Fibrin glue in surgery: frequent development of inhibitors of bovine thrombin and human factor V.

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Abstract:

We report on a 34-year-old woman whose plasma showed a marked prolongation of thrombin time (TT) (> 200 s) using bovine thrombin. The patient had previously been exposed twice to topical bovine thrombin contained in fibrin glue during cardiac surgery. TT was normal when human thrombin was used as reagent. The patient's purified IgG reacted with bovine prothrombin and bovine thrombin in immunoblotting studies but showed virtually no cross-reaction with human thrombin. In addition, following surgery, factor V clotting activity (FV:C) was reduced to 9% of normal. The inhibitor of bovine thrombin persisted over a period of more than a year, while the level of FV:C progressively returned to normal within this time period. Development of thrombin and FV:C inhibitors was also investigated in plasma of 34 consecutive patients who had undergone either cardiac surgery or neurosurgery with use of fibrin glue containing bovine thrombin. Eleven of 24 patients after cardiac surgery and two of 10 patients after neurosurgery presented with TT > or = 25 s (normal plasma 15 s). Two patients had been re-exposed to fibrin glue during cardiac re-operation and showed markedly prolonged TT (> 60 s). All 13 patients who had acquired a thrombin inhibitor also had low FV:C activity (10-60% of normal plasma), whereas FV:C activity remained in the normal range in the 21 patients with normal TT. Our findings indicate that development of inhibitors of bovine thrombin as well as co-immunization to factor V occurs frequently and is associated with the amount of applied fibrin glue and with the type of operation. Re-exposure to fibrin glue seems to enhance formation of inhibitors of bovine thrombin and human factor V.