A 19 year old active military recruit suffering from low back pain following trauma was referred for bone scintigraphy. Anterior and left lateral views (Figures 1 and 2) of the Tc-99m MDP bone scan showed intense radiotracer uptake over a large area of the anterior abdominal region at the rectus abdominis muscle, with several photopenic tendinous intersections transversed on the muscle. Questioning of the soldier revealed that he had performed vigorous sit-up exercises 2 days before the bone scan and that he felt pain in the anterior abdominal wall. In another case, a 43 year old man was referred for bone scan due to shoulder pain to exclude bone abnormalities. Posterior view (Figure 3) of the Tc-99m MDP bone scan revealed symmetric bilateral intense uptake posteriorly in the teres major muscles. No bone abnormality was seen. Further questioning revealed that he had recently performed heavy weightlifting.

Following extreme physical exercise, patients are often referred for bone scan to confirm or exclude over-use bone injuries such as stress fractures and shin splints. However, the bone scan occasionally provides a specific soft tissue diagnosis not initially suspected by the referring physician, as in these two rare cases. The cause of muscle uptake in both patients is rhabdomyolysis secondary to over-exertion. The proposed mechanism of radiotracer uptake is...
absorption to denaturated proteins and binding to mitochondrial calcium, which is increased in the damaged muscle cells [1]. Other causes of rhabdomyolysis include drug use, muscle trauma, exposure to toxins, infections, hyperthermia, seizures, and electrolyte abnormalities. The scintigraphic pattern reflects the specific muscle groups that sustained the injury [2–5].

References

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Capsule

Seeing malaria parasites infect cells

Malaria parasites (Plasmodium) are injected into the mammalian bloodstream by mosquitoes, and the sporozoites travel to the liver where they elude host immune responses and grow. Frevert et al. have taken a technically sophisticated approach to visualizing parasite infiltration of the liver in real time. Mosquitoes, infected with red fluorescent protein-labeled parasites, were continuously fed on a mouse engineered to express green fluorescent protein in cells of the liver sinusoids. Simultaneously, the mouse was held on the stage of a fluorescence microscope, and a lobe of the liver was exposed through the abdominal wall so that the route of the parasites could be monitored. The sporozoites could be seen to glide across the surface of the sinusoidal epithelial cells, to slow down and enter the Kupffer cells, and to use these as a bridge into the liver parenchyma. For up to 15 minutes, sporozoites traversed destructively through hepatocytes, leaving a trail of necrosis, until finally halting within a hepatocyte and replicating. During these journeys, parasites leave a trail of surface proteins, which tolerize the already immunologically lax Kupffer cells and hence help to shield the invader from host responses.

Eitan Israeli

Erratum

The picture on the cover of the August issue was inadvertently printed upside down. It appears correctly here. Also, permission to feature this picture was given by the artist, Suly Wolff, and not by Mechira Pumbit as printed.

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