IJAE
Vol. 118, n. 2 (Supplement): 108, 2013
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

# Fibrotic remodeling of colonic *tunica muscularis* is associated with vascular network activation in ulcerative colitis

Ippolito C.[1], Segnani C.[1], Buccianti P.[2], Errede M.[3], Virgintino D.[3], Dolfi A.[1] and Bernardini N.[1]

[1] Unit of Histology and Human Embryology, Department of Clinical and Experimental Medicine, University of Pisa
[2] Department of Gastroenterology and Infective Diseases, University of Pisa
[3] Department of Basic Medical Sciences, Neurosciences and Sensory Organs, University of Bari

Intestinal fibrosis in inflammatory bowel disease is a dynamic, multifactorial process, which involve multiple cell types and interconnected events [1]. Angiogenesis is a hallmark of active gut disease and closely related to fibrogenetic processes. Endothelial cells and pericytes of neovessels have been found to be able to differentiate into fibroblasts and can be considered good candidates for fibrogenesis also in the intestinal tract [2]. This study was aimed to study whether the fibrotic processes occurring within the *tunica muscularis* of UC patients are associated with vascular remodeling.

Full-thickness left colonic samples were obtained from patients with established, severe and pharmacologically unresponsive UC, who underwent bowel resection. Routine histology, histochemistry and immunohistochemistry were conducted in paraffin cross-sections. Collagen and elastic fiber distribution was evaluated within the *tunica muscularis* by both histochemical and immunohistochemical assays. The vascular network pattern was analyzed by revealing the expression of CD31, CD105 and nestin by immunofluorescence applied to laser confocal microscopy.

A significant increase in collagen fibers and a decrease in elastin content were detected in the *tonaca muscularis* of UC inflamed colon, as compared with controls. In particular, enhanced collagen deposition were found at level of the longitudinal muscle and circular muscle layer, and in perivascular spaces. By contrast, elastic fiber pattern was significantly decreased throughout the whole muscle compartment. Increased blood vessel density was observed in the colonic *tunica muscularis* of UC samples compared with samples from healthy control individuals. In particular, the neovessels of inflamed colon showed the activation of both endothelial cells and pericytes, which overexpressed CD105 and nestin, respectively.

A significant vascular remodelling (i.e., angiogenesis, endothelial proliferation and pericyte activation) has been observed in the fibrotic *tunica muscularis* of colon from UC patients. On the basis of the present findings, it is possible to argue that cells of newly formed vessels within the *tunica muscularis* may contribute to the UC-associated fibrosis by cell transition to mesenchymal phenotype.

**References**

[1] Lund K and Zuniga C (2001) Curr Opin Gatroenterol 17: 318-323.
[2] Cromer WE et al. (2011) Curr Opin Gastroenterol 17: 578-593.

Key words

Ulcerative colitis, human, *tunica muscularis*, fibrosis, vascular remodelling.