Inhibition of intra-abdominal adhesions: Fibrin glue in a long term model.

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Abstract:

Fibrin glue is being used more frequently to assist in the control of surgical bleeding in the abdominal and thoracic cavities. Prior investigation at this institution has indicated that fibrin glue actually inhibits adhesion formation in the peritoneal cavity of rats up to the first week postoperatively. To ascertain whether this protective effect is borne out in the long term, a randomized study was performed in 42 rats. As in the initial study, bilateral circular peritoneal-muscular defects were created to induce adhesion formation. The right-sided defects were closed linearly with interrupted sutures, thus closing the peritoneum, and the left-sided defects were closed with a continuous suture placed circumferentially, leaving the peritoneal defect open. The rats were randomized to two groups. In 21 animals, the abdomen was closed with no further treatment. In the other 21 animals the defects were covered with fibrin glue made from 0.2 mL of human fibrinogen (31.5 g/L) from cryoprecipitate and 0.2 mL of bovine thrombin and calcium. All rats were killed at 30 days, and adhesions were graded on a scale of 0 to 4 by a blinded observer. In the control group, 15 of 21 rats had high grade adhesions to the closed defect compared with 3 of 21 in the experimental (fibrin glue) group (P = 0.0003). For the left-sided lesions, 16 of 21 animals in the control group had high grade adhesions compared with 2 of 21 animals in the experimental group (P = 0.0004). In addition, the liver was firmly adhesed to 10 of the 42 defects created in the control models compared with only 3 of the 42 defects in the experimental group (P = 0.035). We conclude that fibrin glue serves as a biological dressing that protects against adhesion formation in the abdomen during the initial healing process and that through this inhibition, there is a marked

decrease in the amount of adhesions, even at long term follow-up.