Hemostatic effectiveness of a new application method for fibrin glue, the "rub-and-spray method", in emergency aortic surgery for acute aortic dissection.

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Abstract:

Purpose: This study was performed to evaluate the clinical hemostatic effectiveness of a new application method for fibrin glue, the rub-and-spray method, in aortic surgery. Methods: Twenty consecutive patients undergoing emergency ascending aorta or ascending- hemiarch replacement for Stanford type A acute aortic dissection were prospectively randomized into 2 groups, one with the rub-and-spray method (group G, 10 patients) and one without fibrin glue (group C, 10 patients). The rub-and-spray method consists of using a finger to rub the fibrinogen solution over needle holes, then spraying the fibrinogen solution and the thrombin solution simultaneously over the anastomosis, using an application nozzle. The number of bleeding needle holes at the proximal and distal anastomoses just after reperfusion, the hemostatic period (time from administration of protamine sulfate until closure of the pericardium), and the amounts of blood losses during this hemostatic period were measured. Results: The values in group G and group C were as follows: proximal needle holes (26.8 +/- 1.5, 26.4 +/- 2.4, p = 0.466); proximal bleeding needle holes (0.2 +/- 0.4, 19.3 +/- 3.5, p <0.001); distal needle holes (28.7 +/- 2.5, 27.8 +/- 4.4, p = 0.675); distal bleeding needle holes (1.3 +/- 1.2, 19.9 +/- 5.0, p <0.001); estimated bleeding proportion of the proximal needle holes (0.7 +/- 1.6%, 73.8 +/- 16.0%, p <0.001); estimated bleeding proportion of the distal needle holes (4.4 +/- 3.7%, 71.9 +/- 15.7%, p <0.001); estimated median hemostatic period (41.5 min [32-49], 51 min [44-89], p = 0.036); amounts of blood losses during this hemostatic period (99 +/- 76 ml, 257 +/- 163 ml, p = 0.016). The number of bleeding needle holes, the bleeding proportion

of the proximal and distal needle holes, the hemostatic period, and the amounts of bleeding during this hemostatic period were significantly less in group G. Conclusion: This new application method for fibrin glue, the rub-and-spray method, revealed significant hemostatic effectiveness, even in hemostatically difficult surgery of acute aortic dissection that requires systemic heparinization and prolonged cardiopulmonary bypass with deep hypothermia.