

arising through the same pathway and predisposing to adenocarcinoma development at this site. The influence of obesity on the aetiology of cardia mucosa is unknown.

Methods 62 *H pylori* negative healthy volunteers (age 18–74 years) were recruited. BMI, waist circumference and gender were recorded. MRI (Phillips 1.5T) was performed for quantification of visceral and subcutaneous fat (average of three axial planes; L2, L3 and L4). Upper GI endoscopy was performed with biopsies of the gastro-oesophageal junction. Biopsies were taken in a craniocaudal direction and targeted to include enough squamous mucosa to confirm position. Intra-procedure pathological feedback was available and two to three biopsies were taken to optimise accuracy. Junctional biopsies were assessed to determine cardia length, considered measurable provided there was consecutive squamous, cardia and oxyntic mucosal types present. Non-parametric correlations were examined between BMI, waist circumference and cardia length and between fat distribution quantified by MRI and cardia length. Regression analysis (Stepwise method) incorporating age, BMI, waist circumference and MRI total fat was used to determine predictors of cardia length.

Results 37 of 62 volunteers had at least one junctional biopsy including squamous, cardia and oxyntic mucosa; median total length 6.5 mm (IQR 1.6). Median cardia mucosal length was 2.5 mm (IQR 1.5 mm). Length of cardia mucosa increased with age ($R=0.457$, $p=0.004$) and with waist circumference ($R=0.466$, $p=0.004$). A correlation was also seen with intra-abdominal fat ($R=0.374$, $p=0.027$) and total fat measured by MRI ($R=0.389$, $p=0.021$) but not with subcutaneous fat ($p=0.091$). There was no significant correlation with BMI. On regression analysis the independent predictors of cardia mucosa length were waist circumference (Standardised coefficient 0.342, $p=0.035$) and age (Standardised coefficient 0.322, $p=0.046$). Intestinal metaplasia at the cardia was seen in only 4 of 62 volunteers.

Conclusion These findings suggest that cardia mucosa may be acquired with increasing age through a process of distal squamous columnar metaplasia accelerated by central obesity. A possible mechanism is opening of the distal portion of the lower oesophageal sphincter and short segment acid reflux.

Competing interests None declared.

PTU-177 REDUCTION IN LENGTH OF STAY FOR PATIENTS UNDERGOING MAJOR UPPER GASTROINTESTINAL RESECTIONS WITH IMPLEMENTATION OF ENHANCED RECOVERY PACKAGES

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Introduction The high mortality and morbidity associated with resection for gastro-oesophageal malignancy has resulted in a conservative approach to the post-operative management of this patient group. In August 2009 an Enhanced Recovery After Surgery (ERAS) pathway tailored for patients undergoing resection for gastro-oesophageal malignancy was introduced. We aimed to assess the impact of this change in practice on standard clinical outcomes.

Methods We performed a retrospective review of two cohorts of patients undergoing resection for gastro-oesophageal malignancy before (08/08–07/09) and after (08/09–07/10) the implementation of the ERAS pathway. Data were collected on demographics, interventions, length of stay, morbidity and in hospital mortality.

Results There were 53 and 55 gastro-oesophageal resections undertaken in each year for malignant disease. The median length of stay

for both gastric and oesophageal resection decreased from 15 to 11 days ($p<0.001$) following the implementation of the ERAS pathway. There was no increase in morbidity (gastric resection 23.1% vs 5.3% and oesophageal resection 25.9% vs 16.7%) or mortality (gastric resection no deaths and oesophageal resection 1.8% vs 3.6%) associated with the changes. There was a significant decrease in the number of oral contrast studies used following oesophageal resection with a reduction from 21 (77.8%) in 2008–2009 to 6 (16.7%) in 2009–2010 (χ^2 , $p<0.0001$).

Conclusion The introduction of an enhanced recovery programme following gastro-oesophageal surgery resulted in a significant decrease in length of median patient stay in hospital without a significant increase in associated morbidity and mortality.

Competing interests None declared.

PTU-178 MEASUREMENT OF ESOPHAGO-GASTRIC JUNCTION CROSS-SECTIONAL AREA AND DISTENSIBILITY BY ENDOFLIP® (ENDOLUMENAL FUNCTIONAL LUMEN IMAGING PROBE) FOR THE DIAGNOSIS OF PATIENTS WITH GASTRO-ESOPHAGEAL REFLUX DISEASE (GERD)

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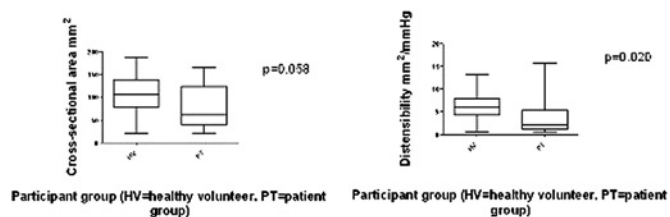
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Introduction EndoFLIP® (Crospon, Ireland) is an innovative device designed to assess the cross sectional area (CSA) and distensibility of the esophagogastric junction (EGJ) by combined impedance planimetry and pressure measurement. Initial studies have suggested that this probe may distinguish between gastro-oesophageal reflux disease (GERD) patients and healthy volunteers (HV).

Aim To assess the diagnostic agreement of EndoFLIP® measurements with clinical and physiologic GERD diagnosis.

Methods 22 healthy volunteers, (HV; female=16, age 21–46, mean body mass index (BMI) 24.3 kg/m²) and 20 patients with GERD symptoms (female=14, age 19–78, mean BMI 33.2 kg/m²) were studied. Patients were older ($p<0.0001$) and had greater BMI ($p=0.001$). Median EGJ CSA and distensibility at 20 ml and 30 ml EndoFLIP® balloon volume were measured. A Bravo capsule (Given Imaging, Israel) was attached 6 cm above the Z-line and a 48 h wireless esophageal pH recording acquired. The ability of EndoFLIP® measurements to discriminate (1) patient group and (2) individuals with pathologic acid exposure ($>5.6\%$ time $<pH4$) was calculated.

Results Complete measurements were acquired except in one patient with early detachment of Bravo capsule. Distensibility could not be measured in one patient and one volunteer with negative endoFLIP® balloon pressures. 7/22 (32%) HVs and 7/19 (37%) of patients had oesophagitis (six patients with hiatus hernia). 3/22 (14%) HVs and 9/19 (47%) patients had pathologic acid exposure ($p=0.126$). EGJ CSA was higher in healthy volunteers than the patient group, at 20 ml ($p=0.018$) and 30 ml ($p=0.058$, Abstract PTU-178 figure 1) endoFLIP® balloon volume. EGJ distensibility was lower in patients than HVs at 20 ml ($p=0.001$) and 30 ml balloon volume, ($p=0.020$, Abstract PTU-178 figure 1). EndoFLIP® measurements were similar in participants with and without pathologic acid exposure (median CSA 40 mm² vs 34 mm² $p=1.0$ at 20 ml, 98 mm² vs 107 mm², $p=0.789$ at 30 ml) and distensibility at 20 ml ($p=0.574$) and 30 ml balloon volume ($p=0.704$). Post-hoc analysis revealed an inverse association between BMI and CSA ($R^2=0.214$, $p=0.003$) and negative association with distensibility ($R^2=0.211$, $p=0.003$). BMI was associated also with a trend to increased acid exposure ($p=0.116$).



Abstract PTU-178 Figure 1 Cross-sectional area and distensibility at 30 ml EndoFLIP balloon volume in healthy volunteer and patient groups.

Conclusion EndoFLIP® is not useful for GERD diagnosis as EGJ CSA and distensibility do not distinguish between HVs and GERD patients defined by clinical presentation or pH measurement. This unexpected result may be due to an important interaction of obesity with EndoFLIP® measurements.

Competing interests None declared.

PTU-179 ACETOWHITENING AS A NOVEL DIAGNOSTIC TOOL FOR THE DIAGNOSIS AND CHARACTERISATION OF NEOPLASIA WITHIN BARRETT'S OESOPHAGUS

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Introduction The identification of Barrett's neoplasia using acetic acid has relied upon the examination of surface patterns, which involves subjective judgement. When sprayed onto Barrett's tissue acetic acid causes an acetowhitening reaction. We have observed that neoplastic tissue loses this whitening more quickly than non-neoplastic Barrett's. This study aims to quantify the acetowhitening time and develop an objective tool for the diagnosis of Barrett's neoplasia.

Methods Patients referred for suspected Barrett's neoplasia and for routine Barrett's surveillance were assessed. A 50 ml mucolytic drink of 10% N-acetyl cysteine and 5 ml of simethicone was taken prior to the procedure. Fujinon gastroscopes with EPX 4400 processor were used. 20 ml of 2.5% acetic acid was applied to the Barrett's mucosa via a spray catheter. Timing was recorded with a stopwatch and started after the oesophagus had been coated with acetic acid and the excess dye sucked away. Disappearance of the acetowhitening was defined as the appearance of erythema within the Barrett's epithelium. After a maximum of 5 min the Barrett's epithelium was washed using 20 ml of water and targeted biopsies of any neoplasia and quadrantic 2 cm biopsies of the residual Barrett's was taken. The histology was correlated to the acetowhitening disappearance time. ROC curves were produced to identify threshold timings for optimum sensitivity and specificity for high risk neoplasia and invasive cancer within Barrett's.

Results Data from 146 areas of Barrett's was collected from 121 patients. 84% were male. Mean age 69. 72/86 metaplasia, 6/14 LGD, 26/27 HGD, 15/15 IMC and 12/12 areas of invasive cancer were recognised correctly by the endoscopist. A ROC curve was produced for the identification of high risk neoplasia (HGD, IMC and invasive cancer) using the acetowhitening timings. The area under the curve was 0.93 (95% CI 0.89 to 0.97), with an asymptomatic significance of $p=0.000$. Using a threshold of 142 s a sensitivity for neoplasia of 98% (95% CI 89% to 100%) and specificity of 84% (95% CI 74% to 91%) was achieved. A further ROC curve was produced for HGD + IMC vs invasive cancer. The area under the curve was 0.786 (61 to 96). Using a cut off of 20 s, a sensitivity for invasive cancer of 67% (95% CI 35% to 90%) and specificity of 85% (95% CI 69% to 95%) could be achieved.

Conclusion The acetowhitening reaction can be exploited for the diagnosis of neoplasia within Barrett's. This provides the endoscopist with an objective and simple numerical tool for predicting whether an area is neoplastic, and to predict the presence of sub-mucosally invasive disease. This has important implications for the treatment of neoplasia within Barrett's, and could prevent inappropriate attempts at endoscopic resection of invasive cancer.

Competing interests None declared.

PTU-180 WHAT IS THE ROLE OF EUS IN NODAL STAGING OF OESOPHAGEAL CANCER IN THE ERA OF PET-CT?

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Introduction EUS+/-FNA has been regarded as a standard investigation for T and N staging of oesophageal and oesophagogastric junctional (OGJ) cancer. The increased availability of PET-CT has led to many centres reducing their use of EUS and relying more on non-invasive assessment of lymph node involvement. The aim of this study was to retrospectively analyse the outcomes from EUS following the introduction of PET-CT into a single regional unit.

Methods The computerised records of all patients diagnosed with oesophageal or OGJ cancer and discussed at a regional MDM between March 2009 and February 2011 were analysed. Patients felt to be suitable for radical treatment based upon initial endoscopy, CT scan and review of referral letter underwent a combination of PET-CT +/- EUS. The final staging pathway and management of this group of patients were analysed retrospectively.

Results 593 patients were diagnosed and presented to the regional MDM. 412 (69%) were directed towards palliative treatment following initial assessment. Of the remaining 181 (31%), PET-CT was undertaken in 180 and EUS in 99 (55%). FNA was undertaken in 31 (31%) of those undergoing EUS. One patient (1%) had a perforation related to dilatation prior to planned EUS. A covered stent was inserted and he was discharged from hospital. The findings on PET-CT directly changed management to a palliative approach in 30 patients (17%). A further 75 patients (42%) required further investigations based upon PET-CT including EUS (n=52), colonoscopy (n=9), review by other specialities (n=6), lymph node excision biopsy (n=2), radiological guided FNA/core biopsy (n=3) and MRI liver (n=2). EUS was performed to investigate nodal status in 51 (52%), to confirm the presence or depth of tumour invasion in 21 (21%) and to investigate other organ involvement in 3 (3%). 24 EUS procedures were performed routinely due to protocols used at that time. EUS+/-FNA directed patients to a palliative approach in 22 (22%). Management was directed to a radical approach in 72 (73%), and to endoscopic treatment (EMR/PDT) in 5 (5%). In the 98 patients who had both PET-CT and EUS, there was concordance of lymph node status in 79 (85%). Ten (11%) patients with negative nodes on PET-CT had positive nodes on EUS (of which 5 were suspicious at the time of staging CT), and 4 (4%) with positive nodes on PET-CT had negative nodes on EUS. Five had incomplete EUS due to stricturing.

Conclusion These results demonstrate that EUS has a complementary role in the staging process, with EUS playing an essential role in 11% of patients where confirmation of lymph node status, not identified on PET-CT, guided appropriate management.

Competing interests None declared.