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EARLY VASCULAR AND STROMAL FEATURES OF GRANULATION TISSUE DURING LOCAL GEL TREATMENT OF EXPERIMENTAL PERITONITIS

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Abstract. The early organization of reparative tissue was examined through a focused qualitative analysis of morphological descriptions from a single 72-rat experiment on fibrinopurulent peritonitis. The analysis addressed days 3 and 7 after conventional treatment or local composite gel application following abdominal sanitation. On day 3, controls showed marked necrosis, serosal edema, and neutrophilic infiltration, whereas the gel group showed emerging granulation tissue with initial new vessel formation and less necrosis. On day 7, well-developed granulation tissue with active fibroblasts and numerous new vessels was described in the gel group, contrasting with coarse fibrosis and lymphoid infiltration in controls. These observations distinguish early vascularized granulation from a predominantly coarse fibrous response. The findings describe tissue architecture and do not establish functional perfusion or a specific angiogenic mechanism.

Keywords: fibrinopurulent peritonitis; granulation tissue; new vessel formation; fibroblasts; early repair; local gel treatment

Relevance. Experimental wound models indicate that fibroblast behavior and endothelial organization provide distinct information about granulation tissue assembly [1]. An early peritoneal repair assessment should therefore consider the appearance of vascular structures together with stromal organization and residual necrosis. This approach addresses tissue architecture rather than treating fibroblast activity alone as evidence of successful repair.

Objective. To characterize the early vascular and stromal features of granulation tissue described during local composite gel treatment of experimental fibrinopurulent peritonitis.

Materials and methods. This focused qualitative analysis used descriptions from the same parent experiment involving 72 outbred white rats weighing 180–220 g. Conventional treatment served as the control. In the intervention group, a composite gel containing levofloxacin, kukumazin, and sodium carboxymethylcellulose was applied locally after abdominal sanitation. The parent study assessed tissue changes on days 3, 7, 14, and 21 under laboratory animal welfare guidance [2,3].

The present analysis was restricted to the reported day-3 and day-7 findings. Descriptions were considered across three components: necrotic and inflammatory changes, organization of fibroblast-containing granulation tissue, and appearance of newly formed vessels. This was a descriptive synthesis of reported morphology; vessel density, perfusion, and new p values were not derived from the qualitative observations.

Results. On day 3, the control descriptions emphasized necrosis, serosal edema, and marked neutrophilic infiltration. In the gel group, granulation tissue was already emerging, accompanied by

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initial new vessel formation and less pronounced necrosis. Thus, early vascular organization was described alongside a smaller necrotic component, rather than as an isolated vascular finding.

On day 7, control tissues were characterized by coarse fibrous changes and lymphoid infiltration. The gel group instead showed well-developed granulation tissue containing active fibroblasts and numerous newly formed vessels. The relevant distinction was the coexistence of vascular and stromal elements within granulation tissue, compared with the predominantly coarse fibrous pattern described in controls.

These descriptions support a morphological pattern of earlier vascularized granulation during local treatment. They do not demonstrate that the new vessels were functionally perfused or identify the signaling pathway responsible. The vascular and stromal findings should therefore be interpreted as structural features of early repair within this experiment.

Conclusions. Local composite gel treatment was associated with earlier granulation tissue formation and a vascularized stromal pattern on days 3 and 7. Considering new vessels together with fibroblast-containing tissue and residual necrosis adds a focused morphological perspective to the common experimental dataset. Functional vascular improvement remains outside the conclusions supported by these descriptions.

References

1. Tefft J.B., Chen C.S., Eyckmans J. Reconstituting the dynamics of endothelial cells and fibroblasts in wound closure. APL Bioengineering. 2021;5(1):016102. doi:10.1063/5.0028651.
2. Council of Europe. European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes. ETS No. 123. Strasbourg; 1986. https://rm.coe.int/168007a67b
3. National Research Council. Guide for the Care and Use of Laboratory Animals. 8th ed. Washington, DC: The National Academies Press; 2011. doi:10.17226/12910.