

Poster 15

Omentum picture: unraveling the enigma of the immune microenvironment in appendicitis scenario

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Abstract

Background: Appendix obstruction triggers inflammation and exaggerated immune responses, leading the omentum, rich in Milky Spots (MS) housing immune cells, to play a vital role in peritoneal immunity. These MS collect antigens and pathogens, inducing immune responses like inflammation, immune tolerance, or fibrosis [1,2]. Their activities, including angiogenesis, stem cell differentiation, and immune responses, are essential for wound healing and infection containment. However, these activities may also promote pathological responses like rapid tumor growth and metastasis [1,3]. Omental MS contribute to tissue homeostasis, aiding tissue repair through the regulation of leukocyte recruitment and activation by specialized stromal fibroblasts and mesothelial cells [1,3,4]. **Objective:** This study aims to semi-quantitatively evaluate leukocyte subpopulations and extracellular matrix composition in omentum samples from three acute appendicitis patients' groups: Group I without peritoneal blockage, Group II with peritoneal blockage, and the control Group III. **Methods:** Histological omentum samples underwent staining techniques with H&E, Trichrome, Orcein, and Reticulin for optical microscopy analysis. **Results:** Observations revealed higher presence of polymorphonuclear cells and/or lymphocytes, increased fibrosis, and abundant extracellular matrix reticular fibers. The control group exhibited minimal polymorphonuclear cells, lymphocytes, or fibrosis, while groups I and II showed increased polymorphonuclear cells, lymphocytes, and reticular fibers. Collagen fibers demonstrated a similar trend, albeit at lower density, while elastic fibers were scarce. These findings indicate a consistent association among the patient groups: while the control group showed low leukocyte counts and minimal fibrosis, groups I and II, characterized by increased fibrosis, demonstrated elevated leukocyte numbers and a greater presence of reticular fibers. **Conclusions:** These findings align with literature, emphasizing the omentum's crucial role in maintaining tissue homeostasis and supporting tissue repair through the regulation of leukocyte recruitment and activation by specialized fibroblastic stromal cells and mesothelial cells [3,4]. Further studies characterizing the omentum microenvironment are essential for identifying response predictive biomarkers.

Keywords: milky spots; immune cells; peritoneal cavity; histochemical techniques

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