

Ischemic Conditions of Lower Extremity Muscle — Alternative Method of Estimation Using Spectral Computed Tomography —

Mitsuru Matsukura, MD, PhD; Junji Mochizuki; Shinya Misawa; Yoshiki Hata, MD, PhD

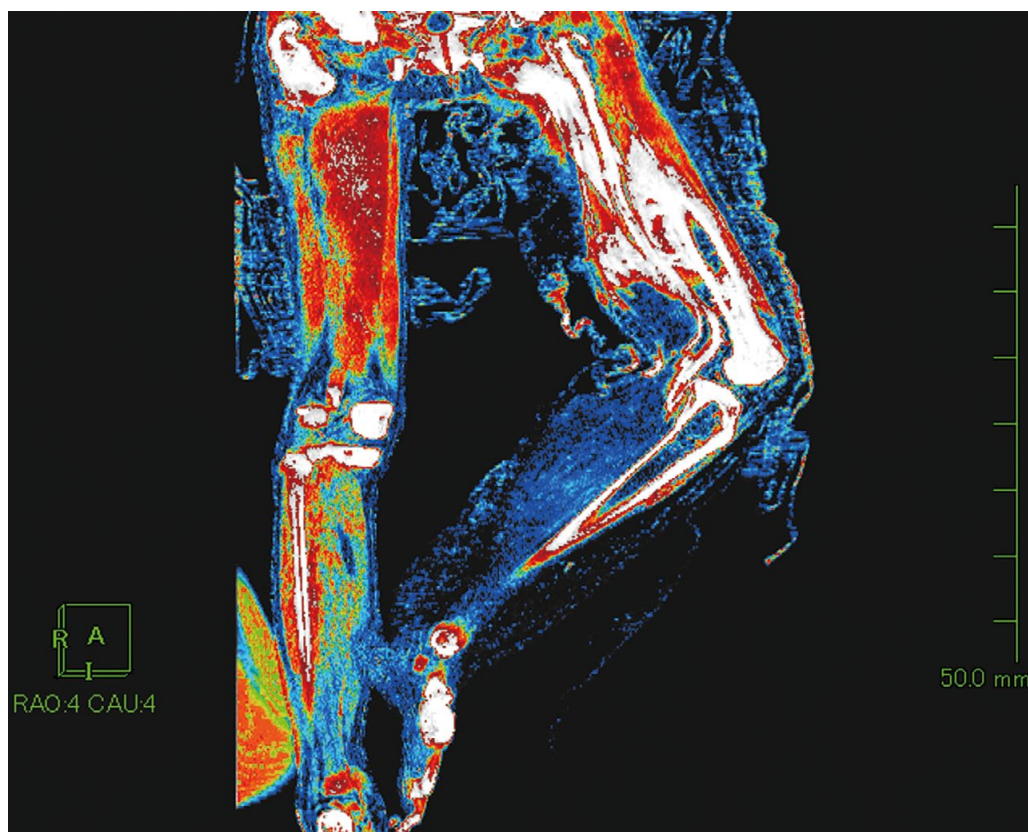


Figure. Coronal image of the bilateral lower extremities. For extraction of extracellular volume fraction (ECV), regions of interest (ROI) were drawn manually in each segment of the lower extremities with dedicated software (Aze Virtual Place, Kanagawa, Japan). ECV of the lower extremities was calculated as follows: $ECV (\%) = (1 - \text{hematocrit}) \times (\Delta HU_m / \Delta HU_b) \times 100$, where ΔHU_m is the overlay attenuation of the lower extremity muscles and ΔHU_b is the overlay attenuation of blood in normal tissue. Each muscle is colored based on calculated ECV score: red, ECV score >90%; blue, ECV score <10%; green, ECV score 30–50%.

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Division of Vascular Surgery, International University of Health and Welfare Mita Hospital, Tokyo (M.M.); Division of Vascular Surgery, The University of Tokyo Hospital, Tokyo (M.M.); and Minamino Cardiovascular Hospital, Tokyo (J.M., S.M., Y.H.), Japan

Mailing address: Mitsuru Matsukura, MD, PhD, Division of Vascular Surgery, International University of Health and Welfare Mita Hospital, 1-4-3 Mita, Minato-ku, Tokyo 108-8329, Japan. E-mail: mitsuru.matsukura@gmail.com

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The patient, an 82-year-old woman who had been treated for atrial fibrillation, presented at hospital with sudden-onset bilateral leg pain. Computed tomography angiography indicated embolization of bilateral lower extremity arteries and the patient was diagnosed with acute limb ischemia (**Supplementary Figures 1,2**). In order to evaluate the ischemic status of the bilateral leg precisely, we used dual-energy dual-layer spectral computed tomography (IQon Spectral CT; Philips Healthcare, Cleveland, OH, USA) and calculated extracellular volume fraction (ECV) scores (**Supplementary Figure 3**).¹ ECV is considered to expand in association with diffuse muscle fibrosis or infiltrates. By calculating ECV score, we succeeded in distinguishing the necrotic status of the muscle objectively.

ECV score of the left thigh was well preserved whereas that of the below-knee area was markedly deteriorated

(**Figure**). Above-knee amputation was therefore performed under the guidance of this map.

Disclosures

The authors declare no conflicts of interest.

Reference

1. Lee HJ, Im DJ, Youn JC, Chang S, Suh YJ, Hong YJ, et al. Myocardial extracellular volume fraction with dual-energy equilibrium contrast-enhanced cardiac CT in nonischemic cardiomyopathy: A prospective comparison with cardiac MR imaging. *Radiology* 2016; **280**: 49–57.

Supplementary Files

Please find supplementary file(s);
<http://dx.doi.org/10.1253/circrep.CR-19-0083>