Transfusion of allogeneic blood products in proximal aortic surgery with hypothermic circulatory arrest: effect of thromboelastometry-guided transfusion management

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OBJECTIVES
Proximal aortic surgery with hypothermic circulatory arrest (HCA) commonly involves perioperative transfusion of allogeneic blood products, including red blood cells, plasma, and platelets. The authors hypothesized that surgery with HCA could be performed without allogeneic blood products and that a thromboelastometry-guided algorithm would reduce the transfusion of allogeneic blood products.

DESIGN
A retrospective analysis of prospectively collected data. Patients with and without thromboelastometry guidance were compared by case-control analysis (n = 62 matched patients) and multivariate regression (n = 194 patients).

SETTING
Single-center university hospital.

PARTICIPANTS
This study included 194 patients undergoing elective and emergent procedures with HCA involving the proximal aorta.

INTERVENTIONS
A thromboelastometry-guided treatment algorithm during surgery was used in 153 patients (79%), and conventional coagulation management was used in 41 patients (21%).

MEASUREMENTS AND MAIN RESULTS
During surgery and the following 24 hours, allogeneic blood products were transfused in 106 patients (55%). Median (interquartile range) number of allogeneic blood products transfused was 1 unit (0-6 units). Case-control analysis showed lower transfusion rates of red blood cells, plasma, and any allogeneic blood product (all p<0.050) in patients with thromboelastometry guidance. In the multivariate analysis, thromboelastometry guidance was
associated with an odds ratio of 0.26 (95% confidence interval, 0.08-0.84; p = 0.025) for the transfusion of any allogeneic blood product. The use of thromboelastometry was not associated with adverse events (odds ratio 0.72; 95% confidence interval, 0.27-1.90; p = 0.507).

CONCLUSIONS
Allogeneic blood products were avoided in a proportion of patients. The findings further suggest that thromboelastometry-guided coagulation management promoting the use of coagulation factor concentrates decreased the use of allogeneic blood products during complex cardiac surgery.