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Myositis Ossificans in a Patient with Subarachnoid Hemorrhage: a Case Report

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Background

Myositis ossificans is a benign ossifying lesion typically occurring within skeletal muscle. Myositis ossificans might occur through abnormal differentiation of fibroblasts into osteogenic cells, but the precise mechanism still needs to be understood. Soft tissue injury or repetitive minor trauma is thought to be a common cause. In a patient with a brain injury, the occurrence is rare.

Case Description

A 61-year-old male had a subarachnoid hemorrhage due to a ruptured anterior communicating artery aneurysm. He underwent a craniotomy with aneurysm clipping, and then he was transferred to our rehabilitation facility two months after a subarachnoid hemorrhage. He showed akinetic mutism and was unable to communicate. He had an intermittent high-spiking fever of unknown origin. C-reactive protein, procalcitonin, and D-dimer levels were elevated without definite clinical signs of infection for more than one month. Abnormal serum liver function tests, including AST/ALT 227/322 IU/L, alkaline phosphatase 713 IU/L, and gamma-glutamyl transpeptidase 407 IU/L, were also found. Venography of bilateral lower limbs using computed tomography was taken for differential diagnosis of venous thrombosis. There was no deep vein thrombosis, but inflammatory changes with string signs were found in the right vastus muscle (Figure 1).

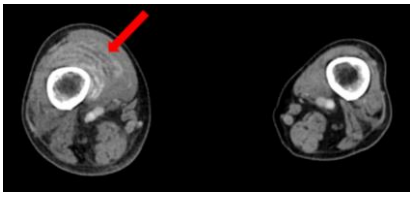

Figure 1. Computed tomography reveals round calcified lesions with a radiolucent center, suggesting 'string sign' in right vastus muscle.

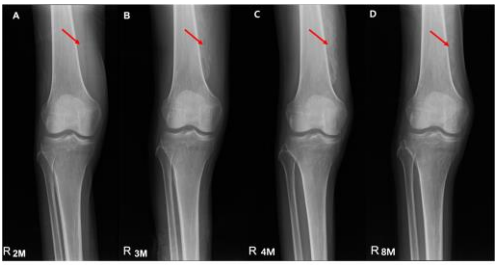

Figure 2. The radiopaque lesion is not seen at two months after subarachnoid hemorrhage (A) and appears in the right vastus medialis muscle at three months (B) and four months (C). Ossification is disappeared at eight months (D).

We performed the bone scan and plain X-ray (Figures 2A and 3A). The bone scan revealed profound radiotracer uptake in bilateral vastus medialis muscles, and faint radiopacity was shown around the right vastus medialis muscle. At this time, mild local heat and a bit of hard consistency around the vastus medialis muscles were first identified by medical staff based on bone scan findings. Serial plain X-ray revealed progression of ossification (Figure 2B and 2C). Indomethacin 25mg twice a day was administered and continued for a total treatment duration of one month. Eight months after the onset of subarachnoid hemorrhage, clinical signs of local heat and the bilateral vastus muscles' hardness disappeared. Also, the follow-up bone scan and plan X-ray demonstrated resolved state (Figures 2D and 3B).

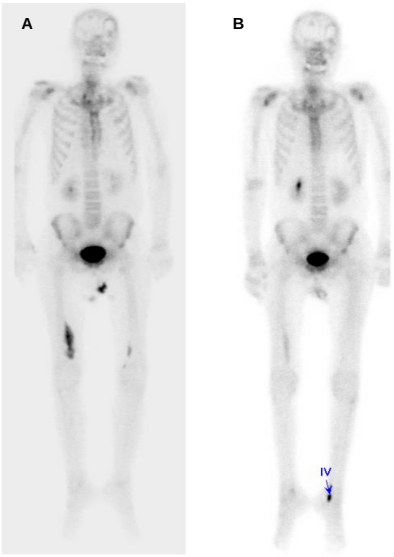

Figure 3. The bone scan shows profound radiotracer uptake in the right vastus medialis muscle, and faint uptake is noted in the left vastus medialis muscle two months after the subarachnoid hemorrhage. At eight months, the uptake is resolved.

Discussion

Common clinical symptoms and signs of myositis ossificans are decreased range of motion, local erythema, swelling, pain, and palpable soft-tissue mass. However, our patient with akinetic mutism could not complain of any symptoms, and clinical signs by local ossifying lesion were minimal. Imaging studies, such as ultrasonography, computed tomography, and magnetic resonance imaging, help diagnose myositis ossificans. The computed tomography showing string signs (round calcified lesions with a radiolucent center) can be diagnostic before the characteristic calcification pattern becomes radiographically detectable in plain X-ray. Myositis ossificans is often self-limiting and nonsurgical treatment, including COX inhibitors or radiotherapy, is preferred.

Conclusion

Myositis ossificans should be considered in a brain-injured patient with unexplained fever and elevation of serum alkaline phosphatase. The bone scan is helpful for early diagnosis of myositis ossificans, and the indomethacin treatment may be effective.