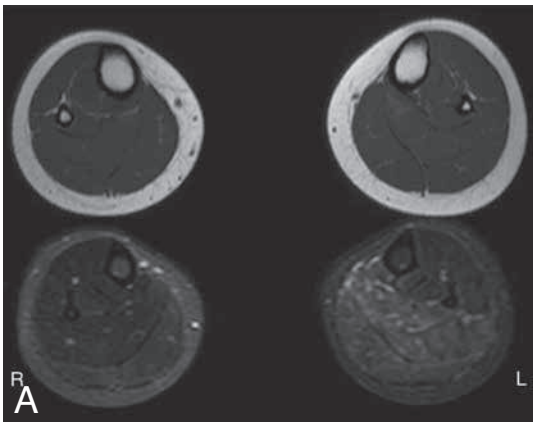
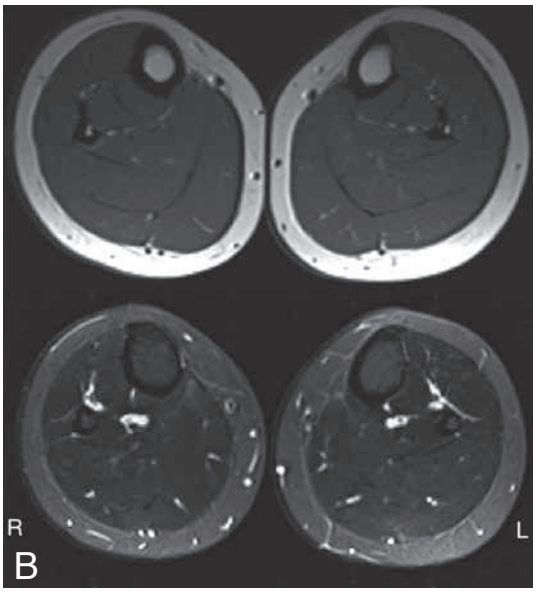
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IMAGES IN CLINICAL RADIOLOGY





Delayed onset muscle soreness

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A sportive young woman presents highly painful muscular soreness 48 hours after intensive physical exercise. A first MRI (Fig. A) of her legs is performed during the acute pain period (axial T1 and STIR weighted sequences), which shows on the STIR weighted sequence a diffuse high signal intensity of the muscles groups of the posterior compartment of the left leg (right side of image). Moderate high signal intensity is also showed in both gastrocnemius of the right leg (left side of image) (on the right on Fig. A). No abnormalities are shown on T1 in both legs.

A second MRI (Fig. B) of the legs is performed after disappearance of the pain 15 days later, with complete normalization of the muscle signal on both sequences (axial T1 and STIR weighted sequences).

Laboratory tests showed a moderate increase in muscle enzymes (Creatine Kinase) in acute phase with normalization 15 days later. Pressure measurements in muscular lodges are normal.

Comment

Delayed onset muscle soreness (DOMS) is a clinical entity characterized by heavy muscular pain appearing 48-96 hours after intensive physical exercise, who shows on histology microstructural damages (sarcomeres disorganization) et biologically increased Creatine Kinase enzyme.

MRI is the imaging modality of choice. STIR weighted sequence best shows high signal intensity zones in the involved muscle groups. The distribution of high signal intensity is multifocal and reaches the involved overused muscle groups, who can be very limited or extended and diffuse, in relation with the number of involved muscles. The intramuscular distribution of the high signal intensity is often diffuse in the muscle body.

A study (1) showed also a correlation between the degree of pain, the elevation of CK enzymes and the volume of muscle edema on MRI. The muscular high signal intensity disappear normally with the resolution of the symptoms, and give residual a normal pattern on MRI.

The differential diagnosis of DOMS is large and compatible with these of muscle edema: post-traumatic (strain, contusion, laceration, compartment syndrome), inflammatory (polyomyositis, necrotizing fasciitis, diabetic muscle infarction, sarcoïd myopathy), neuronal denervated muscular territory, post radiation.

The clinical context and the medical history and above all the complete return to normality on the MRI images correlated with the clinical status will orientate the diagnosis with DOMS.

Reference

1. Nurenberg P., Giddings C.J., Stray-Gundersen J.: MR imaging-guided muscle biopsy for correlation of increased signal intensity with ultrastructural change and delayed onset muscle soreness after exercise. *Radiology*, 1992, 184: 865-869.

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