Fibrin glue improves the healing of irradiated bowel anastomoses.

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Publication Date: 1992

Abstract:

Many surgeons are reluctant to construct a bowel anastomosis with irradiated intestine. Previous studies have demonstrated diminished tensile strength of rat small bowel anastomoses that have been irradiated intraoperatively. To determine whether fibrin glue, a known tissue adhesive, improves the healing of these anastomoses, 69 male Sprague-Dawley rats were randomized into three anastomotic groups: Group 1, sutured ileal anastomosis without radiation or fibrin glue; Group 2, irradiated sutured ileal anastomosis without fibrin glue; and Group 3, irradiated ileal anastomosis with fibrin glue added to the suture line. Groups 2 and 3 received a single dose of 2,000 R intraoperatively. At seven days, the rats were sacrificed and the anastomotic segment was tested for breaking (tensile) strength. Anastomotic collagen content was evaluated using a hydroxyproline assay. Tensile strength results demonstrated that Group 2 was significantly weaker than Groups 1 and 3 ($P = 0.001$) and that the hydroxyproline content of Group 3 was significantly greater than that of Group 2 ($P = 0.015$). These results show that the addition of fibrin glue to an intraoperatively irradiated small bowel anastomosis improves healing, as demonstrated by both tensile strength and hydroxyproline content studies.