

Differential, time-dependent effects of perivenous application of fibrin glue on medial thickening in porcine saphenous vein grafts.

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Abstract:

OBJECTIVE: Neointimal and medial thickening play a critical role in late vein graft failure following CABG. Previous ex vivo experiment suggested that perivenous application of fibrin glue may reduce the damage in the circular smooth muscle cell layer of the media of the vein graft shortly after exposing to arterial pressure. However, the in vivo as well as the longer term impact of this intervention remain unknown.

METHODS: Bilateral saphenous vein-carotid artery interposition grafting was performed in eight large white pigs (35-45 kg). In each pig, one of the grafts was randomly selected to receive perivenous fibrin glue support while the contralateral graft served as control. At 1 and 4 months following surgery (n=4 pigs in each group), all 16 patent vein grafts were removed and pressure-fixed. Multiple histological sections from each graft were prepared. Proliferating cell nuclear antigen (PCNA) was detected by immunocytochemistry. Vein graft morphology was assessed using computer-aided planimetry.

RESULTS: Although perivenous application of fibrin glue had little effects either on medial thickness 1 month after implantation or on PCNA index, it significantly increased medial thickness (control: 0.37 ± 0.02 mm; treated: 0.55 ± 0.02 mm, $p < 0.001$) and total wall thickness (control: 0.75 ± 0.04 mm; treated: 0.92 ± 0.04 mm, $p = 0.008$) at 4 months (mean \pm SEM; n=4 in each group).

CONCLUSIONS: Our data indicated that perivenous application of fibrin glue enhances graft thickening and as such does not constitute a strategy for preventing late vein graft failure after CABG.