Fibrocytes contribute to mesenteric manifestations in Crohn's disease.

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Fibrocytes are a precursor cell type, which can differentiate into fibroblasts or adipocytes (1). The mesentery in Crohn's disease, frequently displays disease manifestations such as mesenteric thickening and fat wrapping. This study aimed to investigate the contribution of fibrocytes to mesenteric manifestations in Crohn's disease.

Ethical approval and informed consent were obtained from the HSE Mid-Western Regional Hospital Research Ethics Committee. Mesenteric disease was graded based on presence and extent of factors listed in Table 1. Circulating and mesenteric fibrocytes were identified and enumerated by flow cytometric and immunohistochemical analysis. Relationships between these mesenteric and systemic manifestations were determined. Data are presented as mean ± standard error. Statistical analyses were performed in SPSSv22.

Circulating fibrocytes were significantly elevated in Crohn's disease (n=25) when compared to healthy controls (n=11) (independent t-test: 7.7 ± 0.97% vs. 2.1 ± 0.34%; $p<0.001$). Furthermore, Crohn's disease mesentery displayed a higher number of myofibrocytes than normal tissue. Mesenteric disease activity index directly correlated with the systemic disease manifestations (Pearson's correlation coefficient: $r=0.80$; $p<0.05$).

The increase in fibrocytes is directly related to the extent of mesenteric disease.

Table 1: Scoring system for mesenteric disease manifestations.

Mesenteric Disease Activity Index				
Description	**Severity**	**Grade**	**Stage**	**Score**
FW minimal, MT minimal	Early	Mild	One	1
FW <25%, MT adipovascular pedicle only	Intermediate I	Moderate	Two A	2
FW <25%, pan-mesenteric MT	Intermediate II	Moderate	Two B	4
FW >25%, pan-mesenteric MT	Advanced	Severe	Three	6

References

1. Hong KM, Belperio JA, Keane MP, Burdick MD, Strieter RM. Differentiation of Human Circulating Fibrocytes as Mediated by Transforming Growth Factor-β and Peroxisome Proliferator-activated Receptor γ. Journal of Biological Chemistry. 2007;282(31):22910-20.

Conflict of interest
The authors declare that they have no affiliations with or involvement in any organisation or entity with any financial interest or non-finalcial interest in the subject matter or materials discussed in this manuscript.

Disclosures
The authors have nothing to disclose.