

A phase 1, first-in-human study of ¹⁸F-GP1 positron emission tomography for imaging acute arterial thrombosis

EJNMMI Research

Sun Young Chae^{1*}, Tae-Won Kwon^{2*}, Soyoung Jin^{3*}, Sun U Kwon⁴, Changhwan Sung¹, Seung Jun Oh¹, Sang Ju Lee¹, Jungsu S. Oh¹, Youngjin Han², Yong-Pil Cho², Narae Lee⁵, Ji Young Kim⁶, Norman Koglin⁷, Mathias Berndt⁷, Andrew W. Stephens⁷, Dae Hyuk Moon¹

¹Department of Nuclear Medicine, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea,

²Department of Vascular Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea,

³Department of Nuclear Medicine, Nowon Eulji Medical Center, Eulji University, Seoul, Republic of Korea,

⁴Department of Neurology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea,

⁵Department of Nuclear Medicine, Wonju Severance Christian Hospital, Yonsei University Wonju College of Medicine, Wonju, Republic of Korea,

⁶Department of Nuclear Medicine, Guri Hospital of Hanyang University Medical Center, Hanyang University College of Medicine, Guri, Republic of Korea,

⁷Life Molecular Imaging GmbH (formerly Piramal Imaging GmbH), Berlin, Germany

Corresponding author: Dae Hyuk Moon, Department of Nuclear Medicine, Asan Medical Center, University of Ulsan College of Medicine, 88, Olympic-ro 43-gil, Songpa-gu, Seoul 05505, Republic of Korea. Tel: 82-2-3010-4592, Fax: 82-2-3010-4588, E-mail: dhmoon@amc.seoul.kr

Table S1. Clinical laboratory parameters for safety assessment

Categories	Parameters
Hematology	Erythrocytes, leukocytes, hemoglobin, hematocrit, platelets
Clotting time	Prothrombin time, reagent-independent prothrombin ratio (INR, international normalised ratio), activated partial thromboplastin time
Serum chemistry	Glutamate pyruvate transaminase, glutamate oxaloacetate transaminase, alkaline phosphatase, total bilirubin, creatinine, chloride, potassium, sodium, total protein, blood urea nitrogen, albumin
Urine analysis	pH-value, erythrocytes, leukocytes, nitrite, protein, bilirubin

Table S2. ¹⁸F-GP1 uptake over time

Time, min ^a	SUVmean value ^b				
	AAT foci	Spleen	Kidney	Liver	Blood pool
0	6.3 (4.2–9.8)	10.2 (8.7–11.0)	12.3 (7.2–15.1)	1.3 (1.2–1.5)	9.8 (9.0–10.8)
3	5.7 (3.9–6.9)	10.0 (8.5–10.8)	9.8 (7.1–11.8)	1.2 (1.2–1.4)	5.3 (4.6–5.8)
7	3.7 (3.0–4.6)	9.3 (8.1–9.7)	9.0 (6.7–10.3)	1.1 (1.0–1.3)	4.1 (3.9–4.5)
15	3.5 (2.7–4.4)	8.3 (7.7–9.3)	8.4 (6.4–9.6)	1.0 (0.9–1.2)	3.2 (3.0–3.5)
23	3.1 (2.5–3.8)	7.3 (6.1–8.4)	7.1 (5.6–8.3)	0.8 (0.5–1.0)	2.7 (2.4–3.0)
60	3.2 (2.3–4.5)	3.2 (2.7–4.2)	3.1 (2.5–3.9)	0.4 (0.2–0.6)	2.0 (1.6–2.1)
120	3.2 (2.6–4.3)	1.4 (0.9–1.9)	1.3 (0.8–1.7)	0.1 (0.0–0.4)	1.5 (1.1–1.7)

^aTime in minutes after ¹⁸F-GP1 injection.

^bData are presented as median (interquartile range).

AAT, Acute arterial thrombosis; SUV, standardised uptake values.

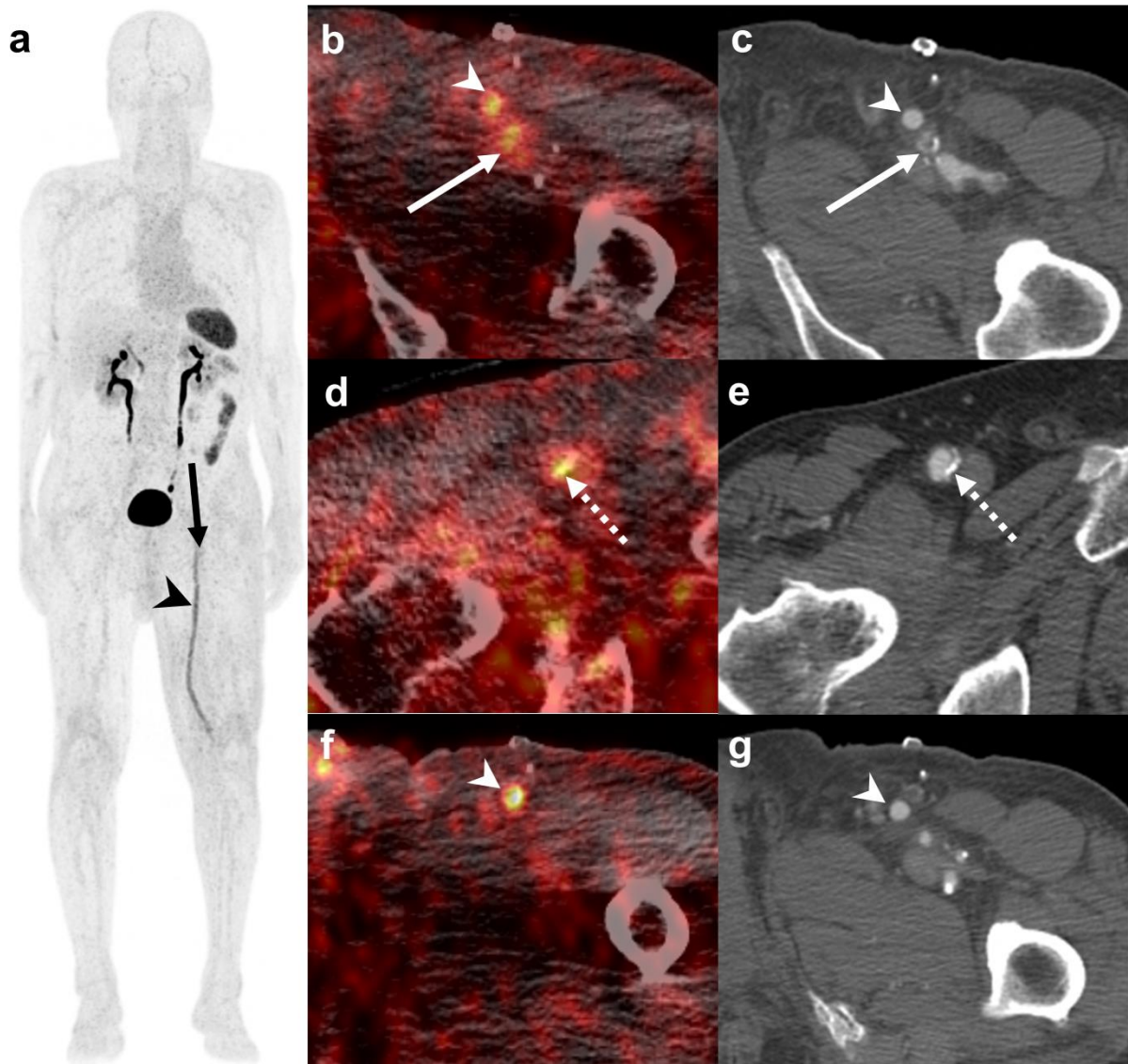


Fig. S1 ^{18}F -GP1 PET/CT images of a 76-year-old man with bypass surgery and stent placement. Anterior maximum intensity projection and transaxial images of ^{18}F -GP1 PET/CT at 120 min after injection show a focal increased uptake in the left superficial femoral artery (a and b; arrows), which corresponds to the total occlusive lesion with calcified plaque (c). Additional positive ^{18}F -GP1 uptakes are observed in the right common femoral artery with calcification (d and e; dotted arrows) and left femoral popliteal bypass graft (a, b, c, f and g; arrow heads), which was performed 3 days before ^{18}F -GP1 PET/CT.