

Thrombogenic effects of a nonthrombin-based fibrin sealant compared with thrombin-based fibrin sealant on microvenous anastomoses in a rat model.

Authors: Drake D.B., Faulkner B.C., Amiss L.R. Jr., Spotnitz W.D., Morgan R.F.

Publication Date: 2000

Abstract:

The efficacy and safety of tissue adhesives needs to be clearly defined. A thrombin-based preparation of fibrin sealant has recently been shown to have deleterious effects on microvascular anastomoses in an animal model. The authors found that fibrin sealant constructed with a high concentration of bovine thrombin (1,000 IU per milliliter) was detrimental to microvascular patency when applied to the anastomosis in a rat free flap model. The microvenous anastomosis had the highest rate of thrombosis and failure in this model. A nonthrombin-based fibrin sealant has recently become available for experimental investigation. This study examined the thrombogenic effect of this nonthrombin-based fibrin sealant on microvenous anastomoses in a rat free flap model compared with the effect of traditionally prepared fibrin sealant with varying concentrations of thrombin. The conclusions reveal that flap survival with application of the nonthrombin-based fibrin sealant to the anastomosis was comparable with flap survival of the control animals. Flap survival with application of the traditionally prepared thrombin-based fibrin sealant was also comparable with flap survival of the control animals when a concentration of 500 IU per milliliter of thrombin was used. However, flap survival decreased significantly ($p < 0.005$) when a concentration of 1,000 IU per milliliter of thrombin was used in the construct of the fibrin adhesive. These results support the previous findings of the harmful effects of thrombin when used in high concentrations and applied to the microvenous anastomosis of this free flap model. Moreover, this initial investigation with a nonthrombin-based fibrin sealant did not show any deleterious effects on the microvenous

anastomosis compared with control animals.