Abstract OTU-17 Figure 1 Methylation levels in oesophageal biopsies before radio-frequency ablation, at relapse within the gastro-oesophageal junction and after re-treatment

(17.1%) had IM score 2-3, with corresponding mean methylation levels of 2.4% and 35.5%, respectively ($P=0.018$). In patients with GOJ-IM, who received RFA re-treatment, the Meth-Score decreased from 24% to 4.2% ($P=0.027$) as presented in figure 1.

Conclusions The methylation panel can differentiate grades of dysplasia in Barrett's and significantly correlates with the extent of IM at the GOJ. We propose the Meth-Score as an objective measure of residual and recurrent disease following RFA.

GOJ, gastro-oesophageal junction; IM, intestinal metaplasia; RFA, radio-frequency ablation.

OTU-18 USING X-RAY PHASE CONTRAST IMAGING TO IDENTIFY OESOPHAGEAL PATHOLOGY

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10.1136/gutjnl-2019-BSGAbstracts.253

Introduction Oesophageal cancer is the 5th commonest cause of cancer death in the UK. It accounts for 9,000 new cancer cases every year. Most oesophageal cancers are diagnosed at a late stage. Survival data shows that patients with early disease have a 37.5% 5 year survival compared to 8.4% and 4.9% for those with regional or distant disease.¹

Histological diagnosis of oesophageal pathology is an expensive and time consuming process with high inter observer variability. X-ray imaging is inexpensive and has not previously been used for imaging of soft tissue due to poor contrast resolution. X-ray phase contrast imaging (XPCI) uses refraction of x-rays as they pass through a tissue rather than attenuation, which provides much higher soft tissue contrast². It can also be tuned to have a depth resolution of between 5 μ m and 10 mm. This may allow for easy assessment of extent of disease infiltration.

Aims We aimed to use XPCI to image four types of oesophageal mucosa, normal squamous, non-dysplastic Barrett's oesophagus, Barrett's oesophagus with high-grade dysplasia and oesophageal adenocarcinoma.

Methods Following ethical approval, twelve biopsies were obtained both from patients attending for endoscopy at UCLH as well as from the CRUK Cancer Centre Biobank. Biopsies were imaged at the Diamond Synchrotron in beamline i13 using an XPCI technique called free space propagation. We reconstructed the images using MATLAB® software. These CT images were compared to histology from matched biopsies taken at the time of endoscopy or the original histological diagnosis if biobank tissue was used.

Results We successfully reconstructed CT images for all four tissue types achieving a resolution of ~5 microns. We were able to identify normal layered squamous mucosa as well as changes within the structure of the biopsies including glands and goblet cells. The four tissue types appear to have quite different morphology. In addition, the three dimensional tissue structure could be clearly identified, with cancer being the most disorganised.

This is the first time that XPCI has been used to image oesophageal biopsies. We have demonstrated the feasibility of the technique and the possibility of obtaining high resolution images which mimic histology with the extra benefit of demonstrating three dimensional structure.

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OTU-20 REDUCED STRICTURE RATES WITH A NOVEL HALO 360 RADIOFREQUENCY REGIME FOR BARRETT'S DYSPLASIA

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10.1136/gutjnl-2019-BSGAbstracts.254

Introduction In the UK, radiofrequency ablation (RFA) is established as treatment of choice for flat oesophageal neoplasia or after removal of focal lesions by endoscopic mucosal resection (EMR) to eradicate Barrett's mucosa. Standard practice is treatment with the HALO 360 Express RFA catheter. A specific complication of RFA is oesophageal stricture development. The UK national RFA registry has quoted a 11–17% rate of strictures requiring dilatation, with higher rates in patients treated with 12J rather than 10J paired ablations ($p<0.01$). Two 10J ablations, separated by a cleaning step requiring removal of the catheter device, is now standard of care. The cleaning step is a time-consuming part of the procedure and can be poorly tolerated.

Methods In December 2017, we adapted our practice to include irrigation with 30cc normal saline between 10J ablations as a cooling phase during the HALO 360 express procedure and removed the cleaning phase between ablations. We have audited patient and disease demographics and outcomes data, especially oesophageal stricture rate, for all patients who had first HALO 360 express between 1/12/16-1/12/18 in our hospital. This represents 12 months before and after technique

modification. Statistical analysis of variables was calculated using Fisher's exact test, Wilcoxon ranksum, and logistic regression analysis.

Results In the capture period, 36 patients had standard treatment, and 48 patients underwent modified technique. In the latter group, a significantly longer mean Barrett's segment was treated (6.1 cm vs 8.2 cm; $p=0.01$). We identified a stricture rate of 22.2% (8/36) in the standard treatment group, and 4.2% (2/48) in the modified group ($p=0.014$).

Stricture rate was significantly higher ($p=0.026$) with increasing Prague circumferential and maximum Barrett's length ($p=0.023$). There was no statistical difference in stricture rate when prior EMR or degree of dysplasia was considered.

A logistic regression model showed 85% reduced odds of stricture using the modified treatment ($p=0.036$) after adjusting for age, procedure type, grade of dysplasia, prior EMR, and Prague measurements.

Abstract OTU-20 Table 1

	No stricture	Stricture	Significance
Standard Procedure	28	8	$p=0.014$
Treat-Cool-Treat	46	2	
Prague Max Circ: (cm)Mean (SD)	4.06 (4.02)	7.7 (5.03)	$p=0.026$
Prague Max length: (cm)Mean (SD)	6.59 (3.62)	10.1 (4.84)	$p=0.023$
Prior EMR	36	2	$p=NS$
No EMR	38	8	
LGD	16	4	$p=NS$
$\geq$ HGD	58	6	

Conclusions Our audit demonstrates an improved outcome with the novel treat-cool-treat technique, with significantly lower rate of stricture development with this modified practice. This has an important bearing on patient care, as dilatation carries its own risk of complication. These findings suggest a benefit to the use of this novel adaptation of standard HALO 360 RFA treatment in Barrett's neoplasia.

Posters

PTU-042 IMPROVED DIAGNOSTIC YIELD OF SYMPTOM ASSOCIATION ANALYSIS

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10.1136/gutjnl-2019-BSGAbstracts.255

Introduction The Lyon Consensus 2018 recommends at least 3 symptoms for reliable symptom association analysis; however it is not clear if symptoms should be combined or analysed individually. This study aims to determine the impact of calculating symptom index (SI) as a measure of symptom association in combination or separately.

Methods SI measurements were collected for 139 consecutive patients who presented with reflux symptoms and received ambulatory pH monitoring at a tertiary referral centre in London. Typical symptoms were defined as heartburn (HB) and

regurgitation; atypical symptoms included chest pain, belch, laryngopharyngeal reflux and others (e.g. cough). A positive SI (SI+) was considered when $\geq 50\%$ of symptom events were preceded by a reflux episode within a 2 minute window. Results are presented as median (IQR; interquartile ratio). Comparisons were made using the Wilcoxon Signed Rank t-test.

Results All but one patient reported at least 3 combined symptoms. The remaining 138 patients (mean age 49 yrs; 35 males) reported a median of 30 (14, 68) symptoms overall. With all presenting symptoms combined, 13 (9.4%) patients exhibited SI+, median 73% (61%, 77%). The remaining 125 patients were SI-, median 13% (0%, 25%). When calculating symptoms individually, 25 further patients were identified with SI+ ($n=38$; 27.5%), thus increasing the diagnostic yield for SI+ by 3-fold; median 69% (50.5%, 99%) ($p<0.001$). HB in particular exhibited an additional yield of 14 patients ($p=0.04$).

When typical symptoms were combined (HB + regurgitation), 12 further SI+ patients were identified ($n=25$; 18.1%), median 68% (50%, 81%) ($p<0.001$), thus exhibiting a 2-fold increase in the diagnostic yield. Combining atypical symptoms only resulted in 3 additional patients with SI+ ($n=16$; 11.6%) ($p=0.067$); of which belch was the predominant symptom ($n=11$; 68.8%).

Compared to analysing all symptom together, a change in diagnosis (from SI+ to SI- or vice versa) was seen in 26 (18.8%), when symptoms were analysed separately; particularly for HB ($n=12$; 8.7%), combined typical symptoms ($n=28$; 20.3%) and combined atypical symptoms ($n=20$; 14.5%).

Increasing the threshold for inclusion from ≥ 3 to ≥ 6 symptoms resulted in the elimination of 10 patients and led to a greater likelihood for detecting SI+ for HB ($n=23$; 18.0%), typical symptoms ($n=23$; 18.0%) and atypical symptoms ($n=15$, 11.7%) compared to combining all symptoms together.

Conclusions Diagnostic yield of symptom-association analysis increases (up to 3-fold) when symptoms are analysed individually than when all symptoms are combined, likely because it focuses on the most relevant symptoms that the patient complains of.

PTU-043 ASSOCIATION BETWEEN OCCUPATION TYPE AND PROGRESSION OF BARRETT'S OESOPHAGUS TO OESOPHAGEAL ADENOCARCINOMA

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10.1136/gutjnl-2019-BSGAbstracts.256

Introduction To investigate association between the type of occupation and progression of Barrett's oesophagus (BO) to high grade dysplasia (HGD) and oesophageal adenocarcinoma (OAC).

Methods 2971 patients diagnosed with BO and enrolled with the United Kingdom Barrett's oesophagus Registry (UKBOR) formed the cohort for the study. Medical records were examined and patients' occupation were recorded. Patients without an occupation were excluded as were housewives and those unemployed. Histology from endoscopic surveillance of BO patients was sought with HGD or OAC used as the end point.