

Comparative study of different biological glues in an experimental model of surgical bleeding in anesthetized rats: Platelet-rich and -poor plasma- based glue with and without aprotinin versus commercial fibrinogen-based glue.

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Abstract:

The use of fibrin glue in cardiovascular surgery has been associated with decreased operative time, effective control of localized bleeding, and reduced postoperative blood loss. All preparations of fibrin glue mimic the final common pathway of the coagulation cascade in which fibrinogen is converted to fibrin in the presence of thrombin and calcium. The goal of the study was to compare five different types of fibrin glue, with or without aprotinin, on a surgical bleeding model in the rat. In 70 anesthetized Wistar rats, after laparotomy, a 3 cm liver incision was performed. After randomization, seven groups were studied. In the first group, Biocol was used as a pinpoint application to the bleeding site. Four groups received a fibrin glue obtained from a single human donor plasma using Cell Saver V (Haemonetics). The sealant was applied as a two-component system. The first component of the glue was either platelet-rich-plasma (PRP) or platelet-poor-plasma (PPP). The second component consisted of a mixture of 0.5 ml CaCl 10% with 1000 U of human thrombin, with or without 400KUI of aprotinin (AP). The last two groups, control and aprotinin were treated using saline solution or topical aprotinin respectively. Hemoglobin and hematocrit were measured before surgery and 30 min after application of the glue. The decrease in hemoglobin (Hb) and hematocrit (Hct) was the primary efficacy variable. Before surgery, there was no difference regarding Hb and Hct values between groups. Thirty min after the application of the glue, the decrease in hemoglobin expressed as percent of the control values is only significantly

lower in the Biocol group when compared to control. No significant difference was observed with the other groups in comparison to control. The commercial fibrin glue (Biocol) is more efficient than other preparations. This efficacy is likely due to a higher fibrinogen concentration.