

An Incidental Finding of Rhabdomyolysis on Bone Scintigraphy: Case Report

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A patient with back pain had a technetium-99m methylene diphosphonate scan to rule out bony pathology to the spine. The bone scan demonstrated rhabdomyolysis involving the teres minor and major, as well as the infraspinous muscles on the right side and to a lesser extent in the triceps bilaterally. Upon interviewing the patient, it was discovered that the patient had begun a rigorous weight training program at a local gymnasium a few days previously.

J Nucl Med Technol 1993; 21:63-64

The visualization of damaged skeletal muscle with technetium diphosphonates is well documented. Excessive muscle exertion is a recognized cause of localization of bone-seeking radiopharmaceuticals in muscle (1). The technetium-99m (^{99m}Tc) phosphates are a good indicator of not only acute rhabdomyolysis, but can resolve the extent of tissue damage and recovery. Classically, rhabdomyolysis is a focal or generalized necrosis of skeletal muscle, which occurs in connection with a multitude of conditions. A focal form of rhabdomyolysis is often seen following trauma to a specific area or after extraordinary muscle exertion. A more generalized form of rhabdomyolysis is seen in many disparate types of cases, including: hyperthermia, ischemia or infarction, renal failure secondary to alcoholism, seizures, shock, or electrical burns.

CASE REPORT

A young man complaining of bone pain had a bone scan at the request of his physician. The patient had recently begun a rigorous weight training program at his gymnasium. There was no clinical indication of rhabdomyolysis.

Biplanar whole body bone scintigraphy, using ^{99m}Tc -methylene diphosphonate (MDP), was performed. Delayed whole body images showed focal distribution of ^{99m}Tc -MDP in the left posterior thoracic area, localized to the teres major

and minor, as well as to the infraspinous muscle (Fig. 1). There was also some uptake in the triceps muscle bilaterally (Fig. 2). The bone scan otherwise showed normal skeletal distribution of the radiopharmaceutical.

The patient denied injury or pain to this area but complained of some localized stiffness. He also noted that his muscle discomfort was due to a recent transition into a rigorous weight training program at his gymnasium.

DISCUSSION

This case demonstrates the role of bone scintigraphy in resolving focal rhabdomyolysis after muscle trauma. Bone scintigraphy with ^{99m}Tc -MDP is not only a sensitive indicator of muscle damage, but the amount of uptake is proportional to the extent of myonecrosis (2). In sports medicine, this could be a valuable tool in discriminating bone or muscle

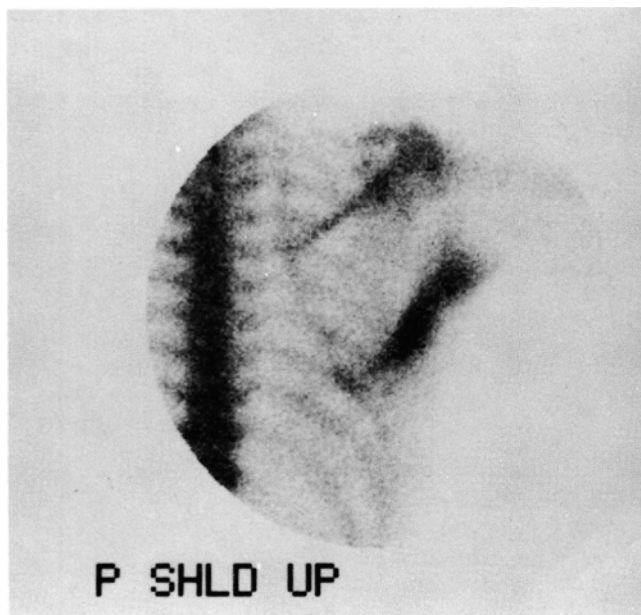


FIG. 1. Uptake of Tc-MDP in the teres major and minor, as well as the infraspinous muscle.

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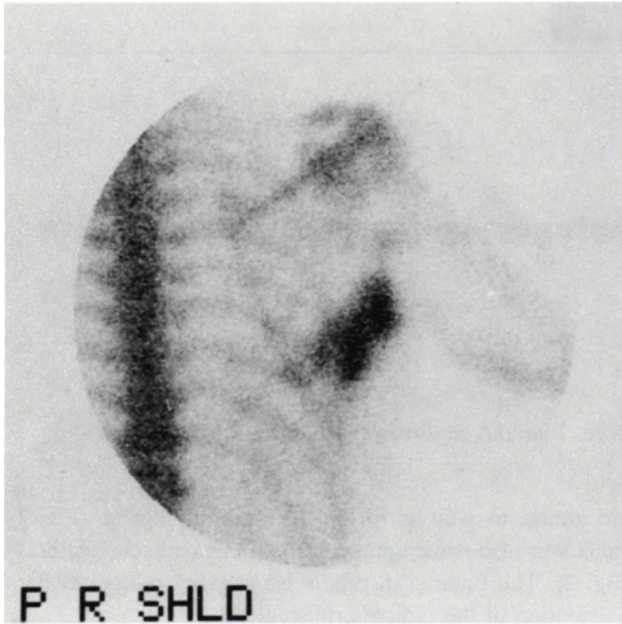


FIG. 2. Triceps muscle uptake of Tc-MDP.

trauma. In the evaluation of athletes with pain in the extremities, it is important to note that following strenuous exercise, such as jogging, muscle uptake may be noted, also due to rhabdomyolysis (3). The bone scan can be very helpful in cases where the localization of the muscle injury is not apparent on physical examination (2).

The method of uptake in rhabdomyolysis is probably similar to that of cardiac muscle. The uptake of technetium diphosphonates in acute myocardial infarction is due to the phosphates being attracted to the influx of calcium to these sites. Calcium in acutely damaged skeletal muscle has been found primarily in sarcoplasmic reticulum, with less in the myofibrils and considerably less in the mitochondria (4).

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