PTU-143 DIGITAL IMAGE ANALYSIS ENHANCES QUANTITATIVE IMMUNOHISTOCHEMISTRY IN THE SQUAMOUS-METAPLASIA-DYSPLASIA-CARCINOMA SEQUENCE

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Introduction We have previously shown how the Allred scoring system may be used to semi-quantify expression of nuclear biomarkers in the Barrett's (BE) to oesophageal adenocarcinoma (OA) sequence. Recently, a number of digital image analysis (DIA) platforms have been clinically validated for quantification of immunohistochemistry (IHC) in breast tissue. This study aims to compare pathologists scores (PS) with DIA for the quantification of nuclear biomarkers in BE to OA sequence.

Methods Paraffin embedded specimens were selected from 34 patients. Pathology grade (PG) was scored as 1 (non-dysplastic BE; n = 5), 2 (low grade dysplasia; n = 5), 3 (high grade dysplasia; n = 11) and 4 (OA; n = 14). Sections were immunostained with antibodies PLK1-M, PLK1-L and Geminin. Intensity (I-PS) (0 to 3+) and extent (E-PS) (0; < 1% = 1; 1–10% = 2; 10–33% = 3; 33–66% = 4; > 66% = 5) of staining were scored by 2 GI pathologists, and mean PS calculated. Intensity and proportions of +ve staining were digitally quantified using Ariol® software. Analysis classifiers were trained to identify thresholds of positive (brown/DAB) and negative (blue/Hx) nuclei (Figure A) in the areas of interest. Background tissue was digitally excluded. Mean intensity (I-DIA) and mean counts for DIA positive (red) and negative (green) nuclei (Figure B) were quantified to calculate percentage positivity (E-DIA) and compared with I-PS, E-PS and total Allred score (A-PS) using Pearson correlation coefficient.

Results Significant correlation was seen between E-DIA and A-PS ($r = 0.76$, $p = 0.006$; $r = 0.73$, $p = 0.008$; $r = 0.94$, $p = 0.0004$) with all biomarkers (PLK1-M; PLK1-L; Geminin). PLK1-L showed additional correlation between DIA and PS for intensity ($r = 0.985$, $p = 0.02$) and extent ($r = 0.95$, $p = 0.90$). Geminin showed additional correlations between DIA and PS for extent ($r = 0.99$, $p = 0.0008$) and PG ($r = 0.97$, $p = 0.03$). Following training, Ariol® analysis took a mean of 4mins (Range 3–5) per tissue region highlighted.

Conclusion This study has demonstrated how DIA may be used to quantify expression of nuclear biomarkers. Significant correlation between DIA with Allred score was seen with all biomarkers, but only PLK1-L correlated with intensity and Geminin with PG. Background staining ignored by pathologists was found to be a confounder for DIA, particularly with PLK1-M. Nonetheless, DIA has great potential to enhance current grading and risk stratification

systems for BE, and help select patients for targeted therapies dependent on biomarker expression.

Disclosure of Interest None Declared

PTU-144 CAN WE PREDICT PATIENTS WITH BARRETT'S DYSPLASIA WHO WILL PROGRESS TO MALIGNANCY DESPITE ENDOTHERAPY; RESULTS OF A PROSPECTIVE, SINGLE CENTRE EXPERIENCE

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Introduction In the treatment of Barrett's patients with intramucosal cancer (IMC) and high grade dysplasia (HGD), there is mounting evidence to support a combined endoscopic approach of endoscopic mucosal resection (EMR) and radiofrequency ablation (RFA). Despite the efficacy and safety of endotherapy in the treatment of IMC and HGD, some patients fail to respond to treatment or progress to oesophageal adenocarcinoma (EAC). We sought to examine the factors associated with the failure to respond or the progression to EAC from a tertiary referral practise.

Methods 105 patients with a mean age of 70 (range 43 – 90) years with HGD or IMC were treated between July 2008 and December 2012. The treatment protocol involved EMR of all nodular areas with subsequent RFA of all remaining Barretts epithelium. The RFA technique involved a combination of circumferential (HALO 360) followed by subsequent focal ablation (HALO 90) of residual areas of Barrett's tongues or islands. Patients were deemed to have completed endotherapy on eradication of dysplasia. A maximum of 2 HALO 360's and 3 HALO 90's were allowed. Patients who failed to respond to endotherapy or developed EAC were withdrawn from endotherapy. Median follow up was 9 (3 – 41) months.

Results 105 patients were treated (29 IMC and 76 HGD). Eighty patients have completed the treatment protocol to date (median of 1 HALO 360 and 1 HALO 90) and 42 (52%) of these had initial EMR. Eleven patients died during follow up, 2 from oesophageal cancer and the remaining 9 from non-oesophageal related causes. Eradication of Barrett's dysplasia was achieved in 80/91 (87%) and eradication of metaplasia in 61/91 (67%). Five (4.7%) patients progressed to EAC and 3 (2.8%) patients failed treatment as their IMC or HGD was refractory to RFA and required surgery. The demographics for those that progressed to EAC compared to those that did not (Non-EAC) are as follows. EAC; males 5 (100%), mean initial Barrett's length 7cm, those having pre-halo EMR 4 (80%) and initial pathology of 2 IMC (40%) and 3 HGD (60%). Non-EAC group; males 71 (73%), females 26 (27%), mean initial Barrett's length 7 cm, those having pre-halo EMR 42 (43%) and initial

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pathology of 28 IMC (28%) and 69 HGD (71%). Finally the time from first RFA to developing malignancy was a mean of 182 (42–733) days.

Conclusion In this cohort, there is a 4.7% chance of developing EAC, 2.8% of patients could not complete planned endotherapy and an 8.5% chance of death from non-oesophageal diseases. These outcomes are independent of the demographic, pathologic and endoscopic variables studied.

Disclosure of Interest None Declared

PTU-145 INCIDENCE OF EOSINOPHILIC OESOPHAGITIS IN A NEW ZEALAND POPULATION: A RETROSPECTIVE ANALYSIS

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Introduction Eosinophilic oesophagitis (EO) is the diagnosis in 10–15% of dysphagic patients in European and N American studies, most frequent in men aged less than 50 years. It is precipitated by aero-allergens. Diagnosis requires > 20 eosinophils per hpf on oesophageal biopsies. We investigated its incidence in a New Zealand population where the genetic profile is similar (92% NZ European descent) but the environmental exposure to flora very different.

Methods A retrospective review of 871 patients investigated by gastroscopy for dysphagia from 2006–11 at Dunedin hospital. Age, sex, endoscopic findings and whether biopsied were recorded from the endoscopy database. Histology was determined from the hospital PAS system and equivocal cases reviewed by a consultant histopathologist. Sex and age differences were interrogated with chi-squared and $P < 0.05$ was considered significant.

Results Average age of all patients was 68.7 years, 57.1% male. Common diagnoses were normal (27.7%), oesophagitis (21.7%), cancer (11.2%), dysmotility (7.3%), peptic stricture (5.0%). 20 patients (12 male, mean age 45.5 years) had EO. 5 of these had endoscopic abnormalities (2 × ridges, 2 × Schatzki rings, 1 × furrows). 351 patients (40.9%) had oesophageal biopsies, but only 86 of 434 where the underlying cause was not evidence ie no cancer, oesophagitis or peptic stricture. EO incidence was 2.3% of all patients, 5.7% of those biopsied but 23.2% of those where an alternative diagnosis was not evident. Annual incidence varied from 1.1 to 4%. The frequency of biopsies was greater in 2011 (73.6%) than previous years (26.9–44.1%) but the number of cases identified did not differ significantly (3.4–9.0% of those biopsied).

Abstract PTU-145 Table 1 Variation of Frequency of Biopsy and EO with Age and Sex

	Total	Biopsied	Eosinophilic oesophagitis
Male	497	224 (45.1%)*	12 (2.4%: 5.4% of those biopsied)
Female	374	133 (35.6%)	8 (2.1%: 6.0% of those biopsied)
< 50 years old	96	42 (43.8%)	12** (12.5%: 28.6% of those biopsied)
≥ 50 years old	771	313 (40.6%)	8 (1.0%: 2.6% of those biopsied)

* $P < 0.05$

** $P < 0.0001$

Conclusion EO appears less frequent in a New Zealand dysphagic population than in previous Northern hemisphere studies although this might be due to few biopsies where no macroscopic abnormality was seen. Biopsies are more frequent in men than women but EO no more likely. Biopsies are not more frequent in younger patients (< 50 y.o) but EO is much more frequent. The exact incidence of EO and reasons for discrepancies with previous studies merit further investigation.

Disclosure of Interest None Declared

PTU-146 INCIDENCE AND PREDICTORS OF EOSINOPHILIC OESOPHAGITIS IN DYSPHAGIA: A PROSPECTIVE ANALYSIS

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Introduction Eosinophilic oesophagitis (EO) causes dysphagia: 10–15% in European and US studies. It is diagnosed by finding > 20 eosinophils per hpf in oesophageal biopsies. We prospectively examined the incidence and clinical indicators of EO in a New Zealand population.

Methods Interim analysis of demographics, symptoms and associated diseases by questionnaire prior to endoscopy in 75 consecutive patients with dysphagia. Endoscopic findings were recorded with histology.

An initial analysis was performed to investigate whether age and gender of patients and symptoms (duration of dysphagia, intermittent or progressive symptoms, level of dysphagia, weight loss, choking, reflux odynophagia or a history of allergy) were associated with a final diagnosis of EO using chi squared or Fisher's exact test as appropriate then logistic regression used to determine the final model.

The sensitivity and specificity of endoscopic changes (furrows, ridges and rings) was determined separately and significance determined by Fisher's exact test.

Statistical significance was taken as $P < 0.05$. Ethics approval was obtained.

Results 75 patients, mean age 56 (range 15–94 years), 31 male (41%), had gastroscopy because of dysphagia. 64 (85.3%) completed the questionnaire and 67 (89.3%) had endoscopic biopsies. 12 (16%) had EO, mean age 36.7 years (range 18–62), 8 male. Endoscopic abnormalities suggestive of EO were seen in 7 EO patients (sensitivity 38.9%, specificity 91.2%: $P < 0.01$).

Allergy/atopy (hayfever, asthma, eczema, coeliac) was no more common in EO (54.5%) than those without (49.0%). The level of dysphagia was not pharyngeal in 5 EO patients. Duration of dysphagia was at least 6 months in all bar one EO patient (range 26–1248 weeks). Weight loss of 7–10 kg was reported by 4 EO patients. No patient responding to PPI therapy had EO. The strongest predictor of EO was age under 50 (OR 20.0 95% CI 3.4–117.8) with male sex also being significant (OR 6.7 95% CI 1.4–32.3). No other factor was statistically significant.

Conclusion EO is present in a dysphagic New Zealand population with a relatively high incidence. It is more common in younger males but there was no obvious association with allergy. Although endoscopic changes associated with EO were highly specific they were not sufficiently sensitive to depend upon. We would recommend oesophageal biopsies in all patients presenting with dysphagia without obvious cause at endoscopy.

Disclosure of Interest None Declared

PTU-147 INCIDENCE AND PREDICTIVE FEATURES OF PHARYNGEAL POUCHES IN A DYSPHAGIC POPULATION

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Introduction Pharyngeal pouches (PPs) commonly present with dysphagia. Perforation of a pouch at gastroscopy is a feared complication. Predicting patients likely to have PPs can enable selection for barium swallow to reduce this risk. PP incidence in a dysphagic population has been reported as 0.3%.¹ We investigated PP incidence and predictive demographic and clinical features in patients referred to a dysphagia hotline service over a 7 year period.²