Non-invasive imaging of glycoprotein VI binding to injured arterial lesions.

Glycoprotein VI (GPVI) is the major platelet collagen receptor and plays a critical role in the process of thrombosis at sites of atherosclerotic lesions. This study evaluates the feasibility of radiolabeled soluble GPVI to identify injured arterial lesions. Radiolabeling was carried out using the iodoogen method and resulted in radioiodinated GPVI in radiochemical yields between 97-100%. The biodistribution of [(125)I]GPVI was determined in normal mice and demonstrated a blood clearance halftime of approximately 5.5 hours. Vascular lesions were induced in the carotid artery in wild type and ApoE(-/-)mice. Immediately after injury radioiodinated GPVI was injected intravenously. Binding of [(123)I]GPVI to carotid lesions was assessed by szintigraphic in vivo imaging. Carotid arteries were explanted for ex vivo autoradiography and histological characterization of the lesion. In vivo and ex vivo imaging revealed substantial accumulation of radioiodinated GPVI in the injured artery wall, with a ratio of lesion to control vessel of 3:1 and 7:1, respectively. Because GPVI is the critical collagen receptor that mediates platelet adhesion to vascular lesions, soluble radiolabeled GPVI may be an agent for non-invasive imaging of thrombogenic thus, vulnerable atherosclerotic plaques.
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