Histological changes in the rat common carotid artery induced by aneurysmal wrapping and coating materials.

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Abstract:

Histological changes in and around the arterial walls of rats were investigated following topical application of aneurysmal wrapping and coating materials, including a fibrin glue, a cyanoacrylate glue (Biobond), and cotton fibers (Bemsheet). Bilateral common carotid arteries were exposed using sterile techniques, and one of the test materials was applied to the right artery. The left artery was used as the control. Changes in arterial histology were evaluated at 2 weeks, 1 month, 2 months, and 3 months after surgery. The fibrin glue was surrounded by intense inflammation at 2 weeks after surgery. Both the fibrin glue and inflammation had disappeared at 2 months, but the glue had induced mild inflammation in the adventitia. Biobond caused chronic inflammation, necrosis of the media, and thickening of the arterial wall due to fibrosis in both the media and adventitia. Bemsheet produced chronic inflammation, progressive fibrosis, and granuloma. Connective tissue increased in the adventitia, but no major changes were observed in the media. The Bemsheet fibers remained unchanged, and adhered to the arterial wall. Although arterial stenoses were not observed in the present study, the results suggest that cyanoacrylate glue can cause the arterial occlusive lesions observed following aneurysm surgery.