poor quality of capsule endoscopy images has negative effect on diagnosis of small bowel malignancy

Diana Yung*, Anastasios Koulaouzidis, John Plevris. The Royal Infirmary of Edinburgh, Edinburgh, UK

Introduction Capsule endoscopy (CE) is the prime mode of investigation for small bowel (SB) pathology. It relies heavily on image quality, which is commonly affected by poor preparation. Currently, there is no widely-accepted method for quantifying visualisation quality. We studied the contribution of various image parameters to visualisation quality and their effect on certainty of diagnosis of small bowel lesions.

Methods Five clear CE images of common SB pathology were processed for 3 parameters to simulate increasingly poor SB preparation: opacity (colour-matched to luminal content; 10–90%, 10% increments), blurriness (radius 1–10px; 1px increments), contrast (50–50%; 10% increments). 9 expert readers evaluated whether images were adequate for diagnostic purposes. The points where perception of image quality changed significantly were determined for each parameter. Three further sets of SBCE images (vascular, inflammatory and malignant lesions) were processed for 4 points/parameter. 20 experienced-expert CE readers from reviewed the resulting images.

Results In vascular and inflammatory lesions, diagnostic certainty was least affected by increasing image opacity, requiring opacities >90% before most readers considered images inadequate for diagnosis. The greatest negative effects of image opacity were seen in malignancy where significantly fewer readers found images adequate at >50% opacity. Similar results obtained with increasing blur radius, simulating motion blur and poor focus. The proportions of readers finding vascular and inflammatory images adequate for diagnosis did not drop significantly at wider blur radii, while the proportion who found images of malignancies diagnostically adequate dropped at blur radius 6px. Decreasing contrast had greater negative effect than raised contrast, most obvious in malignant lesions.

Conclusions Poor visualisation quality in all parameters had the greatest effect on malignant lesions. Software to increase contrast and sharpen images can improve visualisation quality; smart frame rate adaptation could also improve the number of high-quality frames obtained. Furthermore, our results suggest that thoroughness in SB cleansing is most important when there is suspicion of SB malignancy, to improve diagnostic certainty of images obtained.

PTU128 DOUBLE-HEADED CAPSULE ENDOCOPY: REAL-WORLD EXPERIENCE FROM A MULTICENTRE BRITISH STUDY

1Diana Yung*, 1Joanna Brzeszczynska, 2Imdadur Rahman, 3Leena Sinha, 4Reena Sidhu, 5Prathul Patel, 6Sue Mason, 7Mark McAllindon, 8John Plevris, 9Anastasios Koulaouzidis, 10The Royal Infirmary of Edinburgh, Edinburgh, UK; 11Southampton General Hospital, Southampton, UK; 12Queen’s Hospital, Romford, London, UK; 13Royal Hallamshire Hospital, Sheffield, UK

Introduction Double-headed capsule endoscopy (CE) is a well-established mode of investigation for small bowel (SB) pathology. This study examines the potential benefits of using double-headed capsules compared to conventional single-headed ones in a real-world cohort of patients referred for CE. We present initial results from the first multicentre British study.

Methods Over a 9-month period, patients referred for routine SBCE at 4 tertiary referral centres in the UK underwent double-headed CE in lieu of conventional single-headed CE using MiroCam MC2000 capsules. CE was carried out as per routine protocols at each centre. Clinical data were anonymised. One head (L/R) was chosen at random and reported by an expert reviewer. The double-headed recordings, also anonymised and randomised, were reported by another expert reviewer. In centres with only one expert reviewer, double-headed CEs were read after a 4-week interval to minimise recall bias. For each CE, numbers and types of findings and
overall conclusion/diagnosis were compared between single and double-headed examinations.

**Results** 211 CE examinations were performed. 7 failed to reach the SB; 204 cases were analysed. Indications were (a) SB bleeding; (b) SB inflammation or reassessment of known inflammatory bowel disease (IBD); (c) SB neoplasia including suspicious radiological imaging and (d) others e.g. celiac disease. Results are presented in **Table 1**.

**Conclusions** The use of double-headed CE provides more information which has the potential to change clinical diagnosis and therefore management. Therefore, the routine adoption of double-headed CE in SB assessment should be considered.

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**Introduction** Colonoscopy is the investigation of choice for lower gastrointestinal symptoms. We wanted to review the indications and outcomes of colonoscopy in the very elderly patients at a district general hospital.

**Methods** We retrospectively reviewed all patients ≥85 years who underwent colonoscopy from June 2016–June 2018 using our endoscopy reporting system (Endobase). We collected data on demographics, indications for the procedure, bowel preparation type and success, sedation and analgesia rates, caecal intubation rates, findings and complication rates.

**Results** From June 2016–June 2018, there were 243 patients ≥85 years who underwent colonoscopy, mean age 87.0 years (range 85–96), males 41.8%, females 51.9%. The commonest indications were: change of bowel habit (n = 75, 18.3%), abnormal imaging (n=30, 12.3%), rectal bleeding (n = 25, 10.3%), colon cancer surveillance (n = 10, 4.1%), IBD surveillance (n = 2, 0.4%), and others (n = 3, 7.4%). All patients went through bowel preparation with PEG solution with excellent or adequate results in 209 (86.0%), and inadequate in 34 (14.0%). Fentanyl was used in 175 patients (72.0%, average dose 43.2 mcg), Pethidine in 17 (7.0%, average dose 26.5 mcg), Entonox in 27 patients (11.1%), and Midazolam in 184 patients (75.7%, average dose 1.8 mg). Unadjusted caecal intubation rate was 84.4% (n=203), rising to 88.7% when adjusted for obstructing lesions. Commonest causes for incomplete procedure (n=38) were: obstructing lesions (n=12, 31.6%), inadequate bowel preparation (n = 7, 18.4%), patient intolerance (n=6, 15.7%), and diverticulosis (n=5, 13.2%). Cancer was found in 21 patients (8.6%). Polyps of any size were found in 90 patients (37.0%), but significant polyps (polyps ≥10 mm) were found in 42 patients (17.3%) with average polyp size of 20.7 mm (range 10–80 mm). Other significant findings included colonic diverticulosis (n=147, 60.5%), haemorrhoids (n=73, 30.0%), and IBD (n=4, 1.6%). Three patients developed peri-procedure complications: Oxygen desaturation and tachycardia (n=1, 0.4%), hypotension (n=1, 0.4%) and chest pain and reduced consciousness, requiring reversal agent (n=1, 0.4%). There were no significant bleeding or perforation reported for this cohort.

**Conclusions** Overall colonoscopy seems to be safe in the extreme ages with low complication rates. The caecal intubation rate was lower than the BSG/JAG recommended cut off 90%, and this was mostly attributable to inadequate bowel preparation and obstructing lesions. If both of these limitations are adjusted for, the completion rate was 91.5%.