ADTH-04 POST COLONOSCOPY COLORECTAL CANCER IN THE ENGLISH NATIONAL HEALTH SERVICE BOWEL CANCER SCREENING PROGRAMME

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Introduction PCCRC rate is a key quality indicator of colonoscopy. The World Endoscopy Organisation has reached consensus agreement to use one method for calculating 3 year PCCRC rates (termed PCCRC-3 y) to enable benchmarking of rates.¹ This methodology, used previously by Morris et al.², showed a PCCRC-3 y rate of 8.6% across the English National Health Service (NHS) from 2001–2007.² with a rate of 7.3% in 2007. This study aimed to determine the rate of PCCRC-3 y in the English NHS Bowel Cancer Screening Programme (BCSP).

Methods Data from each colonoscopy in the BCSP is entered into a national database, the Bowel Cancer Screening System. All colorectal adenocarcinomas, within and outside the BCSP, are validated and registered by the National Cancer Registration and Analysis Service. This retrospective observational study interrogated these databases to identify those BCSP colonoscopies detecting colorectal cancers within 6 months (true positive colonoscopies) and those BCSP colonoscopies in patients who subsequently developed a colorectal cancer 6 months – 3 years after the colonoscopy (false negatives) between 2006 and 2013.

Abstract ADTH-04 Table 1

Year	True Positive Colonoscopies	False Negative Colonoscopies	To year end	PCCRC-3 y Rate
2006–2008	2288	55	2009–2011	2.34% (95% CI 1.8–3.0)
2009	2303	81	2012	3.40% (95% CI 2.7–4.2)
2010	3180	113	2013	3.43% (95% CI 2.8–4.1)
Total	7771	249		3.10% (95% CI 2.7–3.5)

Of the 249 PCCRCs, 164 were detected at a subsequent BCSP procedure and 85 detected outside the BCSP

Conclusions

1. The overall English NHS BCSP PCCRC-3 y rate from 2006–2010 is 3.1% – less than half the 7.3% PCCRC

rate seen in the symptomatic English NHS for 2007, providing further evidence that high quality colonoscopy, such as that performed by screening-accredited colonoscopists in the BCSP, results in a lower rate of PCCRC.^{3 4}

2. Despite the high quality of colonoscopy in the BCSP, PCCRCs still occur, showing the importance of vigilance during all colonoscopies.
3. Diagnosis of >2000 colorectal cancers (true positive colonoscopies) each year indicates there is an adequate sample size for annual reporting of PCCRC-3 y rate within the BCSP and comparison with PCCRC-3 yr rates in symptomatic services.

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ADTH-05 PERCUTANEOUS TRANSHEPATIC CHOLANGIOSCOPY IN THE TREATMENT OF BILIARY DUCTAL STONES

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Introduction Percutaneous direct cholangioscopy may expand diagnostic and treatment options where endoscopic biliary access is precluded by post-surgical anatomy. We aim to report the utility of percutaneous transhepatic cholangioscopy in patients with intrahepatic stone disease, using the SpyGlass DS cholangioscopy system.

Methods Five patients underwent percutaneous cholangioscopy between July '17 and February '18. All had post-surgical duodenal anatomy and intrahepatic duct (IHD) stones, three with an associated anastomotic stricture. In all cases prior percutaneous transhepatic cholangiography (PTC) and biliary access was achieved using conventional interventional radiology techniques, with the transhepatic tract dilated to 12 F, and a drain left *in situ*.

Results The procedures are summarised in Table 1. Five procedures were performed under general anaesthetic and one with sedation, with the patient supine. All patients received antibiotic prophylaxis. Under sterile conditions the cholangioscope was introduced percutaneously into the intrahepatic biliary tree via a peel-away sheath (12Fr in 5 cases and 11Fr

Abstract ADTH-05 Table 1

Age	M/ F	Indication for cholangioscopy	Reason for Percutaneous approach	Outcome	Complications	Procedure time (including anaesthetic)
54	F	IHD stones	Hepaticojejunostomy with anastomotic stricture	EHL and stone clearance	None	120 mins
52	M	IHD stones	Billroth II	EHL and stone clearance	None	130 mins
75	M	IHD stones	Billroth II	EHL and stone clearance	None	110 mins
71	M	IHD stones	Hepaticojejunostomy with anastomotic stricture	EHL, stone clearance and stricture dilatation	None	44 mins
31	F	IHD stones	Hepaticojejunostomy with anastomotic stricture	No stones seen	None	75 mins

in 1). Optimal stone localisation was achieved using fluoroscopy and direct visualisation, allowing application of electrohydraulic lithotripsy (EHL) using a Boston Scientific EHL probe for stone fragmentation. In one case 8 mm-10 mm sequential dilatation of an anastomotic stricture was performed. In one case a surgical stitch across the anastomosis was visualised – the likely nidus for stone formation. Stone clearance was successful in all cases where IHD stones were identified. In one case the IHD stones had cleared since the index PTC. There were no recorded procedural complications.

Conclusion In this small case series direct visualisation of the biliary tree using percutaneous SpyGlass cholangioscopy was safe, successful and expanded the therapeutic capabilities of PTC. This technique could also be used to enhance the investigation and treatment of post-surgical biliary anastomotic stricturing, where retrograde endoscopic access is not feasible.

ADTH-06 MICROSCOPIC RESIDUAL LESION AFTER APPARENT COMPLETE EMR OF LARGE LESIONS: EVIDENCE FOR MECHANISM OF RECURRENCE

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Introduction Endoscopic mucosal resection (EMR) of large colorectal superficial neoplastic lesions (CSNL) is associated with significant recurrence and the risk of recurrence is significantly higher with piecemeal EMR (pEMR). The mechanism for recurrence has not been proven but has been postulated to occur as a result of microscopic areas of residual adenoma left between areas of sequential snare capture during pEMR. We aimed to determine the incidence of residual microadenoma in apparently normal mucosa left at the margin of the defect following EMR.

Methods Following EMR/pEMR of 31 large CSNL, the base and margin of the resulting defect were examined with magnification chromoendoscopy and NBI/BLI to ensure complete resection. The apparently normal mucosa at the defect margin was then resected using the EndoRotor() device, removing and sampling the full extent of the defect margin. Areas of submucosal fibrosis or diathermy artefact at the base were also sampled if present. Data on the lesion characteristics, resection technique, number of pieces for pEMR, histopathology findings of the lesion and the mucosa at the margin were collected.

Results Mean lesion size was 46.7 mm (range 32 mm-130 mm). Mucosa at the defect margin was sampled in all cases and 100% of the margin was achieved in 28 (90%). Final histopathology of resected lesions was adenoma in 27 (87%), serrated adenoma in 2 (6%) and adenocarcinoma in 2. Microscopic residual lesion was detected in the margin of apparently normal mucosa in 4 cases (13%). In 3 cases this was adenoma with low grade dysplasia and in one case a serrated lesion with no dysplasia was found in at the margin of a resected tubular adenoma. Microscopic residual lesion was detected in the base in 4 cases: 1 was microadenoma, 2 were serrated lesions without dysplasia in the base of resected adenomas and 1 was residual adenocarcinoma. There was no association with pEMR in >3 pieces and residual microscopic lesion or pEMR ≤3 pieces (OR 0.89, 95% CI 0.16-4.8, p=0.89). There were no complications.

Conclusions To our knowledge, this is the first series examining the findings after continuous sampling of the full circumferential margin of apparently normal mucosa left at the defect after EMR of large CSNL. Despite examination with magnification suggesting complete resection, microscopic residual lesion at the margin was present in 13%. This study provides evidence that microscopic residual lesion left after EMR underlies the pathophysiology of recurrence and lends support for techniques that continuously resect or ablate the circumferential margin of the defect to reduce recurrence.

ADTH-07 DEEP LEARNING BASED CLASSIFICATION OF INTRAPAPILLARY CAPILLARY LOOPS FOR DETECTION OF EARLY OESOPHAGEAL SQUAMOUS NEOPLASIA

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Introduction Narrow band imaging with magnification endoscopy (ME-NBI) allows detailed assessment of microvascular patterns within early squamous cell neoplasia (ESCN). The Japanese Endoscopy Society (JES) AB classification describes ESCN and predicts invasion depth based on the intrapapillary capillary loop (IPCL) pattern. Early lesions are amenable to endoscopic therapy (EET). We have designed a novel deep convolutional network (CNN) able to classify IPCL patterns as normal (A) or abnormal (B1/B2/B3), in order to alert endoscopists to abnormal areas in ESCN during lesion assessment.

Methods 17 patients were recruited at a referral centre in Taiwan. Endoscopies were performed using ME-NBI (Olympus). IPCLs were classified for each video by 2 experts as normal (type A), or abnormal (type B1/B2/B3), using the JES classification. Matched tissue was obtained by ESD for histologic evaluation of invasion depth. Images were quality controlled to remove uninformative (blurred) images. Our full dataset consisted of 7046 images. A CNN was developed with five-fold cross validation. On average, each fold used 3962 images for training, and 1637 unseen images (846 normal and 791 abnormal) for testing. Accuracy, F1 scores, sensitivity and specificity for abnormal IPCL detection were calculated.

Results 17 patients were included (10 had early neoplasia [1 high grade intra-epithelial neoplasia (HGIN) 4 carcinoma *in situ* (CIS) invading to the lamina propria, 4 to the muscularis mucosa and 1 to the submucosa] and 7 were normal). Our algorithm operates at video rate and had an accuracy for differentiating abnormal IPCL patterns (type B1, B2, B3) from normal (type A) of 93.69%. The average F1 score for identifying abnormal areas of ESCN based on IPCL classification was similarly high at 92.2%. Our network also achieved a sensitivity and specificity for abnormal IPCL detection of 89.3% and 98% respectively.

Conclusion We introduce a novel application of deep learning by developing a real-time CNN, with promising results in classifying squamous mucosa as normal or neoplastic based on the JES IPCL classification. Our system demonstrates impressive accuracy, sensitivity and specificity for differentiating type A from type B1/2/3 IPCLs. Further work is underway to develop a multiclass classifier to distinguish between the