

heartburn intensity at 8 weeks compared to baseline was measured. A successful PPI response was defined as >50% improvement in heartburn intensity at 8 weeks compared to baseline.

Results Normal value cutoffs were determined as 3.0% for mean acid exposure, 4.5% for worst day acid exposure, and 9.2 for mean DeMeester score. There was no difference in% heartburn improvement after 8 weeks PPI between patients with pathological and physiological acid exposure whether pathological reflux was determined by mean acid exposure (heartburn improvement 33.8%+36.6 vs. 26.6%+33.8, mean +s.d, $p=0.4$), worst day acid exposure (32.1+39.4 vs. 25.8+34.7, $p=0.6$), or by mean DeMeester score (33.7+36.3 vs. 26.5+35.6, $p=0.4$). Successful PPI response had a 77.5% positive predictive value for GORD, and only a 38.3% negative predictive value.

Conclusions Wireless pH study parameters in a large group of patients with heartburn referred for reflux testing show that PPI response is inadequate to make a diagnosis of reflux disease. Our data show that a large number of patients referred despite PPI response do not have reflux disease and should be weaned from the medication. An even larger proportion of patients do not have PPI response yet have pathological reflux and could be offered alternate management strategies.

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AUTOFLUORESCENCE-TARGETED CONFOCAL ENDOMICROSCOPY VERSUS WHITE-LIGHT FOR BARRETT'S OESOPHAGUS DYSPLASIA DETECTION: A MULTI-CENTRE RANDOMISED CROSS-OVER STUDY

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Introduction Dysplasia in Barrett's oesophagus (BO) is often invisible at white light endoscopy (WLE) and Seattle protocol is labour intensive. There is lack of randomised evidence that advanced imaging improves dysplasia detection. Probe-based confocal endomicroscopy (pCLE) is accurate for high-grade dysplasia (HGD) and intramucosal cancer (IMC) associated to visible lesions, but due to the narrow field requires combination with a red-flag technique for long-segment inconspicuous BO. We aimed to assess the diagnostic accuracy of optical biopsy by pCLE targeted by autofluorescence imaging (AFI) for any grade of dysplasia in patients without visible lesions.

Methods In this prospective multi-centre randomised cross-over trial BO patients were randomised to WLE with Seattle protocol (standard arm) <https://mail.addenbrookes.nhs.uk/owa/auth/logon.aspx?replaceCurrent=1&url=https%3a%2f%2fmail.addenbrookes.nhs.uk%2fowa%2f> for AFI-directed pCLE (experimental arm), and crossed over to the other arm after 6–12 weeks. The experimental arm consisted of (i)WLE inspection (ii)AFI to flag endoscopic areas (iii)pCLE on AFI areas and (iv)targeted biopsies. The 6 endoscopists were blinded to referral histology. Patients with unequivocal neoplastic lesions on WLE were excluded. Two GI pathologists confirmed histological diagnoses. The primary outcome was real-time diagnosis of dysplasia by pCLE. Two histological endpoints were analysed: (a) trial histology from all study

biopsies; (b) overall histology, which included (a) + biopsies within the 12 months of enrolment. Secondary outcomes included procedural time.

Results 133 patients completed both arms. 27.8% of patients received a diagnosis of dysplasia (LGD; $n=19$, HGD/IMC; $n=18$). In primary analysis (trial histology), pCLE had a sensitivity and specificity for dysplasia of 73.0% and 68.8%, respectively and 72.2% and 61.7% for HGD/IMC. Seattle protocol had a sensitivity of 73.0% for dysplasia and 83.3% for HGD/IMC, with no significant difference between arms. In secondary analysis (overall histology), pCLE had a similar sensitivity to Seattle protocol for dysplasia (61.8% vs. 49.1%; $p=0.09$) and HGD/IMC (70.0% vs 50.0%; $p=0.11$). The procedural time in the experimental arm was longer than standard arm (*Mean* mins 22.3 vs. 16.4; $p<0.05$), with evidence of learning curve (Q4 vs Q1 27.0 vs 19.0; $p<0.05$).

Conclusions In combination with AFI, pCLE detects inconspicuous dysplasia in approximately three quarters of cases. pCLE has equal diagnostic accuracy for dysplasia compared to Seattle protocol dispensing extensive sampling but at expense of longer procedural time.

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X-RAY PHASE CONTRAST IMAGING FOR STAGING OESOPHAGEAL TUMOURS: PRELIMINARY RESULTS FROM THE VIOLIN STUDY

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Introduction Oesophageal cancer is the 7th commonest cause of cancer death worldwide. Radiological staging of local oesophageal cancer is inaccurate. CT currently relies on attenuation of x-rays to generate contrast. Soft tissues have very similar attenuation properties so minimal contrast is generated.

X-ray phase contrast imaging (XPCI) uses refraction of x-rays as they pass through tissue instead of attenuation and provides much higher soft tissue contrast. This technology can be tuned to a resolution of approximately 10 μ m. This may allow for easy assessment of extent of disease infiltration.

We aimed to use XPCI to image oesophagectomy specimens to assess pathological tumour and nodal stage for oesophageal cancer

Methods Following ethical approval, 10 oesophagectomy specimens were obtained from patients having surgery for oesophageal cancers. These included both squamous and adenocarcinomas.

Specimens were fixed in formalin for 12 hours. Sutures were placed through tissue to enable co-registration between CT slices and histology sections. For some scans, tissue was then dehydrated with graded ethanol for between 4.5 hours and 72 hours before being imaged. A Rigaku (MicroMax 007) xray source was used at 40 kV and 20 mA; a detector with 50 μ m pixel size; and sample and detector masks made of graphite substrate with gold overlay. Phase contrast was generated using edge illumination technique.