CONFOCAL LASER ENDOMICROSCOPY FOR THE DETECTION OF MUCOSAL CHANGES IN ILEAL POUCH AFTER RESTORATIVE PROCTOCOLECTOMY

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BACKGROUND AND AIMS

Confocal laser endomicroscopy is a novel technique to analyze living cells during ongoing endoscopy.

Total proctocolectomy with ileal pouch anal anastomosis is the surgical procedure of choice for the management of ulcerative colitis and familial adenomatous polyposis.

Pouchitis, a non-specific inflammation of the ileal reservoir, and dysplasia may affect the pouch after surgery.

The aim of the present study was to assess the suitability of confocal laser endomicroscopy for the in-vivo diagnosis of mucosal changes in the ileal pouch.

METHODS

Video endoscopy and fluorescein-aided endomicroscopy (EC-3870CIFK; Pentax, Tokyo, Japan) were performed in the four quadrants of the proximal, middle and distal parts of the pouch in 18 patients. Any lesions, if present, were also analyzed. Targeted biopsies were taken. Confocal images and histological findings were analyzed for the presence of villous atrophy, inflammation, ulceration, colonic metaplasia and dysplasia. At endomicroscopy these parameters were defined according to a new Pouchitis Confocal Endomicroscopy Scale (see Table). Considering the presence of abnormalities in at least one of the above parameters in at least one of the confocal image/biopsy from the reservoir, sensitivity, specificity, positive and negative predictive values, and accuracy rates were calculated for the prediction of morphological changes of the pouch.

POUCHITIS CONFOCAL ENDOMICROSCOPY SCALE

Parameters	Confocal diagnosis	Interpretation	Image examples
Villous atrophy	Absent	Before surgery, villi appear regular, finger- and leaf-like. They are packed very densely, almost "sticking" to each other. Enterocyte brush border is well defined. The surface shows many transversal furrows with numerous goblet cells between enterocytes (black spots within the epithelial layer). Normal ileal pouch villi present the same characteristics but are less densely packed with fewer transversal furrows.	
	Mild	Villi are folded and irregular in shape. Increased space between villi is recognized. The enterocyte brush border is not well defined. The surface is almost smooth. Goblet cells are depleted.	
	Severe	Devoid of villi with collars of enterocytes around crypt openings.	
Colonic Metaplasia	Yes	Presence of like-round shaped colonic crypts.	

Parameters	Confocal diagnosis	Interpretation	Image examples
Inflammation	Absent	Normal presence of inflammatory elements in the lamina propria.	See normal morphology of ileal mucosa
	Mild	Presence of mild/moderate cellular infiltration in the lamina propria and dilated vessel. At endomicroscopy it is not possible to distinguish acute and chronic inflammation.	
	Severe	Severe cellular infiltration with severe reduction of gland component	
Ulceration	Yes	Severe inflammation with superficial ulceration and absence of gland component.	
Dysplasia	Yes	Presence of irregular cell architecture with little or no mucin and black irregular cells.	

RESULTS

Endoscopic appearance

11 normal
5 mild pouchitis
2 severe pouchitis

Correlation between confocal images and histology

Parameters		Confocal	Histology
Villous atrophy	Absent	3	3
	Mild	11	8
	Severe	4	7
Inflammation	Absent	5	1
	Mild	10	11
	Severe	3	6
Ulceration	No	15	12
	Yes	3	6
Colonic Metaplasia	No	6	3
	Yes	12	15
Dysplasia	No	18	18

Presence of morphological abnormalities of the pouch

		Histology		
		No	Yes	Total
Confocal	No	1	1	2
	Yes	0	16	16
Total		1	17	18

		IC-95%
Sensibility	94.1	73.0-99.0
Specificity	100.0	20.7-100.0
PPV	100.0	80.6-100.0
NPV	50.0	9.5-90.5
Accuracy	94.4	74.2-99.0

CONCLUSIONS

On the basis of these preliminary results, the presence of morphological changes of the pouch could be predicted with an accuracy of 94,4%.

Endomicroscopy may be helpful in evaluating the ileal reservoir after restorative proctocolectomy and may lead to a significant improvement in the in-vivo surveillance of the pouch.

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