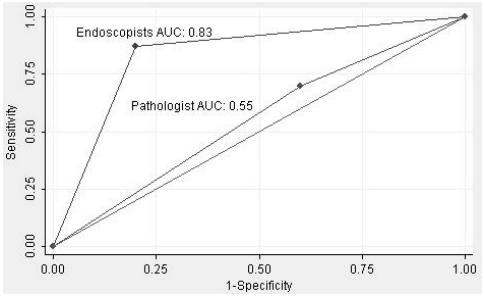
vs. 60.6% (p=0.0003), respectively. Also, the area under the ROC curve (AUC) was greater for endoscopists than pathologist (0.83 vs. 0.55, p=0.0001) (figure). While the overall agreement between endoscopists and pathologist was moderate for all GI lesions (kappa coefficient [k] = 0.43; 95% CI, 0.26 - 0.61), luminal lesions (k = 0.40; 95% CI, 0.20 - 0.60) and those of dysplastic/neoplastic pathology (k = 0.55; 95% CI, 0.37 - 0.72), the agreement was poor for benign (k = 0.13; 95% CI, -0.097 - 0.36) and pancreaticobiliary lesions (k = 0.19; 95% CI, -0.26 - 0.63). Conclusion: There is a wide discrepancy in the interpretation of p-CLE findings between endoscopists and pathologist, particularly for benign and pancreaticobiliary lesions. Given these findings, further studies are needed to identify the cause of this poor agreement.



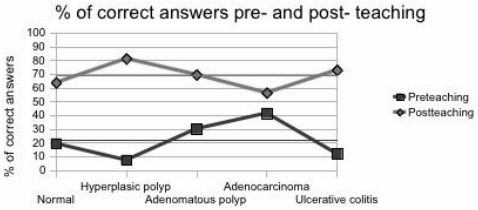
Receiver Operating Characteristic (ROC) curves for endoscopists and pathologist for diagnosis of dysplastic/neoplastic lesions using p-CLE

Sa1838

Learning Curve Analysis of pCLE in Colonic Diseases in a Community of 54 Gastroenterologists

Emmanuel Coron, Frederic Prat

Background and aim: Probe-based confocal laser endomicroscopy (pCLE) has a high accuracy for discrimination between various colorectal tissues. Previous studies demonstrated short learning curve among endoscopists in expert centers (1,2). However, this parameter has not been assessed in larger gastroenterology community. Therefore, the aim of our prospective study was to determine the learning curve of pCLE for the diagnosis of colorectal diseases before and after a single training session in a community of non- pCLE expert endoscopists. Methods: 10 pCLE videosequences of the colorectum obtained in 10 patients were retrieved. These sequences corresponded to normal mucosa (n=2), hyperplasic polyps (n=1), adenomas (n=3), adenocarcinomas (n=2) and ulcerative colitis (n=2) in a randomized order. An audience of 54 clinicians naive in pCLE interpretation (35 residents and 19 gastroenterologists in private practice) made a presumptive diagnosis (normal/hyperplastic/adenoma/adenocarcinoma/ulcerative colitis) on each videosequence. Then, readers followed an interactive training session with two expert readers (EC, FP) focused on teaching the colorectum patterns in normal and diseased conditions. Subsequently, readers reviewed the 10 same sequences, in a second randomized order and made a second presumptive diagnosis. Results: The results were analyzed considering the percentage of correct answers before (preteaching) and after (postteaching) the training session. The mean accuracy results for the whole group went up from 24% to 68% (23% to 69% for interns, 28% to 57% for private practice physicians) demonstrating a significant improvement in pCLE image interpretation even after a very preliminary training. The most significant improvement post teaching was observed for the interpretation of hyperplastic (7% to 81% accuracy) and ulcerative colitis (12% to 73% accuracy) sequences, whereas the smallest improvement was observed for cancerous sequences (42% to 56%). Conclusions: Interpretation of pCLE images might improve very rapidly after a structured training and review of standardized images. Provided these results are confirmed on larger sets of videosequences, pCLE interpretation of colonic disorders might be easily learned by non-expert gastroenterologists.



Sa1839

Spectral Imaging of Neoplasms of the Colon by Targeting Tryptophan, FAD and Collagen

Bhaskar Banerjee, Timothy Renkoski, Hemanth Gavini, Logan R. Graves, Vassiliki L. Tsikitis, Nathaniel S. Rial, Urs Utzinger

Introduction: Non-polypoid colorectal neoplasms are both prevalent and easily missed during colonoscopy and may account for incident cancers. A real-time optical technique that utilizes molecular and structural changes to generate high contrast images of neoplasms without the need for exogenous contrast agents is presented. Background and methods: We have previously shown that fluorescence from tryptophan is increased in cancerous cells compared to normal cells of the colon. We have developed a prototype hyperspectral camera that is sensitive for short wavelength macroscopic imaging of tissue and is able to image fluorescence from selected molecules. Illumination at 280 nm, 320 nm and 440 nm were used to image fluorescence from tryptophan, collagen and flavin adenine dinucleotide (FAD) respectively. Fresh surgical specimens of the human colon containing adenocarcinoma and adenomatous polyps (n=8) were imaged within 30 minutes of resection. The raw images were corrected for background light, flat-field, absorption and source power fluctuation. Results: Individual raw images of tryptophan fluorescence did not consistently distinguish neoplasms from the surrounding normal mucosa, however images with very high contrast were obtained when the intensity of fluorescence from tryptophan was divided by the product of FAD and collagen fluorescence. An example of the high contrast achieved is provided in Figure 1. Conclusions: Tryptophan fluorescence, the intensity of which is greater in cancerous cells than in normal cells is not always increased in neoplasms due the absorption of the emitted fluorescence by tissue hemoglobin. In contrast to tryptophan, FAD fluorescence is decreased in metabolically active cancerous cells and collagen fluorescence is also decreased due to displacement and interruption of the basement membrane by the neoplastic process. The fluorescence ratio of Tryptophan/FAD*Collagen utilizes these differences to maximize tumor image intensity relative to the normal mucosa to produce high contrast images. The technique can be incorporated into endoscopes for real-time imaging.

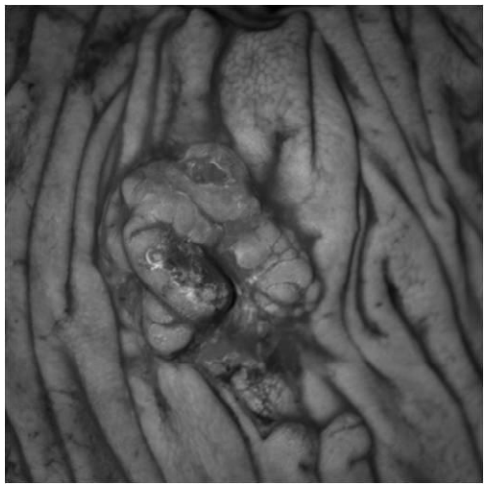


Figure 1a. A grayscale tryptophan fluorescence image showing a 2 cm diameter adenocarcinoma of the colon.

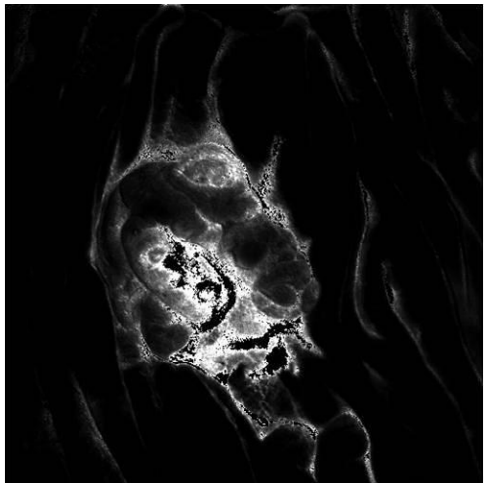


Figure 1b. Tryptophan fluorescence image divided by the product of FAD and collagen fluorescence to generate a high contrast grayscale image of the tumor.

Sa1840

Assessment of Portal Hypertensive Enteropathy (PHE) Using Probe-Based Confocal Laser Endomicroscopy (pCLE)

Eladio Rodriguez-Diaz, Gyorgy Baffy, Marcos C. Pedrosa, Pushpak Taunk, Sun-Chuan Dai, Satish K. Singh

Background: There is increasing interest in the early detection of portal hypertension (PHT) in an attempt to prevent morbidity associated with late-stage cirrhosis. In addition, there are potentially-reversible conditions (e.g., NAFLD, alcoholic hepatitis) where early biomarkers may help stratify disease severity and modify outcomes. Advances in small bowel endoscopy have revealed that PHE may be more prevalent than previously understood. **Aim:** To evaluate the utility of quantitative pCLE for assessing microvascular and morphological changes associated with PHT in the small intestine. **Methods:** With IRB approval, we enrolled patients with and without PHT scheduled for upper endoscopy at VA Boston. Upon IV injection of 2 ml of 10% sodium fluorescein, real-time endomicroscopy and video microangiography was performed within imaged duodenal villi using pCLE (Mauna Kea Technologies, Newtown, PA). The pCLE mini-probe employed (GastroFlex-UHD™) provides 1000x magnification, 20 µm optical slice thickness, 1µm lateral resolution, and a 240µm field of view.