

The mesentery in Crohn's disease displays mesenchymal abnormalities.

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Character count with spaces

2415

Background: Recent advances in our understanding of mesenteric anatomy have shown that the mesentery is continuous along the intestinal tract at vascular, lymphatic and connective tissue levels (1). Thus, the mesentery represents a conduit which may propagate disease (2). This study aimed to investigate abnormalities of the mesentery in Crohn's disease (CD) at a histological level.

Methods: Samples of mesentery, intestine and intestinal hilum were resected from cadavers (n=5) and CD patients (n=5). Haematoxylin and eosin light microscopy (LM) and scanning electron microscopy (SEM) were utilised to examine tissues. Diseased tissue was graded as in Table 1. Surface mesothelium and connective tissue septal thickness were assessed in addition to adipocyte number in areas of mild, moderate and severe mesenteric disease. Primary mesenteric fibroblast cultures were developed from CD patients (n=3). Adhesion and proliferation of mesenteric-derived fibroblasts and a human dermal fibroblast cell line were characterised using real-time cell analysis (xCELLigence[®], ACEA Biosystems).

Results: Mesenteric surface mesothelium thickness ($p<0.001$), connective tissue septal thickness ($p<0.001$) and adipocyte number ($p<0.05$) were all increased with respect to CD severity (Table 2). Upon appraisal of the intestinal hilum, normal mesentery displayed a distinct serosa between the mesentery and muscularis externa. In CD, however, this could not be identified. Additionally, mesenteric mesenchymal abnormalities extended into the muscularis externa and deeper mural layers. Mesenteric-derived fibroblasts (n=3) adhered ($p=0.034$) and proliferated (10-30 h, $p=0.001$) faster than a human dermal fibroblast cell line.

Conclusion: As severity of mesenteric disease increased; surface mesothelium and connective tissue septae thickened while adipocyte number increased. Mesenteric-derived fibroblasts adhered and proliferated faster than a fibroblast cell line.

References

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Table 1: Mesenteric disease activity index in CD.

Mesenteric disease score	Severity	Stage	Score
FW minimal, MT minimal	Mild	One	1
FW <25%, MT adipovascular pedicle only	Moderate I	Two A	2
FW <25%, pan-mesenteric MT	Moderate II	Two B	4
FW >25%, pan-mesenteric MT	Severe	Three	6

Table 2: Mesenteric abnormalities in CD.

	Normal	Mesenteric CD		
		<i>Mild</i>	<i>Moderate</i>	<i>Severe</i>
Surface mesothelium (μm)	24 \pm 13.0	62 \pm 16.0	215 \pm 70.0	408 \pm 73.0
Connective tissue septae (μm)	16 \pm 7.0	53 \pm 17.0	101 \pm 21.0	245 \pm 100.0
Adipocytes (<i>cell number per high power field</i>)	23 \pm 6	28 \pm 4.0	37 \pm 7.0	60 \pm 7.0