

PTH-002 COLONOSCOPY AFTER BOWELSCOPE (BS) FLEXIBLE SIGMOIDOSCOPY (FS) – URGENT OR ROUTINE?

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Introduction and aims The implementation of BS (1 off FS for 55 year olds) has led to significant pressures on endoscopy units with large numbers of procedures. In addition patients with certain findings (which include number, size, dysplasia and villous component degree of adenomatous polyps) will require colonoscopy (FC). This has to be done within 2 weeks. The North of Tyne screening centre serves a population >8 60 000. 'Roll out' of BS started in 2014 and now covers patients enrolled in 50% of our regional GP practices.

At this 'halfway stage' we aimed to assess:

- Attendance and findings in those invited
- Proportion of patients who require FC after FS and significance of proximal pathology
- Incidence and sites of any malignancy
- The proportion with neoplasia after colonoscopy requiring future surveillance

Method Data was collected on all patients who had FC after FS in the BS program for the 12 months from 1/1/2017 (obtained from the central database and crosschecked with local records). We reviewed all endoscopy and histology reports to obtain patient demographics, FC indication, findings and all histology. The extent of each FS was accurately recorded with aid of Olympus imager (scope guide).

Results 2698 of the 3629 who responded to the written invitation attended for FS.

130 (4.8% of attenders) met criteria for FC – Main reasons: ≥10 mm polyp (34%); ≥3 polyps (21.5%); villous histology (21.5%); anticoagulant/antiplatelet use (4.6%)

After colonoscopy, 54 have neoplasia requiring for future surveillance – 33 high risk category (1 year); 21, intermediate risk (3 years).

4 patients had malignancies: 1x rectal polyp cancer; 1x sigmoid cancer (T2N0); 1x descending colon cancer (T3N1M1); 1 splenic flexure cancer (T4N1);

At colonoscopy, 37 patients had adenomas proximal to the splenic flexure but all were <10 mm with low-grade dysplasia

Conclusions

- 74% of patients who initially showed interest attended for FS
- Almost 5% of patients attending for BS require FC; of these 41.5% will have intermediate or high risk neoplasia requiring future surveillance
- A small proportion (1.5/1000 screened) of attenders were found to have a cancer
- 28.5% had neoplastic lesions beyond the splenic flexure, none with high grade dysplasia/cancer

Therefore if the colon is examined to the splenic flexure at FS during BS screening, our data suggests that FC can be safely booked as routine (within 6 weeks). This will ease some of the pressure on endoscopy units.

PTH-003 QIP: IMPROVING QUALITY OF PHOTODOCUMENTATION AND LESION REPORTING IN UPPER GASTROINTESTINAL ENDOSCOPY

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Introduction The gold standard investigation for upper gastrointestinal (GI) symptoms is oesophago-gastro-duodenoscopy (OGD). The British Society of Gastroenterology (BSG) released a position statement of quality standards in upper gastrointestinal endoscopy in August 2017, including the recommendation to photodocument 8 anatomical sites in the upper GI tract to optimise mucosal inspection and lesion recognition. We aimed to assess and improve the quality of OGD photodocumentation and lesion recognition in line with this recommendation.

Methods 184 OGD reports were audited from three one-week audit cycles. Cycle 1: immediately following guideline release and prior to intervention; cycle 2: immediately following intervention (departmental teaching and poster display of recommended photos in endoscopy procedure rooms); cycle 3: 2 weeks after intervention. Total number of photos taken per procedure, number of anatomical sites photodocumented, and number of lesions detected were recorded.

Results From cycle 1 (pre-intervention) to cycle 2 (post-intervention) the mean number of photos per OGD increased from 5.3 to 8.6 respectively ($p=0.095$) and mean number of anatomical sites documented increased from 3.8 (47%) to 6.9 (86%) ($p<0.001$). The mean number of lesions documented per OGD increased from 0.5 to 1.2 ($p=0.230$). Improvement in practice was sustained through audit cycle 3 (2 weeks after intervention): mean photos 8.5, mean required sites documented 7.4 (92%) and 0.7 diagnoses per OGD.

Conclusions Immediately following release of BSG quality standards in upper GI endoscopy, departmental adherence to recommendations for photodocumentation was poor. A simple intervention of departmental teaching and poster displays resulted in a significant improvement in the quality of photodocumentation and a trend towards improvement in detection of lesions. Improvement in quality was sustained at re-audit.

PTH-004 DEEP LEARNING FOR REAL-TIME AUTOMATED POLYP LOCALISATION IN COLONOSCOPY VIDEOS

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Introduction Colonoscopic polypectomy can prevent colorectal cancer. Polyp detection rates vary considerably due to human error and missed adenomas may contribute to interval colorectal cancers. Automated polyp detection using deep learning may avoid these problems. Previous work focused on detecting the presence of polyps in individual frames captured from videos. Our aims in this pilot study were to extend this to video

sequences and to explore future-proofing by using algorithms trained on old image processors to locate polyps found using newer endoscopic technologies.

Methods We trained and validated a Convolutional Neuronal Network (CNN) on 18 517 frames created by merging research colonoscopy datasets (CVCClinic, ASUMayo, ETIS, CVCVideoDB and CVCColon) from the Medical Image Computing and Computer Assisted Intervention Society challenges. 75% of frames contained polyps in both standard and high definition (HD) from older processors including Olympus Exera II (160/165 series) and Pentax EPKi 7000 (90i series). Our test set consisted of 11 HD videos featuring polyps in white light collected using the latest Olympus 290 endoscopes at a UK tertiary centre. Estimated median polyp size was 4 mm (range 2–15) and morphology included (Paris Classification IIa=4, Is=6 and IIa +IIs LST-G=1). Images were manually annotated by drawing bounding boxes around polyps and quality controlled by removing uninformative frames (e.g. blurred). A total of 2611 polyp-containing frames were analysed in the test set. A true positive was scored if the computer-generated segmentation mask prediction overlapped with the bounding box. A false positive indicated a non-overlapping location (more than one can occur per frame).

Results Our network operated at real-time video rate. F1-score accuracy was 92.5%. Sensitivity for polyp localisation was 98.5% and per-frame specificity 75.4%. Positive predictive value was 90.1%. Incorrect segmentation mask locations were predominantly limited to 3 videos and were generated by artefacts not represented during training.

Conclusion We demonstrate through analysis of video frames that a CNN can locate polyps with high accuracy in real-time. The algorithm was trained using multiple endoscopy processors and worked with HD images from a new processor. This suggests that the CNN could remain useful as new endoscopic technologies are introduced. Further work will train our model on larger datasets including complete colonoscopy procedures. This should improve accuracy further. Such a system could be used as a red-flag technique to reduce missed adenomas during colonoscopy.

PTH-005 DYSPEPSIA IN 2017: ARE WE ADHERING TO GUIDELINES?

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Dyspepsia in 2017: are we adhering to guidelines?

Introduction Recent NICE guidance advocates a test-and-treat strategy for *H. pylori* in the management of dyspepsia without red-flag features (simple dyspepsia). In addition, NICE recommends trialling symptomatic management with proton pump inhibitors (PPI) or histamine receptor antagonists (H2RA). Upper gastrointestinal (UGI) endoscopy is recommended only if symptoms persist despite these strategies.

The aim of this study was to assess degrees of adherence to current guidelines across various UGI endoscopy referral pathways (for example, GP direct access and gastroenterology clinics).

Methods A single-centre, retrospective analysis was performed for patients who underwent endoscopy from 2016–2017, at a large district general hospital in North London. Data was obtained from Unisoft Endoscopy Reporting Tool software,

alongside electronic patient records. Patient data was scrutinised for the following features prior to endoscopy:

- Presence of red-flag symptoms
- Endoscopy referral pathway type
- *H. pylori* investigations and treatment
- Management with PPI or H2RA

Results Data was collected for 250 patients who underwent UGI endoscopy for dyspepsia.

53% were simple dyspepsia cases. 15% had clear red-flag symptoms warranting urgent endoscopy. 4% had symptoms warranting non-urgent endoscopy. 28% had no data available regarding red-flag symptoms.

The majority of patients were referred for endoscopy either from gastroenterology clinics (47%) or GP direct access (43%). Other sources included surgical clinics and 1-stop clinics (10%).

60% of patients underwent *H. pylori* investigations prior to endoscopy. 35% had not been tested by the time of endoscopy. 5% had no data available regarding investigations.

33% of patients did not trial management prior to endoscopy. Of simple dyspepsia cases, 21/133 had not trialled management (11 had been referred from gastroenterology clinics, 6 from general surgery clinics, and 4 by GP direct access).

Additionally, 51/133 of simple dyspepsia cases had not undergone *H. pylori* stool testing prior to endoscopy. The majority of these patients had been referred from gastroenterology clinics or GP direct access.

Conclusions The majority of patients (53%) included in the study had no symptoms warranting urgent endoscopy. However, over 33% of patients had no *H. pylori* testing prior to endoscopy – furthermore, 15% had no trial of treatment. Lack of adherence to guidelines was present across all referral pathways.

For an endoscopy service to function effectively, it must not be overloaded with inappropriate referrals; failure to follow guidelines increases this burden. Despite widespread availability of these guidelines, implementation remains poorly practised. Thus, NICE endoscopy referral guidance requires better implementation, by means such as increasing awareness in both primary and secondary care.

PTH-006 SHOULD WE PERFORM COLONIC POLYPECTOMY IN PATIENTS OVER 80?

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Introduction Previous studies highlight the increased risks attendant with colonoscopy in the elderly population¹. Case reports and reviews also suggest avoidance of polypectomy for <2 cm polyps in patients ≥85 years². We aimed to assess the outcomes of polypectomy in patients ≥80 at our trust with five years of follow up.

Methods Colonoscopic data was analysed from the endoscopy reporting system for patients aged ≥80 who had colonoscopy and polypectomy performed in 2011 and 2012. Endoscopy reports, histology reports and patient notes were reviewed. Mortality and cause of death within 5 years of the procedure date were also recorded from the patient mortality coding database. Patients with a synchronous cancer at index procedure were excluded from 5 year colorectal cancer (CRC) mortality analysis.