Effect of a 50-Hz sinusoidal electromagnetic field on the integrity of experimental colonic anastomoses covered with fibrin glue.

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Abstract:

Background. Low-frequency magnetic fields have been shown to affect biological In this article the effects of 50-Hz sinusoidal magnetic field (MF) stimulation and application of fibrin glue on the healing of experimental colonic anastomoses were investigated. Material and Methods. Twenty-eight rats were divided into four groups. Group 1 underwent 2-cm left colonic resection and primary anastomosis. Group 2 underwent normal resection anastomosis and the area was covered with fibrin glue. Group 3 underwent normal resection anastomosis and the rats were exposed to a 50-Hz sinusoidal MF. Group 4 underwent normal resection anastomosis, the anastomosis area was covered with fibrin glue, and the rats were exposed to a 50-Hz sinusoidal MF. Investigations included bursting pressure measurement, hydroxypro-line content, and histopathological changes. Results. Tissue hydroxyproline levels and anastomotic bursting pressures of groups 2, 3, and 4 were significantly higher than in group 1. Collagen deposition and fibroblast infiltration in groups 2, 3, and 4 had higher scores than in group 1. Furthermore, these results were significantly higher in group 4 rats than in the other groups. Histopathological examination of the anastomosis revealed significantly better healing patterns for group 4 than for groups 1, 2, and 3. Conclusions. A 50-Hz sinusoidal MF stimulation and application of fibrin glue provided a significant gain in anastomotic healing in the large intestine. A combination of a 50-Hz sinusoidal MF and fibrin glue has significantly favorable effects on healing of experimental colon anastomosis.