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