New pre-clotting method for fibrin glue in a non-sealed graft used in an LVAD: The KYO method.

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Publication Date: 2010

Abstract:

Pre-clotting has been applied to a vascular prosthesis with high permeability (non-sealed graft). In this study, conventional pre-clotting methods were compared with our novel method, which keeps high-yield optimization of hemostasis, the KYO method. Fibrinogen solution (A) and thrombin solution (B) of fibrin glue (Beriplast P Combi-Set) were applied to the graft (Cooly low-porosity woven graft) by five methods; Group 1: control, without fibrin glue; Group 2: spray method, spraying solutions A and B simultaneously; Group 3: rub method, rubbing solution A first, and then rubbing solution B on the graft; Group 4: rub-and-spray method, rubbing solution A on the graft, then spraying solutions A and B; Group 5: the KYO method, rubbing solution A into the graft with the finger, then rubbing solution B on the graft. Burst pressure, the point of saline solution leakage, was measured 10 times for each group. The grafts were microscopically examined using HE staining and electron microscopy. The average burst pressure was 12.6 +/- 1.5 mmHg in Group 1, 27.1 +/- 3.3 mmHg in Group 2, 22.4 +/- 7.1 mmHg in Group 3, 41.0 +/- 9.0 mmHg in Group 4, and 300 mmHg in Group 5. Saline solution did not leak through the graft at a pressure of 300 mmHg in Group 5. There were statistically significant differences among the groups. The relationship between fibrin glue and the graft was unclear in all groups by HE staining. Electron microscopic photographs showed a smooth surface and fibrin glue permeating the graft fibers in Group 5. The KYO method was better than the others in terms of resistance to pressure. It was a very simple method, and could thus come into widespread use.