

Fibrin glue sealing of polytetrafluoroethylene vascular graft anastomoses: Comparison with oxidized cellulose.

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Abstract:

To evaluate potential clinical applications of nonautologous fibrin glue (FG) as a hemostatic agent in vascular surgery, we compared its efficacy to oxidized regenerated cellulose (OC) in hemostatically sealing polytetrafluoroethylene (PTFE) vascular graft anastomoses. PTFE grafts (4 mm wide and 4 to 6 cm in length) were placed to each femoral artery in a heparinized canine model, in end-to-end fashion in half of the dogs and in end-to-side fashion in the remaining dogs. Each set of graft-arterial anastomoses was then sealed with either FG or OC, determined randomly, followed by simultaneous measurement of blood loss through the graft anastomoses and needle holes. There was significantly less bleeding from anastomoses sealed with FG compared with those sealed with OC, regardless of whether the anastomosis was constructed in end-to-end ($p < 0.03$) or end-to-side ($p < 0.004$) fashion; overall, the operative blood loss for grafts sealed with FG was 14 ± 6 (mean \pm standard error of the mean) vs 99 ± 27 ml/min for those sealed with OC ($p < 0.001$). In the early postoperative period, significant groin hematomas occurred more frequently in grafts sealed with OC compared with those sealed with FG. Microscopic examination of graft-arterial specimens harvested at postoperative intervals ranging from 1 day to 3 months revealed no significant inflammatory reaction with either hemostatic agent; after 2 to 3 weeks, paired specimens appeared histologically similar despite previous treatment with either FG or OC. There were no significant differences in anastomotic wound healing or graft patency between the two groups. We conclude that FG provides rapid hemostatic control of hemorrhage, is superior to OC as a hemostatic agent, does not impair anastomotic wound healing, may be left in situ without causing stenosis or graft thrombosis, and has

good systemic and local compatibility.