Platelet deposition on ePTFE grafts coated with fibrin glue with or without FGF-1 and heparin.

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Abstract:

Introduction. The disappointing long-term patency of small-caliber prosthetic grafts may be due in part to early thromhogenicity of the prosthetic surface. We previously reported that the coating of expanded polytetrafluoroethylene (ePTFE) with fibrin glue (FG) containing fibroblast growth factor type 1 (FGF-1) and heparin accelerated spontaneous endothelial coverage of ePTFE grafts in an animal model; however, FG's effect on platelets remains unclear. This study was done to evaluate platelet deposition onto FG/FGF-1/heparin-coated vs FG-coated vs whole-blood- preclotted ePTFE surfaces. Methods. Twelve 5-cm ePTFE grafts were treated either with FG (thrombin, 0.32 U/ml, and fibrinogen, 32.1 mg/ml, n = 8) or with FG containing FGF-1 (11 ng/ml) plus heparin (250U/ml, n = 4). Twelve control ePTFE grafts were preclotted with canine (n = 8) or human (n = 4) whole blood. These treated grafts were placed onto a loop pulsatile perfusion system in pairs (preclotted with either FG or FG/FGF-1/heparin) and perfused with a M-199/10% FBS/¹¹¹indium-labeled platelet suspension. After 60 min the grafts were gamma counted and CPM/mm² were determined. Results. In both trials, the preclotted ePTFE grafts demonstrated similarly increased platelet deposition when compared to grafts treated with FG/FGF-1/heparin or FG alone ($P < 0.001$ for each). Conclusion. The decrease in platelet deposition on the FG/FGF-1/heparin-coated grafts vs preclotted grafts is not due to heparin and is not specific to canine or human platelets. FG-coated grafts may induce a decrease in early graft thrombogenicity when compared to whole blood preclotting.