

***In vivo* endomicroscopy of donor duodenum improves early detection of pancreas rejection in a recipient of simultaneous duodenum-drained pancreas-kidney transplantation: a case report**

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Abstract

Confocal laser endomicroscopy (CLE) is a new technique, which allows subsurface histological diagnosis at a cellular and subcellular level in vivo and could provide histological diagnosis during endoscopic examination. Up to now histological examination of the tissue sample is the only definitive way of diagnosis and monitoring organ rejection after transplantation. In case of pancreas transplantation percutaneous pancreas biopsy under imaging control is still the method of choice for obtaining tissue samples. However in 73% of biopsy attempts, it was shown that the duodenal histology predicts the initial diagnosis of rejection of the pancreas, usefulness of transplanted duodenum biopsies for graft rejection monitoring was also described. The histology technique is time consuming, and the therapeutic decision could not be made quickly, in spite of clinical necessity. In this paper we described feasibility of visualization and biopsy of donor duodenum and detection of microscopic changes in 2 cases of transplanted duodenum, expressed as destruction of the villi and dispersed goblet cells in comparison to a microscopic view of their own healthy duodenum. No or only small, endoscopically non-significant macroscopic changes in transplanted duodenum in those patients were observed. In both cases, the histological examination confirmed acute organ rejection. We demonstrated for the first time that CLE is promising and effective method to detect acute phase of organ rejection and also for follow up in those patients.

Key words: endomicroscopy, pancreas transplantation, pancreas rejection.

Introduction

Endoscopy of the digestive tract has been evolving from primary diagnostic to extensive diagnostic and

therapeutic modalities with a great impact on the management of gastrointestinal pathologies [1–3]. Novel imaging technologies including virtual colonoscopy or computed tomography/magnetic reso-

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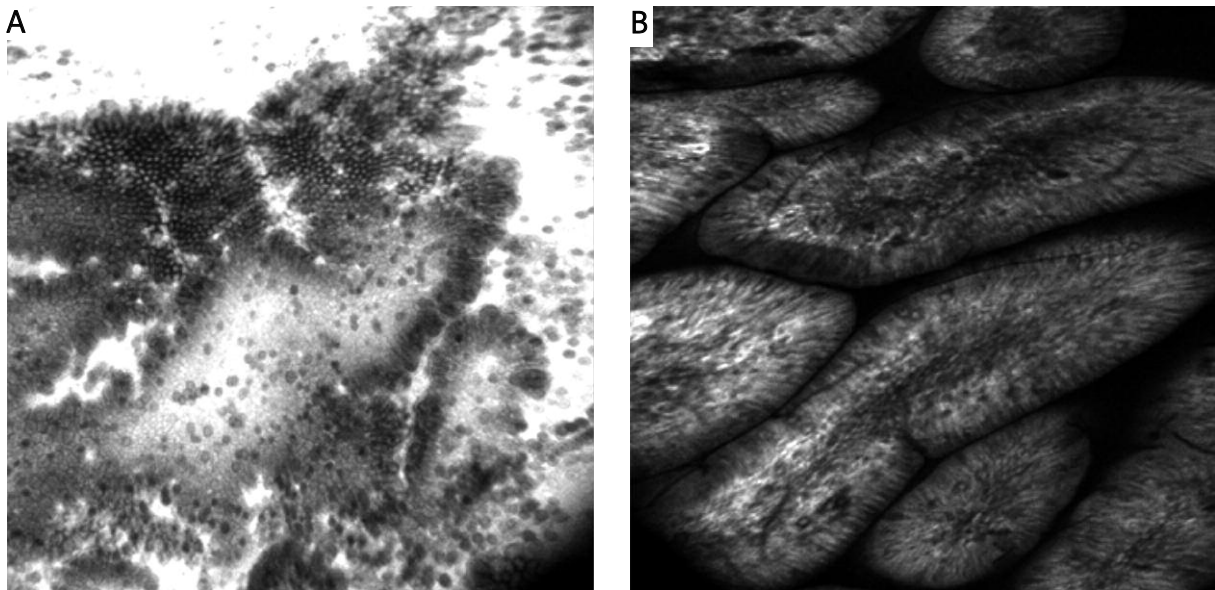


Photo 1. Endomicroscopic picture of transplanted duodenum (**A** – clinical and histopathological rejection, **B** – normal picture of transplanted duodenum)

nance (CT/MR) colonography, CT or magnetic resonance imaging (MRI) enterography and capsule endoscopy have also been developed and are of clinical importance [4, 5]. Minimally invasive therapeutic methods including natural orifice transluminal endoscopic surgery cholecystectomy (NOTES) [6], or endoscopic retrograde cholangiopancreatography (ERCP) in resolution of bile duct obstruction [7] are also safe and effective for selected patients. Magnifying endoscopy with different chromoendoscopy techniques and novel endoscopic imaging as confocal endomicroscopy has become essential for determining and monitoring different pathologies in the digestive tract [1, 8].

Confocal laser endomicroscopy (CLE) is a new, powerful technique, which allows subsurface histological diagnosis at a cellular and subcellular level *in vivo*, and could provide histological diagnosis *in vivo* during endoscopic examination [1, 2]. This technology is widely investigated in different gastrointestinal diseases and becomes an alternative to conventional histology. The power of endomicroscopy in screening and surveillance colonoscopy, ulcerative colitis, Barrett's esophagus, and gastric cancer have been demonstrated in recent studies [1, 8]. For some gastrointestinal malignancies, a rapid *in vivo* diagnosis of early cancer or premalignant lesions is highly important for successful therapy. The endomicroscopy is a safe procedure, complications are rare, comparable to conventional endoscopy.

Up to now histologic examination of the tissue sample is the only definitive way of diagnosing and monitoring pancreatic rejection. Percutaneous pancreas biopsy under imaging control is still the method of choice for obtaining tissue samples. Adequate samples are obtained in this invasive method, however, in 73–89% of biopsy attempts, it was shown that the duodenal histology predicts the initial diagnosis of rejection of the pancreas, being less accurate for monitoring recovery from rejection. It was also reported that the rejection process might occur independently in either organ [8–10]. We described also usefulness of transplanted duodenum biopsies for graft rejection monitoring [11]. However, the histology technique is time consuming, and the therapeutic decision could not be made quickly, in spite of clinical necessity.

Case report

Therefore, an endomicroscopic approach to detect *in vivo* histological picture of transplanted duodenum might be of clinical importance in detection and monitoring of acute pancreas rejection, and its influence on a potential clinical decision.

During the first 2 weeks after simultaneous duodenal-drained pancreas-kidney transplantation (SPK) procedure for type 1 diabetes mellitus, 18 patients were examined with CLE technique. No difficulties to

reach anastomosis with CLE were observed. Endoscopy was technically simple and not time consuming. Histological biopsies from transplanted and own duodenum were also taken for confirmation of *in vivo* observations. There were no complications associated with endoscopy, or downloading material for histological examination. All procedures were performed under general anesthesia.

In the group of 18 patients after SPK transplantation, we found in 2 cases microscopic changes in transplanted duodenum, expressed as destruction of the villi and dispersed goblet cells in comparison to a microscopic view of their own healthy duodenum (Photo 1). No or only small, endoscopically non-significant macroscopic changes in transplanted duodenum in those patients were observed. In both cases, the histological examination confirmed acute organ rejection.

Conclusions

Confocal endomicroscopy is a developing area of gastrointestinal endoscopy with expanding clinical and research applications. In our pilot study, we demonstrated for the first time that CLE is a promising and effective method to detect acute phase graft-versus-host disease and also for follow up in those patients. To our knowledge, up till now there have been no reports on the use of this technique in recipients of pancreas transplant.

The procedure is easily acceptable and safe for patients and the clinical decision based on the information obtained after examination could be made quickly, what seems to be of high importance in transplantology [11–14]. Further studies are needed to confirm clinical usefulness of this technique in monitoring of patients after SPK transplantation.

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