New application method of fibrin glue for more effective hemostasis in cardiovascular surgery: Rub-and-spray method.

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Abstract:

Objective: This study was performed to determine the most effective application method of fibrin glue as a hemostatic sealant in cardiovascular surgery. Methods: The effectiveness of fibrin glue as a hemostatic sealant was compared between 4 methods of application; dripping, spray, spray-and-rub, and rub-and-spray methods. I. In vitro 'burst pressure' was measured in fibrin glue-sealed needle holes of polytetrafluoroethylene (PTFE) graft in each method. II. Fibrin glue-sealed needle holes of PTFE grafts implanted between an abdominal aorta and iliac arteries of a pig was microscopically examined to determine the effectiveness of fibrin glue sealing in each method. Results: I. Burst pressures were 24.1+/-7.9 mmHg in dripping, 98.1+/-35.4 mmHg in spray, 140.8+/-34.8 mmHg in spray-and-rub and 206.7+/-26.1 mmHg in rub-and-spray method (statistically significant, $p<0.01$, between each method). H. Microscopically, no fibrin glue remained on the external surface of the PTFE graft in the dripping method. Fibrin glue plugged 1/3 or 2/3 of the depth of the needle hole in the spray method and spray-and-rub methods respectively. In the rub-and-spray method, fibrin glue covered the needle hole over the external surface of the graft, completely plugged the needle hole to its whole depth, leaving no spaces where blood came into the needle hole. Conclusion: The rub-and-spray method of fibrin glue application revealed the strongest sealing and hemostatic effects, and can be safely and effectively used for hemostasis in cardiovascular surgery that requires systemic heparinization or prolonged extracorporeal circulation.