Experimental study of intraoperative local chemotherapy with fibrin glue containing nitrosourea for malignant gliomas.

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Abstract:

BACKGROUND: Local control of the tumor bed after removal of a tumor is one of the most important points in the treatment of malignant gliomas. This study was designed to examine whether fibrin glue is useful as a vehicle for sustained release of intraoperative local chemotherapy with nitrosourea (ACNU). METHODS: The growth-inhibiting activity of ACNU on C6 glioma cells and ACNU released into 5-mL supernatant saline from fibrin glue containing 5 mg/mL (10 mg) of ACNU was measured in vitro. C6 tumor inoculated in rat brains was covered with fibrin glue containing either 2 mg/mL or 5 mg/mL of ACNU for 5 days, and the histologic changes were examined. RESULTS: ACNU inhibited the growth of C6 glioma cells in a dose-dependent manner, and the drug concentration required for 50% inhibition of cell growth (IC<inf>50</inf>) was about 4 mug/mL with 1 hour of treatment. Although about 50% of all ACNU included in the fibrin glue was released in the first hour, an effective concentration over the value of IC<inf>50</inf> was sustained even after 12 hours. A histologic examination showed tumor cells damaged within a depth of about 2- 3 mm from the tumor surface covered with fibrin glue containing ACNU. CONCLUSIONS: Fibrin glue may be useful as a vehicle for sustained-release chemotherapy, and intraoperative local chemotherapy with fibrin glue containing anticancer agents such as nitrosourea may be helpful in the local control of malignant gliomas.