

Images in Cardiovascular Medicine



Image of Statin-Induced Rhabdomyolysis

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A 62-year-old male complained of generalized muscle weakness and pain. He had undergone percutaneous coronary intervention 1 month ago to treat ST-segment elevation myocardial infarction (STEMI). His levels of aspartate/alanine aminotransferase (AST/ALT), creatine kinase (CK), and myoglobin were markedly elevated: AST 1,323 (reference 10–37 U/L), ALT 476 (10–37 U/L), CK 52,784 (0–170 U/L), and myoglobin >20,000 (0–110 U/L). His renal function assessed via glomerular filtration rate calculation had deteriorated from 63 to 27 mL/min/1.73 m². The patient was diagnosed as rhabdomyolysis and underwent immediate massive hydration. On hospital day 5, bone scintigraphy employing Tc-99m hydroxymethane diphosphonate was performed; the blood pooling images revealed increased radioisotope uptake by both upper extremities and the thigh muscles (**Figure 1**). The patient had been prescribed a high-intensity statin (atorvastatin 40 mg/day) after STEMI treatment. After hydration and atorvastatin cessation, the CK and myoglobin levels gradually decreased.

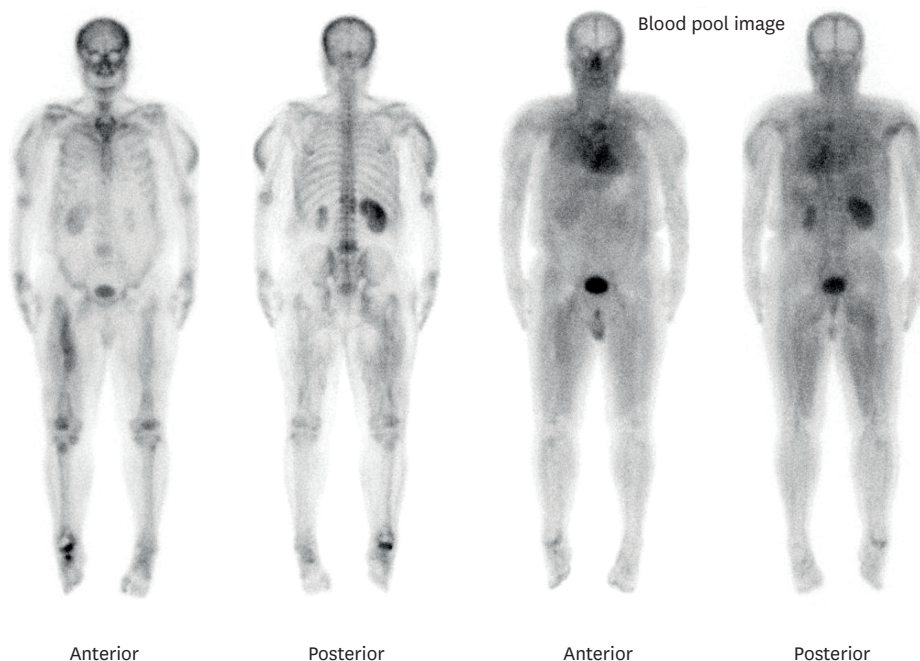


Figure 1. Bone scintigraphy using Tc-99m hydroxymethane diphosphonate revealed increased radioisotope uptake in both upper extremity and thigh muscles at blood pooling image.

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Conflict of Interest

The authors have no financial conflicts of interest.

Author Contributions

Conceptualization: Kim MC; Data curation: Kim MC, Ahn Y; Formal analysis: Kim MC, Ahn Y; Funding acquisition: Kim MC; Investigation: Kim MC; Methodology: Kim MC, Ahn Y; Project administration: Kim MC, Ahn Y; Resources: Kim MC; Software: Kim MC; Supervision: Cho KH, Sim DS, Hong YJ, Kim JH, Jeong MH; Validation: Cho KH; Visualization: Kim MC, Cho KH; Writing - original draft: Kim MC, Ahn Y; Writing - review & editing: Kim MC, Ahn Y.

On hospital day 20, the patient was discharged without muscular symptoms. The CK and myoglobin levels at discharge were 351 (reference 0–170 U/L) and 235 (0–110 U/L), respectively. The renal function and the AST/ALT levels were normalized. We prescribed pitavastatin 2 mg/day and ezetimibe 10 mg/day to replace the high-intensity statin.

Rhabdomyolysis is the worst form of statin-related myopathy, which is very rare.¹⁾ Diagnosis is based on the clinical situation and laboratory data, but bone scintigraphy using a bone-specific tracer can also be helpful to establish the diagnosis of rhabdomyolysis.²⁾³⁾ Especially, bone scintigraphy can distinguish non-traumatic rhabdomyolysis (such as statin-induced rhabdomyolysis) from traumatic rhabdomyolysis.⁴⁾

REFERENCES

1. Pedersen TR, Berg K, Cook TJ, et al. Safety and tolerability of cholesterol lowering with simvastatin during 5 years in the Scandinavian Simvastatin Survival Study. *Arch Intern Med* 1996;156:2085-92. [PUBMED](#) | [CROSSREF](#)
2. Sinzinger H, Staudenherz A, Haber P, Berent R. The myth of muscle uptake of Tc-99m bisphosphonate in bone scan because of rhabdomyolysis. *Nucl Med Commun* 2016;37:1334-6. [PUBMED](#) | [CROSSREF](#)
3. Huerta-Alardín AL, Varon J, Marik PE. Bench-to-bedside review: rhabdomyolysis -- an overview for clinicians. *Crit Care* 2005;9:158-69. [PUBMED](#) | [CROSSREF](#)
4. Esnault VL, Nakhla M, Delcroix C, Moutel MG, Couturier O. What is the value of Tc-99m hydroxymethylene diphosphonate scintigraphy for the etiological diagnosis of mild rhabdomyolysis? *Clin Nucl Med* 2007;32:519-23. [PUBMED](#) | [CROSSREF](#)