Effect of 5-fluorouracil plus interferon on the integrity of colonic anastomoses covering with fibrin glue.

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Abstract:

BACKGROUND: It has been well established that the immediate postoperative intraperitoneal administration of chemotherapeutic agents such as 5-fluorouracil (5-FU) after curative colon resection for colon cancer destroys disseminated cancer cells and inhibits micrometastases but also inhibits anastomotic healing. On the other hand, the application of fibrin glue constitutes a physical barrier around the anastomosis and may prevent anastomotic leakage. The purpose of this experimental study was to determine the effect of 5-FU plus interferon (IFN)-alpha-2a on the integrity of colonic anastomoses covered with fibrin glue when injected intraperitoneally immediately after colon resection.

MATERIALS AND METHODS: Sixty rats were randomized to one of four groups. After resection of a 1-cm segment of the transverse colon, an end-to-end sutured anastomosis was performed. Rats of the control and the fibrin glue groups were injected with 6 ml of 0.9% sodium chloride (NaCl) solution intraperitoneally. Rats in the 5-FU + IFN and the 5-FU + IFN + fibrin glue groups received 5-FU plus IFN intraperitoneally. The colonic anastomoses of the rats in the fibrin glue and in the 5-FU + IFN + fibrin glue groups were covered with fibrin glue. All rats were sacrificed on the 8th postoperative day, and the anastomoses were examined macroscopically. The bursting pressure measurements were recorded, and the anastomoses were graded histologically.

RESULTS: Only the 5-FU + IFN group had anastomoses rupture, and the rupture rate (33%) in this

group was significantly greater than in the other groups, where there were no ruptures (P = 0.015). The adhesion formations score was, on average, significantly higher in rats of the 5-FU + IFN group compared with the control group (P = 0.006) and the 5-FU + IFN + fibrin glue group (P = 0.010). Bursting pressures were significantly lower in the control group when compared to the fibrin glue and 5-FU + IFN + fibrin glue group (P < 0.001). Rats in the 5-FU + IFN + fibrin glue group developed significantly more marked neoangiogenesis than rats in the other groups. Inflammatory cell infiltration, collagen deposition, and fibroblast activity did not differ significantly among the four groups (P = 0.856, P = 0.192 and P = 0.243, respectively).

CONCLUSION: The immediate postoperative intraperitoneal administration of 5-FU plus IFN impairs colonic healing. However, when the colonic anastomoses were covered with fibrin glue, the injection of 5-FU plus IFN had no adverse effects on the integrity of the anastomoses.