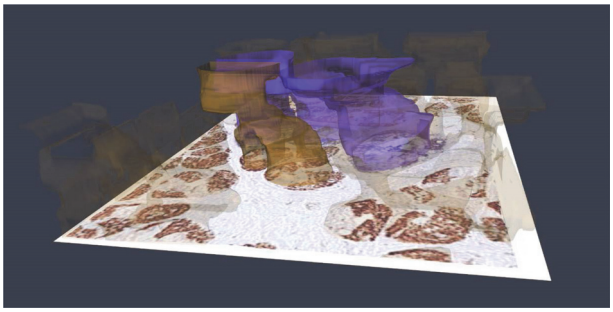

Abstract O36 Figure 1 3D reconstruction of gastric gland with CCO positive (brown) & negative regions (blue) visible

pathology software (Qupath), to analyse clonal patch sizes. Serial tissue sectioning was performed to trace CCO/MTCO1 mutated glands of interest for 3D reconstruction. Briefly, registration using a rigid and non-rigid B-spline transformation was applied, followed by a denoising step. Segmentation of glands was done by modelling using a Gaussian distribution, extraction of closing maps and applying an ellipsoidal fitting model. Cubic interpolation was then used for 3D modelling.

Results Patient ages were 31–65 years. Histologically, 8 were normal, 2 had active *H. Pylori* infection, 4 had evidence of previous infection with chronic inflammation, atrophy and intestinal metaplasia. CCO and MTCO1 clones were seen as wholly mutated glands and partially mutated glands. Overall clonal expansions were small, patch size analysis showed clones were most frequently singular glands, and rarely small patches (mean patch size = 1.65 glands). *H.Pylori* infection or chronic inflammation increased the frequency and size of patches compared to non-exposed tissue. 3D reconstruction (figure 1) allowed visualisation of the structure of the oxyntic gland, and tracing of CCO lineages allowed visualisation the functional architecture.

Conclusions This data describes the pattern of clonal expansions occurring in normal gastric epithelium. *H.Pylori* exposure and chronic inflammation lead to an increase of up to ten fold in frequency and size of clonal expansions. We observed a smaller increase in clonal expansions with advancing age. 3D reconstruction enabled tracing of mutant lineages in oxyntic glands, demonstrating for the first time the functional 3D architecture of the gastric stem cell unit. This work may help inform a model of pre-tumour progression in the chronically inflamed stomach.

Pancreas and neuroendocrine

O37 SCREENING FOR PANCREATIC CANCER IN HIGH RISK INDIVIDUALS: EXPERIENCE FROM A SPECIALIST CENTRE

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10.1136/gutjnl-2020-bsgcampus.37

Introduction Two groups of high-risk individuals (HRI) for pancreatic ductal adenocarcinoma (PDAC) have been defined. 1) Individuals from familial pancreatic cancer (FPC) kindreds and 2) individuals with identified genetic syndromes (GS) due to a germline mutation. Screening of HRI has been proposed to identify premalignant lesions and early stage malignancy with the aim of improving outcomes. Screening criteria have been formulated by a number of organisations including the international Cancer of the Pancreas-Screening consortium (CAPS) and the Italian Society for the Study of the Pancreas (IASP). Recent CAPS and IASP publications have reported a significant yield. A prior meta-analysis concluded that 135 patients with HRI were needed to be screened to identify one high risk lesion. The aim of this study is to review compliance with guidelines and the yield of HRI screening in our screening programme.

Methods The study is a retrospective review of a prospectively maintained database of HRI. EUS, was the preferred annual screening method. MRI and CT were used in some patients due to intolerance of endoscopy or preference. Data was cross-checked with the endoscopy database and electronic patient record.

Results A total of 110 individuals (71F) median age 46 (IQR, 41–57.75) were enrolled and underwent at least one screening procedure between January 2006 and January 2019. 108 (98.2%) met either or both CAPS/IASP criteria: 58 were classified as FPC and 50 GS. The 2 who didn't meet criteria were a patient with idiopathic juvenile onset chronic pancreatitis (CP) and a patient with idiopathic CP and one first degree relative with PDAC. 487 screening procedures were performed. 407 (83.6%) EUS, 49 (10.1%) CT and 23 (4.75%) MRI with a median of 4 [IQR, 2–6] procedures per individual and median follow up 4.3 years [IQR, 2–7.75]. 9 (8.2%) had solid or cystic abnormalities identified on EUS and underwent tissue sampling. Two patients subsequently underwent distal pancreatectomy. The first (60 yr old female with hereditary pancreatitis) had a 20 mm cystic lesion in the tail of pancreas on her 2nd EUS. Resection histology was mucinous cystic neoplasm (follow up 11 years). The 2nd (48 yr old male, FPC) had a 14 mm nodule in body of pancreas. Histology was low grade pancreatic intraepithelial neoplasia (follow up 11.5 years). There were no adverse events consequent on screening.

Conclusions In a large cohort of HRI undergoing screening, compliance with international criteria was good with no screening related adverse event. However, the yield to date has been low with only one high grade precursor lesion resected from 487 screening procedures.

O38 RICOCHET: A TRAINEE-LED NATIONAL PROSPECTIVE STUDY OF THE DIAGNOSTIC PATHWAY FOR SUSPECTED PANCREATIC CANCER

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10.1136/gutjnl-2020-bsgcampus.38

Introduction Pancreatic cancer is a deadly disease with a poor prognosis. Variations in the diagnostic pathway nationally may affect outcome, therefore a prospective study is necessary to map variation.

Methods Trainee-led prospective UK national study of the diagnostic pathway for suspected pancreatic cancer. Including all patients presenting within a 3-month study period, with 90-days follow-up. All investigation and MDTs were recorded in the REDCap database with a unique OpenPseudonymiser

digest to link pathways across secondary and tertiary care centres.

Results 95 centres across the UK entered data, including 2550 patients, and 2151 were included in the pathway analysis (excluding, benign disease, surveillance and cases with inadequate data). One third of patients had potentially resectable disease, and 50% of these underwent operative management during the 90-day follow-up. Patient demographics such as age and M:F ratio were similar between resectable and palliative groups, however the palliative group had a higher Charlson co-morbidity score. Resectable patients underwent more MDTs (2.48 vs 1.71) and investigations (3.12 vs 2.49) and had a longer time from first hospital contact to final MDT decision (50.88 vs 31.72 days) compared to the palliative cohort. Potentially operable patients had a longer diagnostic pathway than palliative patients. In addition, the number of days to reach a diagnosis was different within the surgical cohort, with a longer pathway in those found to be intra-operatively inoperable and receiving palliative bypasses.

Conclusions There is a wide variation between pathways for potentially resectable and palliative patients with suspected pancreatic cancer, with patient who ultimately undergoing palliative bypasses having longer diagnostic pathways

039 TRENDS IN PANCREATIC CYSTIC LESIONS UNDERGOING ENDOSCOPIC ULTRASOUND: 16 YEARS EXPERIENCE IN A TERTIARY CENTRE

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10.1136/gutjnl-2020-bsgcampus.39

Introduction Referral for endoscopic ultrasound (EUS) for further assessment and fine needle aspiration (FNA) is well recognised however there is little data on whether the characteristics of such lesions have changed over time. Recent guidelines have moved away from FNA and the effect of this on outcomes and surgical resection rates is unknown. The aim of this study was to assess trends in referral for EUS with respect to patient and cyst characteristics, pathological adequacy and surgical resection rates over a 16 year period.

Patients and Methods Retrospective analysis of the EUS database was performed over the period 2003 to 2018. EUS procedures for assessment of cystic lesions were identified and information concerning number per year, patient age and sex, cyst size, cyst site, FNA and diagnostic cytology rates, surgical resection and malignant surgical resection pathology were recorded (high grade dysplasia was counted as malignant). Kendall's tau test (continuous data) or the Chi squared (categorical data) for trend test was used to determine significant changes over time.

Results 1021 patients (mean age 63.6 years, 443 males) underwent EUS in our unit for the assessment of cystic lesions over the study period. There was no significant difference in patient age or sex at referral over the study period but there was a significant increase in the number of procedures per year from 2003 (n=11) to 2018 (n=116)(tau 0.800, p≤0.0001). There was a significant decrease in cyst size from 2003 (4.75 cm) to 2012 (2.6 cm)(tau -0.112, p=0.001) but no significant difference from 2013 (2.5 cm) to 2018 (2.6 cm)(tau 0.0119, p=0.67). There was a significant change in the cyst site over time mainly due to an increase in the proportion of cysts found in the body of pancreas (p for trend<0.0001). The percentage undergoing FNA reduced significantly from 100% for the first 9 years to 43.9% in 2018 (tau -0.817, p<0.0001). Non-diagnostic cytology rates fell significantly from 45.5% in 2003 to 29.4% in 2018 (p for trend=0.0048) and surgical resection rates fell from 36.4% to 11.2% (tau -0.683, p=0.0002). The number of malignant cysts (resected or not) also decreased significantly from 26.9% to 13.8% (p for trend=0.0097).

Conclusions Cyst referrals for EUS have increased significantly but cysts are smaller, less likely to be malignant, less likely to be resected and more likely to be in the body. Non-diagnostic cytology rates also reduced significantly which may be due to improved laboratory techniques and/or a learning curve effect. Guidelines have significantly reduced the number of FNA's performed during cyst assessment.

040 HIGH PREVALENCE OF SARCOPENIC OBESITY IN PANCREATIC EXOCRINE INSUFFICIENCY PATIENTS: A PROSPECTIVE STUDY

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10.1136/gutjnl-2020-bsgcampus.40

Background Pancreatic exocrine insufficiency (PEI) is an important cause of malnutrition. There is scarce information on the effect of PEI on body composition including muscle mass.

Objective To assess the prevalence of sarcopenia using a novel skeletal muscle recognition software in PEI patients compared to normal exocrine function. The secondary aim was to assess the prevalence of sarcopenia in PEI with normal BMI compared to those with PEI and obesity.

Methods Prospective recruitment of patients referred for endoscopic ultrasound examination for the assessment of chronic pancreatitis and/or abdominal pain. All pancreatic enzyme replacement therapy naïve and none had steatorrhoea as a main symptom. Age, sex, BMI, presence of DM, smoking and alcohol history were collected. FEL-1<200 mg/g was considered as PEI. Number of EUS features of CP were recorded. Cross section images were graded as per Cambridge classification. Images were analyzed using SliceOmatic software to measure skeletal muscle.

Results A total of 102 patients were recruited, median age 52 years, 52(51%) female. PEI was present in 46(45.1%) patients. Diagnosis of CP based on EUS and cross section images was made in 21(45.6%) patients in PEI compared to 7(12.5%) in normal FEL-1, $p=0.003$. Sarcopenia was prevalent in PEI group 31(67.4%) compared to normal FEL-1 18(32.1%), $p=0.0006$. Similar prevalence of sarcopenia was found in PEI with no-CP 66.7% and in PEI with CP 68.2%. Sarcopenic obesity was more prevalent in PEI 14/20 (70%) compared to normal FEL-1 8/28(28.6%), $p=0.008$. Sarcopenia and DM was strongly associated with PEI in multivariate analysis. Pack-year smoking was significantly higher in PEI, $p=0.03$.

Conclusions Sarcopenia was strongly associated with PEI. The prevalence of sarcopenia was the same in both PEI with CP and PEI with no-CP. Risk of sarcopenia still exit in PEI patients with obesity, therefore, quantification of skeletal muscle using digital analysis software could make a rapid, and objective assessment of nutritional status.