In vivo detection of mucosal healing-involved histiocytes by confocal laser endomicroscopy

Gheorghe Hundorfean, Abbas Agaimy, Mircea T Chiriac, Walter Geißdörfer, Jochen Wacker, Markus F Neurath, Jonas Mudter

Abstract

Histiocytes have a pivotal role in wound repair and intestinal epithelial recovery - the most important goal to sustain gut functionality. Yet, an in vivo description of colonic histiocytes by confocal laser endomicroscopy (CLE) is missing. Here, we report the case of a 45-year-old male patient who was referred to our clinic with weight loss and a history of two consecutive Clostridium difficile colitis episodes, the latter cured 3 wk before present admission. Stool microbiology was negative. Conventional colonoscopy showed atrophy and a light mucosal oedema in the distal colon. During on-going endoscopy, we performed a fluorescein-aided CLE which revealed large polygonal (histiocytes-like) cells with copious cytoplasm and large nuclei in the lamina propria of the sigmoid colon as well as regenerative epithelial changes. Histopathological assessment of biopsies from the same areas confirmed the endomicroscopical findings: Periodic acid–Schiff- and CD68-positive foamy histiocytes in the colonic lamina propria and an advanced epithelial recovery. Since stool microbiology was repeatedly negative and polymerase chain reaction-analysis from colonic biopsies could not detect any mRNA for Thropheryma whippleii and common pathogens, we interpreted this particular setting as a mucosal healing process after consecutive Clostridium difficile infections. In conclusion, by describing these colonic histiocytes, we highlight the clinical usefulness of CLE in describing the entity of histiocytes in vivo and in real-time during the process of post-infectious mucosal healing in the colon.

Key words: Endomicroscopy; Mucosal healing; Advanced colonic imaging; Colonic histiocytes

Peer reviewers: Dr. Xiaoyun Liao, Department of Medical Oncology, Dana-Farber Cancer Institute, 450 Brookline Avenue, Room JF-208E, Boston, MA 02215, United States; Sam B Ho, MD, Gastroenterology Section 111D, VA San Diego Healthcare System, 3350 La Jolla Village Drive, San Diego, CA 92161, United States

Hundorfean G, Agaimy A, Chiriac MT, Geißdörfer W, Wacker J, Neurath MF, Mudter J. In vivo detection of mucosal healing-involved histiocytes by confocal laser endomicroscopy. World J Gastroenterol 2012; 18(32): 4447-4449 Available from: URL: http://www.wjgnet.com/1007-9327/full/v18/i32/4447.htm DOI: http://dx.doi.org/10.3748/wjg.v18.i32.4447

© 2012 Baishideng. All rights reserved.
INTRODUCTION

A subset of macrophages differentiating to histiocytes were proved to have a pivotal role in wound repair processes and intestinal epithelial recovery. This is the most important goal to sustain functionality of the gut and it was also defined as therapeutic goal in order to achieve mucosal healing in chronic inflammatory bowel disease. So far, two reports have described histiocytes in the duodenum using confocal laser endomicroscopy (CLE). Yet, the in vivo description of histiocytes within the colon by confocal endomicroscopy has not been published so far.

CASE REPORT

Here, we report the case of a 45-year-old male patient who was referred to our endoscopy unit with anaemia and weight loss. In the last three months he had a history of 2 consecutive Clostridium difficile (C. difficile) colitis episodes, the latter resolved completely after appropriate treatment 3 wk before the present admission. Microbiological analysis of stool samples was repeatedly negative for C. difficile and other intestinal pathogens (Salmonella, Shigella, Yersinia, Campylobacter). White light colonoscopy showed signs of atrophy, mild mucosal oedema and reduced vascular pattern in the distal colon (Figure 1A). During on-going endoscopy, we performed a fluorescein-aided confocal endomicroscopy of the colonic mucosa which revealed large polygonal (histiocytes-like) cells with copious cytoplasm and large nuclei in the lamina propria of the sigmoid colon (Figure 1B, C). By taking biopsies from the areas analysed by confocal imaging, we were able to correlate and verify the endomicroscopical findings with histopathology. These were Periodic acid-Schiff-positive and CD68-positive foamy histiocytes in the colonic lamina propria between basal mucosal crypts (Figure 2A-C).

DISCUSSION

Since stool microbiology was repeatedly negative and PCR-analysis could not detect any intestinal pathogens (incl. Thropheryma whippelii that causes Whipple’s disease), we interpreted this particular setting as a mucosal healing process after two consecutive C. difficile infections.

In conclusion, by describing these colonic histiocytes in vivo and real-time, we highlight the clinical usefulness of confocal laser endomicroscopy in characterizing the
cell entity of colonic histiocytes and the context of a post-infectious mucosal healing process in the colon, for the first time. Confocal laser endomicroscopy was used previously for the detection of architectural changes, vascularity changes like leakage but not for the differentiation of a specific cell entity. Our report provides the morphological criteria and exemplifies the differentiation and characterization of a particular cell entity, namely the foamy histiocytes, involved in the post-infectious mucosal healing.

In this histopathological and clinical setting, our report is also the first non-invasive and real-time description of human foamy histiocytes in the colon.

REFERENCES

1 Murray PJ, Wynn TA. Protective and pathogenic functions of macrophage subsets. Nat Rev Immunol 2011; 11: 723-737

2 Colombel JF, Rutgeerts P, Reinisch W, Esser D, Wang Y, Lang Y, Marano CW, Strauss R, Oddens BJ, Feagan BG, Hanauer SB, Lichtenstein GR, Present D, Sands BE, Sandborn WJ. Early mucosal healing with infliximab is associated with improved long-term clinical outcomes in ulcerative colitis. Gastroenterology 2011; 141: 1194-1201

3 Zambelli A, Villanacci V, Buscarini E, Albarello L, Viardi L, di Stefano O, Bassotti G. Confocal endomicroscopic aspects in Whipple’s disease. Gastrointest Endosc 2008; 68: 373-374; discussion 374

4 Dolak W, Leitner J, Maresch J, Wrba F, Mueller C. In vivo identification by confocal laser endoscopy of foamy macrophages associated with Whipple’s disease. Endoscopy 2010; 42 Suppl 2: E310-E311

5 Neumann H, Kiesslich R, Wallace MB, Neurath MF. Confocal laser endomicroscopy: technical advances and clinical applications. Gastroenterology 2010; 139: 388-392, 392.e1-2

6 Bejarano PA, Aranda-Michel J, Fenoglio-Preiser C. Histochemical and immunohistochemical characterization of foamy histiocytes (muciphages and xanthelasma) of the rectum. Am J Surg Pathol 2000; 24: 1009-1015

S- Editor Cheng JX  L- Editor A  E- Editor Zhang DN