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Research Article

The effects of 2.5% RADA self-assembling peptide on epithelization, number of fibroblast and degree of collagen in a dilated colon after a purposed mechanical bowel obstruction in Wistar rats

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ABSTRACT

Background: An intestinal anastomosis leakage is a complication that must be prevented as the prevalence of this leakage is 0, 5-21% in gastrointestinal anastomosis commonly and 1-12% in a colon anastomosis and 10-14% in low anterior colorectal resection anastomosis. Serosa is an important part as first integrity in the healing of bowel anastomosis. The application of 2.5% RADA self-assembling peptide may increase the healing process of anastomosis as a fibrin seal in serosa. This study was designed to determine the effects of 2.5% RADA self-assembling peptide on the healing process of colorectal anastomosis, judging from the degree of epithelization, number of fibroblasts, and degree of collagen in a dilated colon after a purposed obstruction.
Methods: This was an experimental study. Research subjects included 18 male Wistar rats that meet the inclusion and exclusion criteria, randomly divided into 2 groups, 9 rats were using 2.5% RADA self-assembling peptide and the others were not using 2.5% RADA self-assembling peptide. The research subjects were given the topical 2.5% RADA self-assembling peptide applying on serosa of colorectal after an anastomosis. All rats were sacrificed on the seventh day after anastomosis, and tissue sample of the anastomosis site were obtained for histopathological evaluations. The degree of epithelization, number of fibroblasts, and degree of collagen were evaluated by scoring methods. The Mann-Whitney was used to analyze a statistical significant ($p<0.05$).
Results: The mean epithelization in 2.5% RADA self-assembling peptide group was significantly higher than the mean epithelization in without 2.5% RADA self-assembling peptide group, similar with collagen degree in administration of 2.5% RADA self-assembling peptide group. It also showed a significant difference compared to without 2.5% RADA self-assembling peptide group. While the number of fibroblasts in the administration of 2.5% RADA self-assembling peptide group did not have a significant difference compared to the number of fibroblasts in the with 2.5% RADA self-assembling peptide group.
Conclusions: The administration of 2.5% RADA self-assembling peptide on healing anastomosis colonic obstruction in Wistar rats was significantly promoted anastomosis healing. However, further research is needed before applying the agent on human practice.

Keywords: 2.5% RADA self-assembling peptide, Colorectal anastomosis, Epithelization, Fibroblasts, Collagen

INTRODUCTION

Leakage of intestinal anastomosis is a feared complication in gastrointestinal surgery.[1,2] After the progress achieved in colorectal surgery, a good healing in intestinal anastomosis after resection of colon and rectal remains a challenge. The prevalence of intestinal leakage is generally 0.5 to 21% after colorectal surgery. Specifically, 1-12% post anastomosis of colorectal, 10-14% in the lower resection of colorectal. Goligher in