

Imaging Of Pancreatic Cystic Lesions With Confocal Laser Endomicroscopy: An Ex Vivo Pilot Study

A. Kadayifci* ^{1,2}, M. Atar², M. Yang³, C. Fernandez-del Castillo⁴, M. Mino-Kenudson³,
W. R. Brugge²

¹Gastroenterology, University of Gaziantep, Gaziantep, Turkey

²Gastroenterology, ³Pathology, ⁴Surgery, Mass General Hospital, Harvard Medical School, Boston,
United States

Introduction: The differential diagnosis of pancreatic cystic lesions (PCLs) is an increasingly common clinical challenge. A needle based confocal laser endomicroscopy probe (nCLE, Cellvisio, Mauna Kea) through a 19G needle has been shown to be helpful for differential diagnosis of PCLs by imaging the cyst wall during endoscopic ultrasound-fine needle aspiration. However, clinical experience is still limited, and better image definition and characterization of the cyst wall from different lesions are needed.

Aims & Methods: The aim of this pilot study was to develop a reference standard in CLE characterization of various types of PCLs. Patients who underwent surgery of a PCL were enrolled to study if they gave their consent. During surgery, intravenous fluorescein (2.5 ml of 10%) was injected just prior to the ligation of blood vessels supplying the pancreas. The injected fluorescein was expected to retain for at least an hour after the injection. The freshly specimens were transected along the long axis to fully expose the luminal surface. A Gastroflex-UHD CLE probe (pCLE) was used manually to acquire images directly from the surface of the cyst wall. The cyst walls were screened longitudinally in 2 millimeter ranges by the tip of the probe and sequences recorded for a total 15 minutes. The entire resected specimen subsequently underwent cross sectional histology. All recorded data were analyzed by two investigators for predefined and original image findings of PCLs.

Results: During the 4 months study period, 10 cases (4 male and 6 female) were recruited into the study. The median age of the patients was 77 (range, 33-88). All patients underwent surgery because of a mucinous cyst with worrisome features or a symptomatic PCL. The median duration between fluorescein injection and confocal imaging was 55 minutes (range, 40-90). Imaging was successful in all patients, and various papillary projections with a vascular core and mucinous epithelial borders were visualized in 8 of the patients. In 2 patients, typical vascular network were visualized without papillary structures. The conventional pathological examination confirmed 6 cases with Intraductal Papillary Mucinous Neoplasm (IPMN), 2 cases with Mucinous Cystic Neoplasm (MCN) and 2 cases with serous cysts. Pancreatic ductal adenocarcinoma arising in high grade dysplasia was found in one patient, and high grade dysplasia in 2 patients. The sensitivity and specificity of ex-vivo confocal imaging to demonstrate papillary structures was 100%.

Conclusion: Pancreatic cyst epithelial wall can be visualized successfully by pCLE in ex vivo surgical specimens. Various papillary projections have been seen in all cases of IPMN and MCN in this examination. The variety of images which have been acquired in this model will be helpful for the definition of similar structures during in vivo examination of pancreatic cysts. To develop a reference standard for definition of IPMN subtypes and for grade of differentiation would be the ultimate aim of this model.

Keywords: Confocal endoscopy, pancreas cysts, IPMN