Development and Histopathological Characterization of a Murine Model of Diversion Colitis

A. Kleinwort[1], P. Döring[2], C. Hackbarth[1], C. Heidecke[1], T. Schulze[1]

[1] Department of General Surgery, Visceral, Thoracic and Vascular Surgery, Universitätsmedizin Greifswald, Greifswald, Germany
[2] Institute of Pathology, Universitätsmedizin Greifswald, Greifswald, Germany

Background: Diversion colitis occurs in colonic segments excluded from the faecal stream and is still a significant health problem. In order to investigate pathophysiological mechanisms we created a murine model of diversion colitis. The present study was conducted to optimize the model and to characterize histopathological and immunological changes during long term follow-up.

Methods: A diverting colostomy was created either in the ascending or transverse colon of C57BL/6 mice. The mice were euthanatized 14, 30 or 60 days postoperatively (p-op.). Histopathological analysis of colonic sections was performed after staining with HE, PAS reaction or chloroacetate esterase reaction. Mesenterial lymph node (MLN) were analysed by flow cytometry.

Results: While mice with a colostomy in the ascending colon showed unacceptably high mortality, long-term survival after colostomy in the transverse colon was good. Mice developed mild colitis in the bypassed segments. Histopathological changes were most pronounced 60 days p-op. While regulatory T cell and T_H1 cell numbers were significantly increased in MLN 14 days p-op, T_H2 and T_H17 cells were predominant 60 days p-op.

Conclusion: Our model is a promising tool to investigate immunological pathomechanisms of diversion colitis. Our results indicate that after initial predominance of regulatory T cell and T_H1 cell driven processes, T_H2 and T_H17 cell driven processes may maintain inflammation in the long term course. Further detailed immunological analysis of mucosal T cell dynamics and dendritic cell populations is required.

Section: Inflammation/Sepsis