Clinical history

A 52-year-old man had a tick bite with subsequent development of neuroborreliosis, for which he had been treated with a slow but gradual improvement, except for persisting peripheral polyneuropathy at the lower limbs. A half year later he presented with intense pain at his right first MTP joint, which had been classified in another hospital as gout, although hyperuricemia has never been proven. Another half a year later he presented with pain in the entire right foot, redness and extreme edema, he was unable to walk. At that time the patient was referred for MRI of the foot. We were asked to rule out osteomyelitis, phlegmona or synovitis of the talocrural or subtalar joints. Two weeks later we performed a CT-guided true-cut biopsy of several of his plantar muscles for both histological and immunologic examination. Soon after the patient started complaining of a dry exfoliating affection of the skin at his lower legs.

Findings on medical imaging

Fig. 1: Radiograph of the right foot. Mild osteoarthritic changes of the first MTP joint with a well defined small osteolytic lesion in the head of the metatarsal. Several other well defined osteolytic lesions can be found at other MTP and IP joints. The joint space and the subchondral cortical bone were mostly preserved, except for the mild narrowing of the first MTP joint space. There were no signs of osteomyelitis.

Figs. 2a-d: MRI of both feet. Edema (T2 FS-hyperintensity) and pronounced fatty degeneration (T1-hyperintensity) of the plantar, and to a lesser degree of the dorsal foot muscles. There was no signal alteration of the intermuscular or subcutaneous fat, that would suggest phlegmona, or in the bone marrow, that would suggest osteomyelitis. Fluid in the MTP joints and some of the tarsal joints was found, but there was only a non-significant small amount of fluid in the subtalar and in the talocrural joint. Only two of the osteolytic (T2 FS-hyperintense and T1-hypointense) lesions of the short bones were seen on the MR-images.

Brtkova J., Jirickova P., Kapla J., Dedic K., Pliskova L.
1. Department of Radiology, Faculty Hospital, Charles’ Univ., Hradec Kralove, Czech Republic
As we suspected the arthritis to be caused by borreliosis and the edema and fatty atrophy to be of the same etiology, we performed a tru-cut biopsy of the plantar muscles. The histology revealed focal neurogenic atrophy of the muscles and localized lymphocytic infiltrates. No spirochetes were visible, but PCR was positive for Borrelia chromosomal DNA. Subsequently the patient developed chronic skin lesions: chronic atrophic dermatitis, eczema and scabies. We concluded, that the patient was suffering from Borrelia arthritis and chronic myositis, accompanied by typical chronic dermatitis.

Comment

Borreliosis is an inflammatory disease, caused by the spirochetes Borrelia Burgdorferi, Borrelia afzelii, and Borrelia garinii (with endemic distribution). The spirochetes can be acquired by a tick bite and they have affinity to the extracellular collagen matrix. The infection by Borrelia can be divided into three stages and a post Lyme-disease syndrome:

Stage I: a flu-like disease, erythema migrans around the site of the tick bite and the activation of T and B lymphocytes in lymph nodes, which start producing Ig against host tissues.

Stage II: acute neuroborreliosis, acute cardiac borreliosis and acute musculoskeletal borreliosis – i.e. transitory acute synovitis and myositis due to the inflammation by Borrelia itself.

Stage III, extending into the post Lyme-disease syndrome: chronic persisting inflammation and postinflammatory changes: chronic neuroborreliosis, chronic cardiac borreliosis, chronic dermatologic disease and chronic musculoskeletal borreliosis – i.e. chronic synovitis, arthritis and myositis and autoimmune postinflammatory fibromyalgia (myopathy), caused no longer by Borrelia itself, but by immunocomplexes (containing IgG and IgM), by activated complement (through a complex protein C1q) and by activated lymphocytes, plasmatic cells and macrophages, all of them causing or helping to cause inflammatory infiltrates and focal necrosis of skeletal muscles – usually adjacent to joints with synovitis and adjacent to the skin lesions and usually in proximal muscles. At this stage spirochetes are seldom detectable in the muscles on histologic examination, but their DNA can sometimes be detected by PCR.

Key words

Borreliosis, myositis, arthritis, Radiography, MRI

References


Brtkova J.1, Jirickova P., Kapla J., Dedic K., Pliskova L.
1. Department of Radiology, Faculty Hospital, Charles’Univ., Hradec Kralove, Czech Republic