are limited. A perforation rate of 0.03% and attributable morbidity and mortality from pancreatic EUS fine needle aspiration (FNA) of 2.4% and 0.02% respectively are reported. We have examined PB EUS & FNA use in England, how it relates to pancreatic cancer (PC) therapy and associated mortality and adverse events.

Methods Adults undergoing PB EUS from 2007–17 were identified in Hospital Episode Statistics. A PC diagnosis within 6 months of EUS was required for PC cohort inclusion. EUS and FNA numbers per year, associated 7-day adverse events and 30-day mortality were examined. A logistic regression model examined the impact of variables on mortality and surgical resection.

Results 79,490 PB EUS in 69,120 subjects were identified. The number per year increased from 2,915 (29% FNA) to 12,764 (35% FNA) over the study period. 8,859 subjects were diagnosed with PC. Bleeding was coded in 0.4% of PB EUS. Perforation was coded in 0.03% and in 0.05% of the PC cohort. 1.6% of PB EUS subjects and 2.8% in the PC cohort died within 30 days of their final EUS. The following factors were associated with increased mortality: increasing age (odds ratio 1.04(95%CI 1.03–1.04), p<0.001); males (1.38(1.22–1.56), p<0.001); increasing co-morbidity (1.49 (1.28–1.75), p<0.001); FNA (2.20 (1.93–2.51), p<0.001); pancreatic cancer (1.37 (1.17–1.60), p<0.001); and low provider total PB EUS volume [baseline >782 EUS] 8–111 (3.99 (2.95–5.38), p<0.001), 112–782 (1.33 (1.13–1.57), p=0.001). Less deprivation was associated with reduced mortality: quintile 5 (0.76 (0.62–0.92), p=0.006).

32.9% of PC subjects had a surgical resection, 43.1% received chemotherapy alone and 33.1% had no active therapy. Increasing age (0.97(95%CI 0.96–0.97), p<0.001), increasing co-morbidity score (0.77(0.60–0.98), p=0.034) and multiple EUS procedures prior to PC diagnosis (0.80 (0.66–0.98), p=0.033) were all associated with a lower resection rate. The two least deprived quintiles were associated with an increased resection rate (quintile 4 1.33 (1.11–1.59), p=0.002), quintile 5 1.33 (1.11–1.59), p=0.002).

Conclusions The number of PB-EUS undertaken in England has increased six-fold over the last decade, with an increased proportion of FNA. Deprivation and low provider volume were associated with 30 day mortality. A third of subjects undergoing PB EUS for PC did not receive surgery or chemotherapy. The results of this study support a reappraisal of the provision of and indications for PB EUS.

OTU-04 ARTIFICIAL INTELLIGENCE FOR REAL-TIME POLYP LOCALISATION IN COLONOSCOPY WITHDRAWAL VIDEOS

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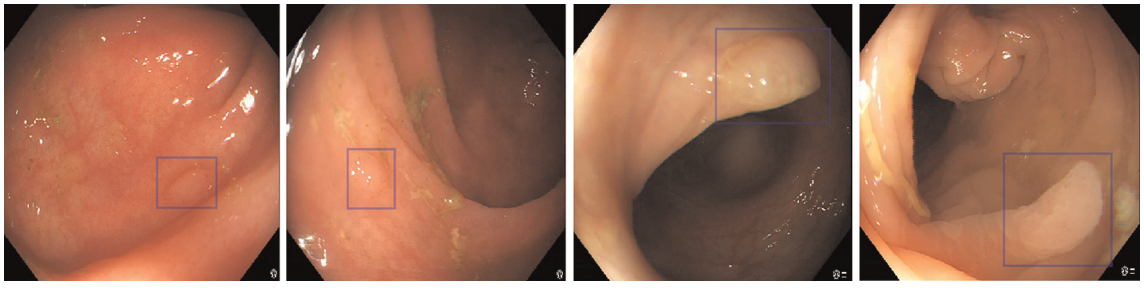
Introduction Artificial intelligence (AI) can potentially improve adenoma detection rates. Previous work focussed on still images and selected video sequences which may be subject to bias and lack clinical utility. This study assesses whether a convolutional neural network (CNN) developed using still images and short video sequences from a multicentre dataset using different processors generalises effectively to locate polyps in a new video dataset consisting of complete colonoscopy withdrawals (caecum to rectum).

Methods Our group previously developed a CNN using 4664 polyp test frames from the MICCAI 2015 polyp dataset. Here, we created a new dataset using 17 complete colonoscopy withdrawal videos, previously unseen by the CNN, containing 83 polyps consisting of 83,716 frames (14,634 polyp & 69,082 non-polyp) using Olympus EVIS LUCERA CV290 (SL) processors and colonoscopes. White light frames were annotated by drawing bounding boxes around polyps. Size, morphology, histopathology and location was recorded for each polyp (table 1). Low quality frames (e.g. blurred) were excluded. Half the procedures were randomly selected to create a testing set. A true positive was scored if the CNN prediction overlapped with the bounding box. A false positive indicated a non-overlapping location.

Results The CNN operated at real-time video-rate achieving a sensitivity of 91.6% and positive predictive value 75.3% in the MICCAI test set. When the MICCAI trained CNN was tested on our previously unseen colonoscopy procedures, it achieved a sensitivity of 76.6% and specificity of 78.9%. This CNN was fine-tuned by using polyp positive frames from our training dataset. This improved sensitivity to 84.5% and specificity to 92.5%.

Conclusion Whilst the CNN achieved excellent results on the public still image dataset, it is more challenging to generalise results to complete colonoscopy withdrawals. Fine-tuning using our dataset improved performance. Furthermore, our procedures were performed by experts, including a significant proportion of right sided flat elevated and subtle sessile serrated lesions which were not evaluated in recent publications. AI



Abstract OTU-04 Figure 1

development should include complete colonoscopy withdrawals to reflect true clinical practice and focus specifically on identifying challenging polyps that may be overlooked.

Abstract OTU-04 Table 1

Video Dataset	
Lesions (n)	83
Mean size (mm)	5.4
Morphology (Paris Classification)	
Protruded (Ip/Isp/Is)	35
Flat elevated/Flat (IIa/IIb)	48
Location	
Right Colon	58
Left Colon	20
Rectum	5
Pathology	
High Grade Tubular Adenoma	1
Low Grade Tubular Adenoma	61
Sessile Serrated Lesion	14
Hyperplastic Polyp	7

OTU-05 OUTCOMES OF TRANSANAL ENDOSCOPIC MICROSURGERY (TEM) VERSUS ENDOSCOPIC RESECTION (ER) OF LARGE RECTAL ADENOMAS

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Introduction Resection of large rectal adenomas by TEM or endoscopic resection (ER) varies by institution and region. There is a paucity of data directly comparing these strategies and the procedure of choice remains under intense debatable. We report outcomes of TEM and ER of large rectal adenomas from a large tertiary cohort.

Methods Large (≥20 mm) rectal adenomas resected by TEM or ER (2009–2018) were analysed. From 2009–2011 all rectal adenomas were treated by TEM, after which the primary resection strategy changed to ER. Outcomes were compared between techniques.

Results 258 rectal adenomas were resected by TEM (n=73), EMR (n=61) and ESD/Hybrid ESD (n=124) with a mean size of 46 mm for TEM vs 62 mm for ER (p<0.001). 100% of patients undergoing TEM required hospital admission vs 22% for ER (p<0.001), and 100% required general anaesthesia for TEM vs 13%% for ER (p<0.001). En bloc resection was achieved for 99% of ESD resections, 52% of TEMS, 26% of EMR and 12% of hybrid ESD (p<0.001). Complications were similar (p=0.33). Recurrence occurred in 4% after ESD, 18% after EMR, 20% after Hybrid ESD and 42% after TEM (p<0.001). No patients undergoing ER required surgery as a result of a complication.

Conclusion Despite significantly larger lesion sizes, ER in our institution provides far superior results for patients than TEM with relatively few patients requiring general anaesthesia or hospital admission and lower recurrence rates especially with ESD. This has led to a policy of ER for all apparently benign rectal tumours regardless of size and, more recently, an ESD-first approach for all lesions.

OTU-06 UPPER GASTROINTESTINAL BLEEDING IN SCOTLAND: TRENDS IN DEMOGRAPHICS AND OUTCOMES 2000–2015

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Introduction Upper gastrointestinal bleeding (UGIB) remains a common cause of presentation and admission to hospital in the UK, with the incidence in Scotland one of the highest in the world. Over the past 15 years there have been several developments to improve management of patients with UGIB.

Methods Our aim was to investigate the number of patients presenting to Scottish hospitals with UGIB between 2000–2015 and assess the difference in demographics, aetiology of bleeding and clinical outcomes, including those for weekends and weekday presentations. Data were collected from SMR01 hospital admissions records and GRO death certificates for the period 1st January 2000 to 31st December 2015 and analysed in the national safe haven. All outputs were disclosure-checked for confidentiality purposes. Admission and death rates were computed for each year with trends over the study period estimated using Poisson regression. Standard errors were adjusted to account for any serial dependence.

Results A total of 129,404 patients presented to Scottish hospitals with UGIB between January 2000 and December 2015. Mean age at admission increased over this period from 59.2 years to 61.4 years (P=0.049). There was no difference in the annual number of patients over the 15-year period. The incidence of UGIB was highest in the more deprived quintiles, although there was a reduction in incidence in the three most deprived quintiles over the study period (SIMD1; P<0.001: SIMD2; P=0.002: SIMD3; P=0.001). There was a significant decrease in 30-day case-fatality from 10.1% in 2000 to 7.9% in 2015 (p<0.001), which was significant across all the deprivation quintiles (P<0.001). This reduction was seen for both variceal and non-variceal bleeding (IRR 0.967; P<0.001 and IRR 0.980; P<0.001 respectively) with deaths as a proportion of admissions declining fastest in the variceal compared to the non-variceal group (24.4% to 14.5%, and 9.8% to 7.8% respectively). The mean length of stay also fell from 3.9 days to 2.1 days, an average decline of 0.14 days per year (95% CI .15612 - .11723; P<0.001). There was no difference in 30-day case-fatality between patients presenting at weekdays or weekends.

Conclusions The number of patients presenting with UGIB to Scottish hospitals annually has remained similar over the 15-year study period. However, case-fatality and length of hospital stay has fallen, despite a rise in the mean age of patients.