

Imaging and staging of oesophageal and pancreatic cancer

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Aim

1. Evidence base for the imaging modalities used for staging
2. Revise the staging
3. Imaging algorithms used at RMH

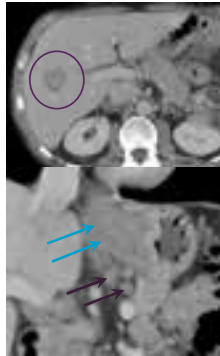


Oesophago-gastric cancer



Multi-Detector CT

- Cornerstone
- Accessible
- Identifies metastatic disease
- Assessment of local staging



Multi-Detector CT

- Improved spatial resolution allows for multi planar reformats
- Tumour assessment in orthogonal planes
- Perpendicular to adjacent structures



Multi-Detector CT

Staging Accuracy

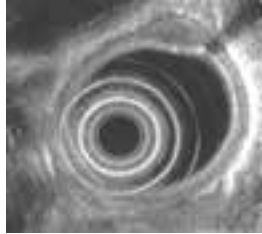
- Poor for early tumours
- Lack of soft tissue contrast
- T stage - based on wall thickness and outline

T Stage	Wall thickness	Wall Contour
T2	>3mm, <5mm	Smooth
T3	5-15mm	Irregular
T4	>15mm	Contact with adjacent structure



Endoscopic Ultrasound staging for early oesophageal tumours

- able to delineate the layers of the oesophageal wall
- more accurate staging of tumours confined within the wall (<T3)

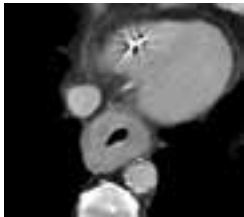


pT1 tumour

Courtesy of Martin Benson

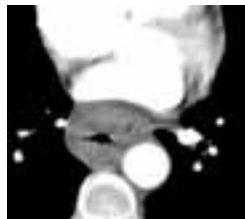


Is it Resectable???



T3

Vs



T4



Lymph node assessment with MDCT

- Lymphatic drainage varies dependent on primary site
- Involvement on CT - based on size criteria
 - ≥10mm mediastinum
 - 5mm-10mm LGA territory, peri-gastric



CT assessment lymph nodes:
High specificity, low sensitivity.



Multi-Detector CT

Staging Accuracies

	T Stage	N Stage
Oesophageal Cancer	74%*	68%*
Gastric Cancer	77% [†]	67% [†]



* Davies, A. R., D. A. Deans, et al. (2006). *Dis Esophagus* **19**(6): 496-503
[†]Hur, J., M. S. Park, et al. (2006). *J Comput Assist Tomogr* **30**(3): 372-7.

EUS - Nodal assessment

- Morphological appearance & size
- Malignant nodes: Round, hypo-echoic
- Capability for FNA using linear array probe



Meta-analysis*:

EUS Sens 80%, Spec 70%

CT Sens 50%, Spec 83%



*van Vliet, E. P., M. H. Heijnenbroek-Kal, et al. (2008). *Br J Cancer* **98**(3): 547-57.

1. When is PET-CT relevant in Oesophago-gastric cancer?

1. Useful to stage the primary tumour
2. Useful to stage the regional lymph nodes
3. Useful to identify occult metastatic disease
4. Should be used for all oesophago-gastric patients who are suitable for surgical resection



¹⁸F-FDG-PET/CT - Oesophageal Cancer

Detection of occult metastases

Initial studies using FDG PET:

- Metastatic disease detected in 15% patients considered potentially operable*.
- Prospective trial 187 patients showed confirmed up-staging in 9(4.8%) patients & 18 (9.5%) patients with unconfirmed metastases[†]

Delineation of craniocaudal extent of tumour[‡]

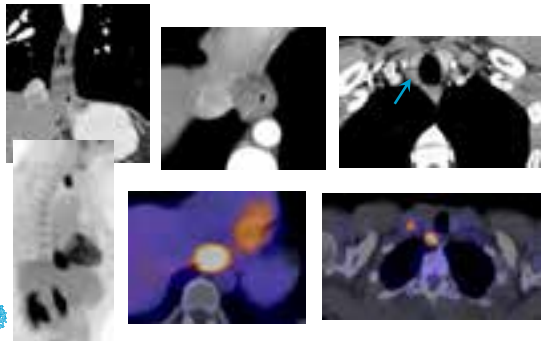


*Flamen, P., A. Lerut, et al. (2000). *J Clin Oncol* 18(18): 3202-10.

†Meyers, B. F., R. J. Downey, et al. (2007). *J Thorac Cardiovasc Surg* 133(3): 738-45

‡Mamede, M., G. El Fakhr, et al. (2007). *Ann Nucl Med* 21(10): 553-62.

Occult Supraclavicular lymph nodes, detected on ¹⁸F-FDG-PET/CT

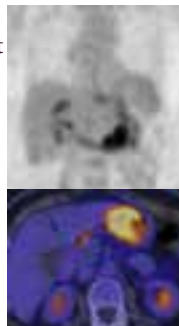


¹⁸F-FDG-PET/CT - Gastric Cancer

Variable ¹⁸F-FDG avidity dependent upon tumour subtype

- Intestinal-type have greater FDG avidity
 - Limited uptake in diffuse-type
- ~30% tumours not visualised

¹⁸F-FDG-PET/CT not currently advocated for gastric cancer staging



Current RMH Oesophago-gastric Cancer Staging Algorithm

Oesophageal Cancer

Initial staging MDCT

MDT Discussion

For radical surgery or Chemo/Radiotherapy:

EUS & ¹⁸F-FDG-PET/CT

Laparoscopy if sub-diaphragmatic disease

Gastric Cancer

Initial staging MDCT

MDT Discussion

EUS in selected cases

Laparoscopy