Intracoronary beta-irradiation enhances balloon-injury-induced tissue factor expression in the porcine injury model.

Intracoronary brachytherapy (ICBT) effectively reduces restenosis but is associated with late thrombosis. Since tissue factor (TF) is an important mediator of arterial thrombosis, we tested the hypothesis that ICBT results in persistently augmented TF expression. Coronary arteries from 12 pigs were randomized to: control (C; no injury), oversized balloon injury (BI), or BI followed by ICBT. Animals were sacrificed at 1, 7, 14, or 60 days postprocedure, and coronary arteries collected for expression analyses and immunostaining. ICBT-treated arteries had higher TF antigen and activity at all time-points compared to BI arteries (Western blot: 16 571 +/- 2090 vs 10 135 +/- 2939 densitometric units, p = 0.001; ELISA: 0.42 +/- 0.13 nM vs 0.25 +/- 0.14 nM, p = 0.001; TF activity assay: 0.303 +/- 0.11 nM vs 0.18 +/- 0.07 nM, p = 0.01; immunohistochemical staining: 30.6 +/- 6.6% vs 11.5% +/- 3.2%, p = 0.01). TF expression increased following BI, increased further following ICBT, and persisted for the duration of the study. We conclude that TF expression increases after BI, but is further increased and persists for a longer duration following ICBT, suggesting that a TF-mediated mechanism may play a role in late thrombosis following ICBT.