Basic animal experiment on the utility of fibrin sealant in combination with various hemostatic agents for use in laparoscopic partial nephrectomy.

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Abstract:

OBJECTIVE: In this study, we investigated the adhesiveness to the renal tissue of some sheet-type hemostatic agents used with a liquid fibrin sealant using animal kidneys. (Figure Presented) METHODS: In Experiment A, component solutions of liquid fibrin sealant were dripped onto a kite string placed on a removed porcine kidney slice. No hemostat, or one of the sheettype hemostats, such as collagen, gelatin, or oxidized-cellulose, was placed on a kite string, and a string scale was used to measure the force needed to pull the string apart vertically from the slice. The weight data were analyzed statistically. In Experiment B, liquid fibrin sealant alone, or in combination with the same kind of sheet-type hemostat was applied to the cut surface of the hilus clumping kidney of anesthetized living rabbits, and after declamping, the severity of bleeding was checked. The evaluated parameters included the number of times the process was needed to secure hemostasis. Histological analyses were also performed to compare the degree of adherence of the aforementioned hemostats to kidney tissue. RESULTS: The combination of fibrin sealant plus a collagen hemostat was clearly superior in Experiment A. In Experiment B, fibrin sealant plus the collagen or gelatin hemostat was found to have a stronger hemostatic effect (Table 1). The histological investigation only with these hemostats showed a continuous layer of fibrin adhering to the renal tissue (Fig 1). CONCLUSIONS: Fibrin sealant used in combination with the a collagen hemostat was considered the most suitable for obtaining reinforced hemostatic effect at the suture site in partial nephrectomy.