Risk of Thromboembolus after Application of Different Tissue Glues during Microvascular Anastomosis.

Abstract:

Tissue glues are a useful tool for hemostasis and a potential tool for microvascular anastomosis. The hemostatic power and thrombotic risk of these surgical aids have been the subject of debate, but studies regarding thromboembolic risks of tissue glues are lacking. The authors compared the thromboembolic risk of three different tissue glues (six interrupted sutures complemented with fibrin, FloSeal, or TachoSil) against a control group (12 interrupted sutures) in the aorta-filter model in the rat. Each group consisted of 10 rats, examined 4 hours and 14 days postoperatively (total n = 80) using a structured protocol to assess the patency and condition of the filter, amount of thromboembolic material, and histologic appearance of the vessel wall. In total, 160 anastomoses were performed in 80 rats. The overall patency rate for the groups was 90 percent (control), 35 percent (fibrin glue), 25 percent (FloSeal), and 10 percent (TachoSil). All experimental groups had significantly faster mean anastomotic times and less blood loss compared with the control group. Patency rates were reduced and thromboembolic material was significantly increased in all experimental groups. Histologically, the use of tissue glue reduced the incidence of irritation of the internal elastic lamina and was associated with an increased incidence of fibrocyte infiltration of the media, hypercellularity of the adventitia, and
adventitial neovascularization and lymphangiogenesis. The application of tissue glues in microvascular anastomosis reduces the time needed for anastomosis but was associated with a statistically significant increase in thromboembolism.