

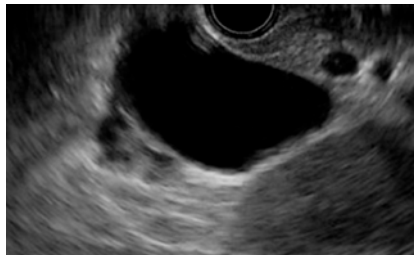
## Needle-based confocal laser endomicroscopy for cystic lymphangiomas of the pancreas: the first case series



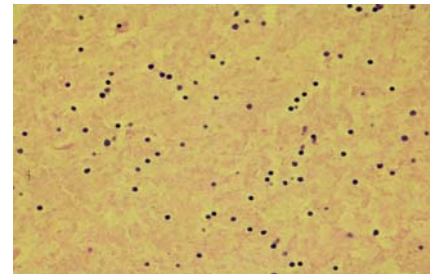
Cystic lymphangiomas of the pancreas (CLP) were first described by Koch in 1913 [1]. The origin of these benign lesions is not well defined; they could either be congenital malformations or secondary to a lymphatic vessel obstruction due to either radiotherapy, surgery, infection, or trauma [2]. The main challenge in pancreatic cystic lesions (PCLs) is the diagnostic certainty [3]. Needle-based confocal laser endomicroscopy (nCLE), described in pancreatic diseases in 2011 [4], is a very specific technique for the diagnosis of the main PCL [5]. The first description of the identifiable structures by nCLE in CLP is proposed below.

All cases of CLP seen between 2012 and 2020 in our center were reviewed. The study was approved by the institutional ethics committee (IRB00010835). Gold standard criterion for CLP diagnosis was cytology with or without histology. Herein, we report on six patients who all had endoscopic ultrasound imaging of the pancreatic cyst (► Fig. 1), cytology compatible with CLP showing small lymphocytes (► Fig. 2), with or without histologic confirmation on the surgical specimen (n = 3).

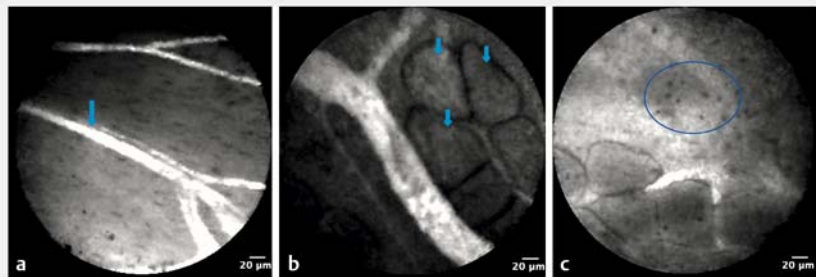
During nCLE, the main structure identified was vessels, qualified as “straight” in five patients (83.3%) and “winding” in one (16.7%), which were on a grey background in all patients (► Fig. 3 a). The second structure was adipocytes, seen in four patients (66.7%) (► Fig. 3 b). Finally, all patients had small, disseminated cells on the grey background, suggesting small lymphocytes (► Fig. 3 c). To the best of our knowledge, this is the first case series describing nCLE characteristics in CLP; nCLE identified three main structures: rather large and straight vessels on a grey background, adipocytes, and small disseminated cells (► Video 1). When these signs are present, combined with the absence of the usual criteria for the most common



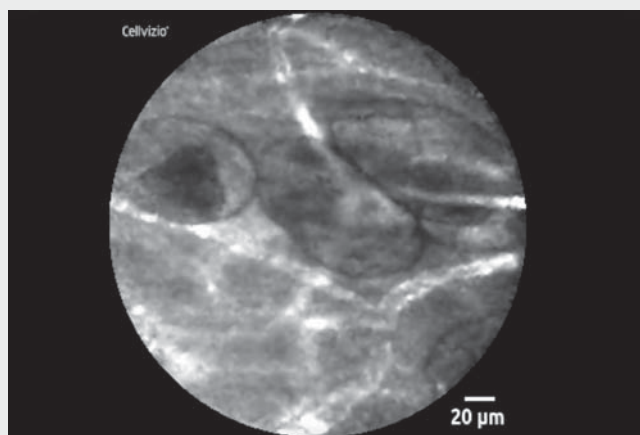
► Fig. 1 Endoscopic ultrasound image of a cystic lymphangioma of the pancreas located in the body of the pancreas.



► Fig. 2 Cytology obtained by endoscopic ultrasound-guided fine-needle aspiration.



► Fig. 3 Needle-based confocal laser endomicroscopy. a Straight vessels on grey background (arrow). b Adipocytes (arrows). c Small disseminated cells, suggesting small lymphocytes (circle).



► Video 1 Needle-based confocal laser endomicroscopy recording of a cystic pancreatic lymphangioma depicting adipocytes, straight vessels on grey background and small disseminated cells.

PCLs, the diagnosis of CLP should be considered.

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## Competing interests

B. Napoléon performs teaching sessions for Mauna Kea Technologies. C. Michoud, T. Khoury, A. Lisotti, R. Gincul, S. Leblanc, and A. I. Lemaistre declare that they have no conflict of interest.

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