Introduction of a potent single-donor fibrin glue for vascular anastomosis: An animal study.

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Abstract:

Background: Vascular anastomosis is considered as a difficult surgical procedure. Although different alternative methods have been tried to tackle these difficulties, none were found to be successful. Commercial fibrin glue has recently been used for vascular anastomosis. However, it did not gain popularity due to some limitations such as low tensile strength, rapid removal by the immune system, and risk of transmission of blood-borne viral infections. In this article, we presented a novel method for producing single-donor human fibrin glue and determined its success rate for vascular anastomosis in an animal model. Materials ans Methods: In this study, 3 mL of single-donor fibrin sealant was prepared from 150 mL of whole blood containing 50-70 mg/mL of fibrinogen. The study was performed on 10 dogs and 5 cats. After transection of the carotid artery, both ends were anastomosed by means of 3-4 sutures (Prolene 8-0). The suture line was then sealed with one layer of the new fibrin sealant. After 3-8 weeks, the site of anastomosis was evaluated angiographically and morphologically for healing and possible complications such as thrombosis or aneurysm. Results: In evaluations 3 weeks after the surgery, all arterial anastomoses were patent in dogs, but some degree of subintimal hyperplasia was noted. After 8 weeks, all anastomoses were patent and the degree of subintimal hyperplasia was decreased. In cats on the other hand, after 4 weeks, all anastomoses were patent and subintimal hyperplasia was absent. Conclusions: Single-donor fibrin glue was a quite reliable and practical alternative to minimize suturing and therefore operative time in our animal model. This sealant can easily be obtained from the patient's whole blood. Its application in humans would require further studies.