour).

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 GOJ
Lower thoracic - lower half of oesophagus between carina and GOJ
GOJ 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 GOJ
GOJ tumours- See comment above

TNM Classification of Malignant Tumours
(No changes in the definitions of T, N and M with eighth edition 2017)

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, azygous vein 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 7 or more

M - Distant Metastasis:
Including liver, adrenals, peritoneum, omentum, lung, bone, non-regional nodes

M0 No distant metastasis
M1 Distant metastasis
Other findings – e.g. ascites
State final TNM stage
Reporting template, please see page 8.

Siewert Classification
For GOJ tumours, Siewert classification is used by surgeons to plan treatment.
The classification subdivides GOJ 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-Fluorodeoxyglucose (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. PET/CT has low accuracy for T and N staging. High FDG uptake in the primary oesophageal carcinomas can obscure uptake in the locoregional nodes and PET/CT has low sensitivity for small involved nodes. Following treatment, PET CT can be used to evaluate suspected residual or recurrent disease when other imaging is negative or equivocal.

Endoscopic Ultrasound (EUS) - recommended in oesophageal and GOJ tumours if there is no evidence of metastatic disease on CT and PET/CT and the patient may be suitable for radical treatment. Only offer EUS when it will help guide ongoing management. EUS uses a high frequency ultrasound transducer to provide detailed images of oesophageal and GOJ tumours and their relationship with the five-layered structure of the oesophageal wall. It is the most accurate technique for T staging and predicting resectability. EUS is also useful for locoregional

lymph node characterisation, including guided fine needle aspiration (FNA) cytology of potential nodal disease, and is the most accurate technique for N staging. However, EUS cannot traverse some stenotic tumours.

Laparoscopy is required in most subdiaphragmatic tumours to detect small peritoneal and omental deposits which may not be seen on imaging, as well as assessing local spread for operability and sampling any peritoneal fluid for cytology. It can also assess the liver surface.

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 and PET 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.
Barium or water soluble contrast swallow is sometimes performed when oesophageal stent is required for stenosing tumours.
Ultrasound can detect liver metastases but is less sensitive than CT or MRI. It is also of value in confirming benign cysts not characterised by CT. Ultrasound +/- FNA is sometimes helpful for assessing incidental abnormalities found on CT or PET/CT (e.g thyroid and salivary gland lesions and neck 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 (TNM eighth edition 2017)

Tumours with an epicentre in the stomach greater than 2 cm from the GOJ or those within 2 cm of the GOJ without extension into the GOJ 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_2 granules or carbonated water – to improve gastric distension.
- Optional antiperistaltic agents (IV hyoscine). Not generally required to optimise gastric distension, especially if CO_2 granules or carbonated water used.

Scan technique -

- 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

(No changes in the definitions of T, N and M with eighth edition 2017)

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 is superior to CT for the local staging of gastric carcinoma and may be useful in selected early gastric cancers. High frequency transducers can evaluate the subgroups of T1 and assess the suitability for endoscopic mucosal resection. T1 can be distinguished from T2 and may affect treatment decisions regarding preoperative chemotherapy.

Laparoscopy is the most sensitive test for the detection of small peritoneal and omental deposits, assessing local spread for operability and sampling any peritoneal fluid for cytology. It can also assess the surface of the liver.

18F-FDG PET/CT is not currently advocated for gastric cancer staging due to the variable avidity of different cancer subtypes. PET-CT may be useful in gastric cancer if CT is equivocal for metastatic disease, to guide ongoing management. PET-CT is indicated in GOJ tumours (see above).

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

18F-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.
Endoscopic ultrasound with FNA can help confirm diagnosis at presentation. EUS can be used for monitoring small lesions.
Percutaneous needle biopsy with ultrasound or CT guidance is occasionally required for histological diagnosis, when a gastric tumour is inaccessible to EUS FNA and primary resection is not appropriate. However, percutaneous biopsy carries a small risk of peritoneal seeding.

Follow-up

Contrast enhanced CT abdomen and pelvis is used for follow-up as most relapses affect the peritoneum and the liver.

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: