

Results There were 28 instances of buried FREKA PEGs among 21 patients. Nowadays, our usual management is to deploy a new PEG in a separate site, then attempt endoscopic bumper removal using a wire-guided 15Fr dilatation balloon introduced via the cut stump of the buried PEG (balloon push technique). The balloon dilates the track and grips the internal surface of the bumper during forward traction.

Conscious sedation was used in 21 instances and general anaesthesia in 7. It was possible to deploy a new PEG in 26 instances (93%) and to unbury the bumper endoscopically in 24 instances (86%). An external (push-pull) T snare technique was required twice.

There were no immediate complications; all but one survived for at least 1 year and 11 patients (52%) remain alive after 1–130 months. Three required surgical removal \pm deployment of a new PEG. A patient for whom the bumper stump was left alone and a new PEG deployed had recurrent infections at the stump site during his three remaining years.

Conclusions Buried PEG bumpers can normally be managed safely endoscopically. If this fails, and the patient is expected to survive, surgery should be done to remove them. General anaesthesia was needed in around a quarter. Long term survival may be expected in some patients. Although buried bumpers could be avoided with meticulous daily care of these patients, when encountered appropriate intervention is necessary to deal with this uncommon complication associated with PEG tube feeding.

PTH-038 RESONANCE ENHANCED SELF-PROPELLED CAPSULE ENDOSCOPY FOR SMALL BOWEL EXAMINATION

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Introduction Capsule endoscopy has become established as the primary modality for examining the small intestinal mucosa. However, its reliance on peristalsis for passage through the intestine causes variable locomotion speeds, which can lead to incomplete visualisation of the mucosa and potentially missed pathology. In addition, lengthy videos resulting from long transit times can be both time-consuming and burdensome for clinicians to examine.

Methods A resonance enhanced self-propelled capsule endoscopy (Liu et al., *Int. J. Mech. Sci.*, 66:2–11, 2013; Liu et al., *Nonlinear Dyn.*, 83:1029–1041, 2016) was developed for small bowel examination. The driving principle of this technique is that rectilinear motion of the capsule can be generated using a periodically driven internal mass interacting with the capsule's main body (as a hammer), in the presence of intestinal resistances. A small 'hammer' actuator, which was excited by an on-off square wave signal, was mounted in the capsule prototype. The capsule can perform forward and backward progression by modulating the amplitude and frequency of the square wave excitation. Early proof-of-concept tests in a laboratory environment were carried out for different capsule-intestine contact conditions by utilising a synthetic small intestine.

Results Three contact scenarios were investigated: capsule moving on an aluminium bench (Case 1), on a flat synthetic small intestine (Case 2), and in a tubular synthetic small intestine (Case 3). Extensive tests under different control

parameters (e.g. varying the frequency of the excitation between 1–20 Hz), were conducted for each case, and the main results are: (1) The maximum average speed of forward progression was 5 mm/s for Case 1, 7 mm/s for Case 2, and 2 mm/s for Case 3. (2) In all three cases, the maximum average speed of backward progression was 1 mm/s. (3) The energy efficiency of the capsule was up to 1.5 mm/J.

Conclusions Assuming a maximum small intestinal length of 6 m and capsule speed of just 2 mm/s (Case 3), small intestinal transit could be reduced to no more than 50 minutes, offering the potential for a 'live' and controllable examination. The energy efficiency of the prototype equates to a total of 4 kJ energy for a complete small bowel examination, which could be provided by currently available button cells.

PTH-039 THE COST-EFFECTIVENESS OF RADIOFREQUENCY ABLATION FOR GASTRIC ANTRAL VASCULAR ECTASIA REFRACTORY TO FIRST-LINE ENDOSCOPIC THERAPY

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Introduction Argon plasma coagulation (APC) is the most commonly used treatment within the UK NHS for Gastric Antral Vascular Ectasia (GAVE), a chronic condition that can cause debilitating symptoms secondary to chronic blood loss. This economic evaluation provides a preliminary assessment of the cost-effectiveness of radiofrequency ablation (RFA) in this patient population, which recent evidence suggests may offer improved safety and effectiveness when used to treat APC-refractory GAVE patients.

Methods A Markov model was constructed to undertake a cost-utility analysis for adults diagnosed with GAVE symptomatic of iron-deficiency anaemia. The economic evaluation used a UK NHS and personal social services (PSS) perspective, with a 20-year time horizon, and three-month cycles. Patients transfer between health states defined by haemoglobin level: mild (11 to 12 g dl⁻¹), moderate (9 to 10 g dl⁻¹) and severe (< 8 g dl⁻¹). The clinical effectiveness data were sourced from literature and expert opinion. Resource use and costs were reflective of the UK NHS, and parameter uncertainty was explored using probabilistic sensitivity analysis (PSA). Benefits were qualified using Quality Adjusted Life Years (QALYs), with utility weights taken from the literature. The primary output was the Incremental Cost-Effectiveness Ratio (ICER) expressed as cost per QALY gained.

Results The base case ICER was £13,933 per QALY gained, with a 58.9% chance that RFA was cost-effective at a threshold of £20,000 per QALY gained. The model estimated that implementing RFA would result in reductions in the need for intravenous iron, endoscopies and blood transfusions by 27.1%, 32.3% and 36.5% respectively. Compared to APC, RFA was associated with an estimated 36.7% fewer procedures as well as less time in severe health states (1.77 years) and more time in mild health states (1.2 years) when treated with RFA over a 20-year time horizon.

Conclusions These preliminary and novel cost-effectiveness data indicate RFA treatment is likely to be cost-effective for patients with ongoing symptoms of APC-refractory GAVE, and could lead to substantive reductions in health care resource and also have a notable impact on a patient's state of health. As a rare disease, clinical data in this area is limited. Data from ongoing registry studies will support more sophisticated assumptions beyond expert input.

PTH-040 MEDIUM TERM OUTCOMES OF ENDOSCOPIC STRETTA THERAPY IN REFRACTORY GORD- SINGLE CENTER 2-YEAR FOLLOW UP

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Background Stretta[®] offers a therapeutic alternative for patients suffering from refractory gastro-oesophageal reflux disease (GORD). Current evidence suggests the treatment may improve symptoms of GORD and decrease requirement for proton pump inhibitor (PPI) therapy. This is the first UK study to evaluate outcomes after Stretta therapy with 2 year follow up.

Methods Amongst 166 patients undergoing the Stretta therapy since 2014, we assessed outcomes of 50 patients where follow up was available for at least 24 months (October 2014 and February 2016) in a UK tertiary referral centre. All were assessed for suitability using endoscopy; contrast studies; and pH and manometry studies. Data was held in accordance with The Data Protection Act 1998. The Gastro-oesophageal Reflux Disease-Health Related Quality of Life (GERD-HRQL) was utilized to evaluate symptoms pre and post treatment. Patients were followed up by outpatient clinic appointment and telephone consultation.

Results Fifty consecutive patients were followed up for a median of 25.3 months [771 days (Range 499–1162)] following Stretta[®]. The mean age of the cohort was 52.3 years (SD 13.9) and the majority were female (70%). Seventy-two percent of patients were taking a proton pump inhibitor and 27.9% were using at least two anti-acid medications at referral. Stretta[®] was carried out under conscious sedation in 69.4% and general anaesthetic in 30.6%. The mean total heartburn scores improved from 21.8 (SD 6.5) to 6.7 (SD 7.5) and regurgitation scores from 20.0 (SD 8.3) to 6.7 (SD 7.7) out of a possible 30 following Stretta[®]. The average GERD-HRQL score improved from 46.2/75 (SD 14.2) compared to 15.2/75 (SD 17.3) Dissatisfaction with GORD as measured in the GERD-HRQL decreased from 100% to 6.2% with 3 patients showing no improvement and two late failures. No complications or readmissions occurred following the procedure.

Conclusion There are currently few effective therapeutic endoscopic procedures to anti-reflux surgery for refractory GORD. This series corroborates the value and safety of Stretta[®] as a viable option for selected patients instead of surgery, more so in those who are unwilling or unable to undergo surgery.

PTH-041 CASE CONTROL STUDY USING A NOVEL BILIARY BRUSH FOR THE DIAGNOSIS OF DISTAL BILIARY OBSTRUCTION

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Introduction Brush cytology is routinely performed during ERCP to assess biliary strictures but is limited by modest sensitivity (45%). Recently a biliary brush with a new design (*Infinity[®] brush - U.S.Endoscopy*) has been introduced and preliminary reports suggest improved sensitivity.¹ The brush is more abrasive and larger than conventional brushes. The aim of our study was to compare the efficacy of the new biliary brush compared with the conventional brush (*RX Cytology Brush - Boston Scientific*) that is routinely used in our unit.

Methods This is a matched case control study. Biliary brushings were performed with the novel brush in 50 consecutive patients from July 2017 to September 2018 for distal biliary obstruction. The cases were matched to 100 consecutive controls of the traditional brush from January 2016 to December 2016. The technique and preparation of the sample was similar for both groups. Cytology grading: C1 – inadequate, C2 = benign, C3 = atypia, C4 – suspicious for malignancy & C5 = diagnostic for malignancy. Demographic data, sensitivity, specificity & negative predictive values (NPV) were analysed for C5 alone and C4 & C5 combined. Final diagnosis was based on a minimum follow up of 6 months. Student t test & Chi square test was used for analysis.

Results The mean age for cases was 65.4 yrs.(SD = 31.4; range = 35–91). The mean age for controls was 66.8 years (SD = 23.5; range = 35–88). M:F ratio = Cases = 26:24 & controls = 48:52. There was no statistically significant difference between the age($p=0.86$ & 0.91) & sex distribution ($p=0.79$ & 0.94) across the two groups.

Cases = 75% had final diagnosis of malignancy. The sensitivity, specificity and NPV for the diagnosis of malignancy using strict criteria i.e. C5 was 49%, 100% & 40% respectively. However if C4 & C5 were combined the values were 75%, 93% 60% respectively.

Controls = 75% had final diagnosis of malignancy. The sensitivity, specificity and NPV for the diagnosis of malignancy using strict criteria i.e. C5 was 52%, 100% & 41% respectively. However if C4 & C5 were combined the values were 71%, 100% & 56% respectively.

The mean follow up for the cases was 9.2 months and 31.7 months for the control group. There was no statistically significant difference in sensitivity ($p=0.92$), specificity ($p=0.79$) & NPV($p=0.09$) between the two brushes.

Conclusions Our data suggest that the novel brush design does not confer improved diagnostic performance in malignant biliary strictures. This highlights the difficulties of intra ductal brush sampling possibly reflecting the paucity of malignant cells within the stricture reflecting the desmoplastic nature of biliary and pancreatic malignancy.

REFERENCE

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