

Defining the Extension of an Ampullary Lesion *in vivo*, Using probebased Confocal Laser Endomicroscopy (pCLE)

Case Study

Dr. Amrita Sethi, Columbia-Presbyterian University Medical Center, New York, NY, USA

1. Technology Review

Probe-based Confocal Laser Endomicroscopy (pCLE) is a new method which provides microscopic views of the mucosa. Images are obtained by scanning the mucosal surface with a low power laser light that is passed through a fiber optic bundle. This technology makes it possible to image individual cells and tissue architecture, allowing the endoscopist to make a diagnostic assessment of the histology real-time, *in vivo*.

2. Case Report

A 77 year old man was referred to Columbia University Medical Center for possible resection of a large ampullary lesion seen on prior endoscopy. Prior biopsies were negative for malignancy. In the interim, the patient developed jaundice. An Endoscopic Retrograde CholangioPancreatography (ERCP) was performed for biliary decompression and possible ampullectomy.

Due to the size and complexity of the lesion (figure 1), EsoGastroDuodenoscopy (EGD) with pCLE was performed in order to further characterize the nature of the lesion, in real time, prior to ampullectomy. pCLE imaging was performed immediately after injection of I.V. fluorescein 10% by inserting the GastroFlex[™] UHD Confocal Miniprobe[™] into the working channel of the duodenoscope. The probe was then positioned directly on the lesion. pCLE imaging demonstrated criteria highly correlated with malignancy such as dark, irregular borders where the cells cannot be distinguished. Based on these findings, a real-time diagnosis of malignancy was suggested, which was later confirmed by the histopathological analysis. The ampullectomy was aborted and biliary stents were placed.

A second ERCP was performed using pCLE in order to evaluate a possible intra-ductal invasion of malignancy as a distal Common Bile Duct (CBD) stricture had been seen on cholangiogram. For this procedure, the CholangioFlex[™] probe was passed through the working channel of the single operator cholangioscope and I.V. injection of fluorescein 10% was given. The probe was positioned at the distal part of the common bile duct where the stricture could be visualized enabling identification of criteria highly suggestive of malignancy: thick white bands (> 20 microns) and presence of epithelium (figures 2, 3). Biopsies taken from this area confirmed high grade dysplasia. Based on these pCLE findings, the patient was scheduled for a curative surgical resection.

3. Summary

pCLE enabled to assess in real time the severity of neoplasm of the ampullary lesion and the extent of the lesion. The additional information provided by pCLE imaging during the procedures helped redirect the treatment strategy during endoscopy.



figure 1: endoscoic view of the lesion



figure 2



figure 3

figure 2 and 3: pCLE image of ductal invasion of the lesion (malignant pattern), acquired with a CholangioFlex[™] Confocal Miniprobe[™].