

Summary

Biodistribution of Hypoxic Marker, ^{99m}Tc-HL91 (4,9-diaza-3,3,10,10-tetramethyldodecan-2,11-dione dioxime)

Takayuki SUZUKI, Kayoko NAKAMURA, Takatsugu KAWASE and Atsushi KUBO

Department of Radiology, School of Medicine, Keio University

^{99m}Tc-HL91 (4,9-diaza-3,3,10,10-tetramethyldodecan-2,11-dione dioxime) was developed as a hypoxic marker. Athymic mice bearing human tumors were administered with ^{99m}Tc-HL91 to evaluate it from the clinical point view. The tumor was visualized clearly 4 hours after injection. The biodistribution study revealed that ^{99m}Tc-HL91 was accumulated in the liver (tissue-to-blood ratio (T/B) = 11.5) and kidney (2.25) with higher than in the tumor (1.01). Oxygen condition of the tumor and muscle was measured by using the probe. ^{99m}Tc-HL91 uptake of tumors with PO₂ (tumor-to-muscle ratio) under 0.55 was higher

than that with 0.55 or higher PO₂. Oxygen condition of tumors with 1.0 or higher uptake (tumor-to-blood ratio) was lower than that with the lower uptake. Autoradiography of tumor sections indicated that ^{99m}Tc-HL91 was scarcely accumulated in the necrotic and viable areas while strong radioactivity was observed in the border zone (speculated to be hypoxic condition). Our experimental results suggest that the ^{99m}Tc-HL91 scintigraphy may be useful for evaluating oxygenation status of some tumors in non-abdominal region.

Key words: ^{99m}Tc-HL91, Tumor hypoxia, Autoradiography, Necrosis, Viable.