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Multimodality imaging approach to complex regional pain syndrome of the hand following herpes zoster

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Abstract

A 75-year-old man with well-controlled diabetes mellitus (type 2) developed a typical zoster rash over his right scapular region. Therapy included systemic valacyclovir and topic acyclovir. During follow-up a second painful herpetic rash appeared over his right hand. Therapy was integrated with codeine/acetaminophen. Both rash and pain improved but did not disappear. Three weeks later the patient complained of a strong pain and edema in his right hand. Pain was described as constant and deep, burning on the third finger. The right hand and the fingers were swollen; skin was warm, taut and glossy. Strength was reduced in the territory of the ulnar nerve. Serum analysis were normal. Ultrasonography (US) and magnetic resonance imaging (MRI) of both hands were requested. US showed diffuse thickening of the subcutaneous layers. MR demonstrated a small amount of fluid in the metacarpophalangeal joint of the thumb, diffuse soft tissue swelling, and intramuscular edema, more evident at the thenar eminence. Findings suggested complex regional pain syndrome (CRPS). The diagnosis was confirmed by patient's follow-up.

To the best of our knowledge this is the first time that both MRI and US were performed in a case of CRPS of the hand following herpes zoster. Since CRPS is possible in subjects with herpes zoster affecting the distal extremity and indicates increased risk for development of post-herpetic neuralgia (PHN) a correct diagnosis is mandatory to prevent such complication. Combined MRI and US examination may help clinicians making an early diagnosis especially when the syndrome appears as a relatively limited syndrome in which naturopathic pain/sensory abnormalities predominate.

Keywords: US; MR; CRPS; Herpes zoster; Hand

1. Introduction

Herpes zoster (HZ) is a painful, unilateral, dermatomal, vesicular rash caused by reactivation of the varicella zoster virus. Viral reactivation begins in the dorsal root ganglion and spreads both toward the spinal cord and along the peripheral nerves, determining intense inflammation and tissue damage [1].

Post-herpetic neuralgia (PHN) is the most common complication of HZ. This condition, defined as pain 3 months after rash onset, has an estimated incidence of 25% in subjects over the age of 50 years treated with antiviral drugs. Peripheral motor paresis and CNS disorders (meningitis, encephalitis, myelitis, cerebral angiitis and delayed hemiplegia) represent less frequent neurological complications [2]. Another complication which may occur following HZ reactivation is complex regional pain syndrome (CRPS). CRPS types I and II are clinical syndromes with a group of symptoms, including burning and aching pain, hyperalgesia or allodynia, edema, sudomotor, and vasomotor changes in the distal extremities. CRPS I most commonly occurs after soft tissue trauma to a limb, while CRPS II occurs after injury to a peripheral nerve trunk. Although this association was first described by Sudeck in 1901, little mention in the literature has been reserved to such condition. Only a few cases have been published and recent studies have referred to this situation as "CRPS-like symptoms" [3–10].

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Up to date CRPS remains a clinically challenging entity both in terms of accurate diagnosis and effective treatment. Awareness of CRPS is still poor, and this is demonstrated by the fact that an average 30 months pass until patients receive adequate therapy [11].

The purpose of our report is to describe the US and MRI appearances in a patient with CRPS of the hand following herpes zoster infection. We also suggest the possible role of these imaging techniques in making an early diagnosis.

2. Case report

A 75-year-old man with well-controlled diabetes mellitus (type 2) developed a typical zoster rash over his right scapular region. Therapy included systemic valacyclovir (1000 mg; 1 tablet 3 times per day) and topic acyclovir. Pain was treated with gabapentin, anti-inflammatory drugs, and vitamins. During follow-up a second painful herpetic rash appeared over his right hand. Therapy was integrated with codeine/acetaminophen (30/300 mg; 1–2 tablets every 6–8 h as needed). Herpetic rash slowly disappeared; pain and soft tissue edema improved but did not disappear completely. Three weeks later the patient returned complaining of an intense spontaneous pain and edema in his right hand. Grip strength was reduced in the fourth and fifth fingers. Pain was described as constant and deep, burning on the third finger, 50 out of 100 on the 0–100 mm pain visual analogue scale (0 mm, "no pain" and 100 mm, "worst pain imaginable"). At physical examination the right hand and the fingers were swollen, nails were less lucid than on the left unaffected side (Fig. 1); skin was warm, taut and glossy. An area of hyperalgesia and allodynia was present in the third finger area. There was weakness of the hand grip strength rated as 4 (minimum 0 and maximum 5); flexor muscles of the hypotenar eminence and intrinsic hand muscle were the most affected, but no muscle atrophy was noted. No tremors were present, but fine motor function was reduced. Passive movements of the hand were limited by edema. Nerve conduction study reported an increase motor and sensitive latency on the ulnar nerve. Serum analysis were normal, except to immunoglobulin G VZV.

Both ultrasonography (US) and magnetic resonance (MRI) imaging of both hands were requested. US was performed with a 17–5 MHz broadband liner array transducer (IU 22; Philips, Eindhoven, the Netherlands) placing the probe in different positions on the volar and dorsal aspect of the hand and fingers. A large amount of gel was interposed between the skin and the transducer to avoid that the pressure of the probe could modify the real thickness of the subcutaneous tissue. Repeated measurements of the subcutaneous tissue in different anatomic sites demonstrated increased skin thickening on the affected side (Fig. 2). The appearance of the ulnar nerve was normal.

Fig. 1. Photograph of both hands demonstrates edema of the right hand with a taut and glossy skin especially on the fingers.

MRI was obtained with a 1.5 T equipement (MAGNETOM Avanto Syngo MR 2004V, Siemens AG, Erlangen, Germany) using: T1-weighted spin-echo, T2-weighted with fat saturation turbo spin-echo and STIR (short tau inversion recovery) sequences. Images were obtained on axial planes. In the affected side diffuse soft tissue and subcutaneous edema were demonstrated in both T2 fat-suppressed and STIR sequences (Fig. 3). Others findings were small intraarticular effusions at the first metacarpophalangeal joint and intramuscular edema more evident at the thenar eminence. Infections, large fluid collections or unilateral vascular occlusive disease were excluded. Plain radiographs were normal. Contrast agent was not injected because the patient refused. Symptoms and imaging findings suggested complex regional pain syndrome (CRPS). Pain was treated with analgesic (acetaminophen 500 mg) and gabapentin. The patient received physical therapy for soft tissue edema. Aggressive therapy such as nerve block techniques was suggested, but the patient refused. After 2 months of therapy hand edema started to decrease but pain persisted. Other signs of CRPS were not present at this time. At this time the diagnostic criteria for post-herpetic neuralgia (PHN) were present: persistent pain without any signs of CRPS [12]. Support therapy for this condition was suggested. The patient was contacted via telephone 3 months later. He referred that pain had greatly decreased although not completely disappeared.