Re-audit of gastrointestinal tract specimens with respect to compliance with RCPath guidelines

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Background – epidemiology and aetiology

Over the past 20 years there has been an annual increase in adenocarcinoma of the gastro oesophageal junction (GOJ). The peak age group is between 50 and 60 years, with a male to female ratio of 2:1. There have been parallel increases in adenocarcinoma of the gastric cardia, which now accounts for 50% of all gastric cancers. Despite the rise in gastric cardia tumours, the incidence of gastric cancer is declining, with rates 11% lower in 2000 compared with 1990, due mainly to a decrease in distal gastric tumours.[1,2]

Of the aetiological factors, chronic gastro oesophageal reflux disease (GORD) is now well established as a cause, mainly due to the increased risk related to Barrett's metaplasia. Obesity predisposes to hiatus hernia and reflux, and hence contributes mechanically to an increased risk. The hypochlorhydria caused by *Helicobacter pylori*, resulting in ammonia production of urea by the bacteria protects the lower oesophagus by changing the pH content of the refluxing gastric contents. Eradicating *H. pylori* infection in the treatment of ulcer and non-ulcer dyspepsia may be inadvertently contributing to the increase in GOJ cancers. Tobacco and alcohol are also contributing factors.

Original audit

The original audit was conducted in 2014. It was a retrospective study and included 48 patients who had oesophagogastrectomy or gastrectomy surgery between January and September 2014 at Broomfield Hospital, Mid Essex Hospital Services NHS Trust (MEHT). The cases diagnosed as gastrointestinal stromal tumours (GIST) were excluded. The original audit concluded and recommended the following:

- use correct TNM nomenclature i.e. 'y' prefix
- introduce the use of microscopy proformas for reporting
- mandard grading (in post neoadjuvant cases).

Aims and objectives

The re-audit aims to evaluate the implementation of the recommendations from the initial audit. The re-audit is a retrospective analysis of the upper gastrointestinal (GI) resection specimen reports in relation to macroscopic and microscopic dataset items as recommended by the Royal College of Pathologists (RCPath),[3,4] with relation to:

- analysis of the correct use of TNM classification ("y")
- assessing the use of the departmental GI proforma (for microscopic data items) introduced after the initial audit (2014)
- analysis of the Mandard grading; including the provision by clinicians of correct clinical details with respect to recording the use of neoadjuvent chemotherapy (NACT).

Standards

The RCPath and the British Society of Gastroenterology (BSG)[5] strongly advocate the standardisation of reporting guidelines for all gastrointestinal malignancies.

For pathologists, the RCPath recommends the use of datasets, outlining the core and non-core items that provide both the patient and clinician with prognostic information, information for the most appropriate management and facilitates audit of diagnostic and therapeutic interventions.

Dataset for the histopathological reporting of gastric carcinoma[3]

Core data items

Macroscopic	Microscopic
Tumour site	Histological type

Macroscopic cont.	Microscopic cont.
Tumour size	Histological differentiation
Tumour morphology	Resection margins (distal/proximal/circumferential)
	Lymph node status (The dataset states that a minimum of 15 lymph nodes should be harvested.)
	TNM - Extent of tumour through wall
	Lymphovascular/ perineural invasion

Non-core data items

Macroscopic	Microscopic
Specimen dimensions	Effects of neo-adjuvant chemotherapy
	Glandular atrophy
	Intestinal metaplasia
	Dysplasia
	Presence of *H. pylori*

Dataset for the histopathological reporting of oesophageal carcinoma[4]

Core data items

Macroscopic	Microscopic
Maximum tumour diameter	Histological type
Tumour site/location	Tumour differentiation
Maximum depth of invasion	Serosal involvement
Morphology	Vascular invasion
	Lymph node status
	Resection margins (PRM/DRM/CRM)

Non-core data items

Macroscopic	Microscopic
Overall dimensions of specimen	Effects of neoadjuvant therapy
	Presence of Barrett's metaplasia
	Molecular data

Lymph node status
Gastric carcinoma dataset
The dataset states: "Ideally at least 15 nodes should be recovered from a gastric cancer resection specimen, but the possible yield will depend upon the type of surgical resection performed." Every effort is made to do this and a further harvest is sought if the number falls short during the initial search.

Oesophagus carcinoma dataset
The dataset does not state the number of lymph nodes that should be harvested from the specimen. As a compromise and taking the gastric dataset into consideration, Broomfield Histopathology Department makes the effort to harvest at least 15 lymph nodes from each specimen.

TNM staging
Criteria used in the 7th edition of the American Joint Committee on Cancer (AJCC) edition of staging tumours:
- GOJ tumours – a tumour, the epicenter of which is within 5 cm of the GOJ and also extends into the oesophagus, is classified and staged according to the oesophageal scheme
- A tumour, with an epicenter in the stomach greater than 5 cm from the GOJ or those within 5 cm of the GOJ without extension into the oesophagus, are staged using the gastric scheme.
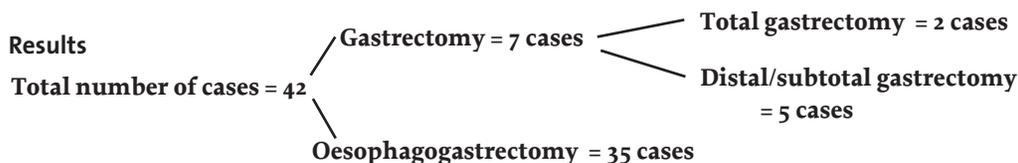
- The *Dataset for the histopathological reporting of gastric carcinoma (2nd edition)* advises:
    - TNM 7th: pT staging
    - TNM 5th: pN staging.

  Furthermore, any tumour nodule >3 mm in the connective tissue of a lymph drainage area, without histologic evidence of a residual lymph node, is classified as node metastasis.

Method

The cases were identified from a computerised SNOMED search via the Winpath system and anonymised. This retrospective re-audit included 42 patients who had oesophagogastrectomy or gastrectomy surgery between August 2015 and March 2016 at Broomfield Hospital, MEHT. The cases diagnosed as GIST were excluded. Of the 42 cases, 35 were oesophagogastrectomies and 7 were gastrectomies (total, sub-total or distal).

All the core data items were extracted from the reports, for both types of specimens. Special note was made about the provision of information regarding neo-adjuvant therapy by the clinicians.

Results

Total number of cases = 42

Gastrectomy = 7 cases
- **Total gastrectomy = 2 cases**
- **Distal/subtotal gastrectomy = 5 cases**

Oesophagogastrectomy = 35 cases

Gastrectomy specimens
Core data items

Macroscopic	Number of cases (%)	Further information (provided in reports)
Specimen dimensions	100% (7/7)	Provided in three dimensions
Site of tumour	57% (4/7)	Distal area/distal margin/lesser curve
Tumour dimensions	86% (6/7)	Provided in two dimensions

Non-core data items

Macroscopic	Number of cases (%)	Further information (provided in reports)
Tumour morphology	100% (7/7)	Ulcerated/nodular/thickened
Distance to nearest margin	86% (6/7)	Not provided in 1 case
Type of tumour	100% (7/7)	Adenocarcinoma
Lauren's classification	100% (7/7)	Diffuse (4/7), Intestinal (1/7), Mixed (2/7)
Lymphovascular invasion	100% (7/7)	Present (6/7), Absent (1/7)
CRM clearance	100% (7/7)	Clear (2/7), Involved (1/7), Not applicable (4/7)
Longitudinal margin clearance	100% (7/7)	Clear (5/7), PRM involved (1/7), DRM involved (1/7)
TNM classification	100% (7/7)	Correctly stated in all cases
Nodal yield	100% (7/7)	Total node range 9–43. Involved node range 2–17

NACT: Recorded by clinicians in 20/35 cases
Mandard tumour regression grade given 19/20 cases
"y" prefix provided in 16/20 cases

Oesophagogastrectomy specimens
Core data items

Macroscopic	Number of cases (%)	Further information (provided in reports)
Specimen dimensions	100% (35/35)	Provided in three dimensions
Site of tumour	100% (35/35)	GOJ, distal, proximal oesophagus, stomach
Tumour dimensions	100% (35/35)	Provided in two dimensions
Tumour morphology	88% (31/35)	Ulcerated/nodular/thickened/polypoidal
Tumour to longitudinal margin	88% (31/35)	Not stated in 4/35

Non-core data items

Macroscopic	Number of cases (%)	Further information (provided in reports)
Tumour type	100% (35/35)	Adenocarcinoma 32/35, no lesion seen 3/35
Lauren's classification	100% (35/35)	Where applicable
Tumour differentiation	88% (31/35)	1/35 NACT given but tumour not graded 3/35 tumour not seen microscopically
Lymphovascular invasion	91% (32/35)	In 3/35 cases tumour not seen, hence not applicable
CRM clearance	91% (32/35)	In 3/35 cases tumour not seen, hence not applicable
Longitudinal margin clearance	100% (35/35)	Clear 31/35, DRM involved 1/35, No tumour in 3/35 cases, hence not applicable
TNM classification	100% (35/35)	Provided in all cases
Nodal yield	100% (35/35)	Total node range 7–58. Involved node range 1–27

NACT: Recorded by clinicians in 20/35 cases

Mandard tumour regression grade given 19/20 cases
"y" prefix provided in 16/20 cases

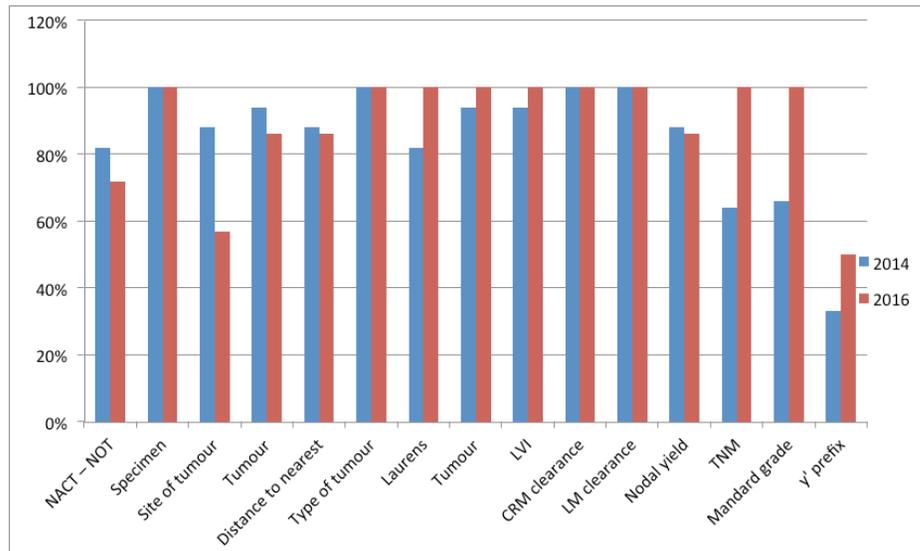**Comparison of audit vs re-audit (gastrectomies)**
Macroscopy

	Audit (2014)	Re-audit (2016)
Number of cases	17	7
NACT information – not provided	82% (14/17)	72% (5/7)
Specimen dimensions	100% (17/17)	100% (7/7)
Site of tumour	88% (15/17)	57% (4/7)
Tumour dimensions	94% (16/17)	86% (6/7)
Distance to nearest margins	88% (15/17)	86% (6/7)

Microscopy

	Audit (2014)	Re-audit (2016)
Type of tumour	100% (17/17)	100% (7/7)
Lauren's classification	82% (14/17)	100% (7/7)
Tumour differentiation	94% (16/17)	100% (7/7)
LVI	94% (16/17)	100% (7/7)
CRM clearance	100% (17/17)	100% (7/7)
Longitudinal margin clearance	100% (17/17)	100% (7/7)
Nodal yield (15 or more nodes)	88% (15/17) Total range 11–40 Involved nodes 1–13	86% (6/7) Total range 9–43 Involved nodes 2–17
TNM	88% (15/17)	100% (7/7)

Graph 1: comparison of audit vs re-audit (gastrectomies) – microscopy


Comparison of audit vs re-audit (oesophagogastrectomies)

Macroscopy

	Audit (2014)	Re-audit (2016)
Total number of cases	31	35
NACT information – not provided	70% (22/31)	29% (10/35)
Specimen dimension	100% (31/31)	100% (35/35)
Site of tumour	52% (16/31)	100% (35/35)
Tumour dimension	100% (31/31)	86% (6/7)
Distance to nearest margin	90% (28/31)	89% (31/35)

Microscopy

	Audit (2014)	Re-audit (2016)
Type of tumour	100% (31/31)	100% (35/35)
Tumour differentiation	90% (28/31)	100% (35/35)
LVI	90% (28/31)	100% (35/35)
CRM clearance	93% (29/31)	100% (35/35)
Longitudinal margin clearance	96% (30/31)	100% (35/35)
Nodal yield	94% (29/31) Total range 10–46 Involved nodes 1–19	86% (30/35) Total range 7–58 Involved nodes 1–27
TNM	100% (31/31) (Incorrect TNM in 5/31; 4 cases - pT2a/2b to pT3; 1 cases pN1 to pN2)	100% (35/35)
Mandard grade	66% (6 of the 9 cases which had received neo-adjuvant treatment)	95% (19 of the 20 cases which had received neo-adjuvant treatment)
'y' prefix	11% (1 of the 9 cases which had received neo-adjuvant treatment)	80% (16 of the 20 cases which had received neo-adjuvant treatment)

Graph 2: comparison of audit vs re-audit (oesophagogastrecto-mies) – microscopy
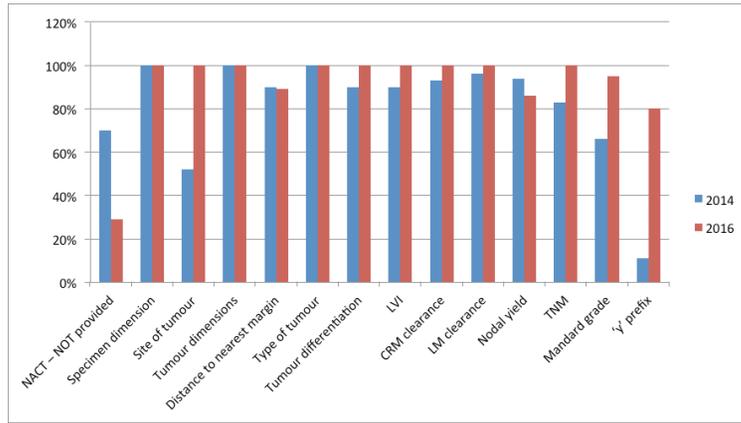
Conclusion
Gastrectomy specimens
The results show that the microscopic core data item results have improved. However, some of the macroscopic core data item results have not been recorded in some reports. These include:

- tumour site, dimensions, and distance to nearest margin
- oesophagogastrectomy specimens
- again, the microscopic core data items have improved. The only macroscopic core data item not recorded in some reports is the distance to the nearest margin.

The lymph node yield is slightly decreased for both types of specimens.

Recommendations

- Remind clinical colleagues to provide NACT information.
- Continue to use correct TNM classification ("y" prefix in appropriate cases).
- Continue to use Mandard grading (in appropriate cases).
- Continue to use proformas for microscopy (as recommended in the initial audit of 2014).
- Consider and discuss the introduction of a template for the macroscopic core data items.

Proposed template for macroscopic examination of gastric carcinoma

Template for Gastric Cancer Macroscopic Examination
Name: DOB: Histology Number:
Type of specimen:
Specimen dimensions:
Tumour location/site:
Maximum tumour size:
Morphology of tumour:
Distance of tumour from PRM:
Distance of tumour from DRM:

Proposed template for macroscopic examination of oesophageal carcinoma

Template for Oesophageal Cancer Macroscopic Examination
Name: DOB: Histology Number:
Type of specimen:
Specimen dimensions:
Tumour location/site:
Maximum tumour size:
Morphology of tumour:
Maximum anatomical depth of tumour
Distance of tumour from CRM:
Distance of tumour from PRM:
Distance of tumour from DRM:
Extended resection (Oesophageal adventitia/crura of diaphragm): YES/NO

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