

An Unusual Presentation of Herpes Simplex Virus Type 1 Infection in a Child

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Key Words

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Abstract

We describe an 11-year-old girl presenting with lichen simplex chronicus (LSC) and acute bilateral carpal tunnel syndrome (CTS) following herpes simplex virus type 1 (HSV-1) infection as evidenced by serological data and by detection of HSV-1 DNA in the blood with the use of PCR. Based on the literature search, this case represents the first childhood case of LSC and acute bilateral CTS following HSV-1 infection. The experience with this patient emphasizes the importance of serological tests and PCR as well as the other laboratory techniques for the accurate diagnosis and management of the disease.

Introduction

The herpes family of viruses includes 8 separate species that infect humans: herpes simplex virus 1 (HSV-1), herpes simplex virus 2 (HSV-2), varicella zoster virus, Epstein-Barr virus, cytomegalovirus, human herpesvirus 6 (HHV-6), human herpesvirus 7 (HHV-7) and human herpesvirus 8 (HHV-8). These viruses account for a significant proportion of human cutaneous diseases and they cause similar histological and clinical findings [1]. Although herpes labialis, herpes vulvovaginitis, herpetic whitlow and herpes gladiatorum are the most well-known clinical features of the HSV-1 and HSV-2 infections, there are various descriptions of herpesvirus involvement in erythema multiforme, atopic dermatitis, lichenoid dermatitis and seborrheic keratosis [2–6]. Lichen simplex chronicus (LSC) and acute bilateral carpal tunnel syndrome (CTS) are unusual complications of herpesviruses, and

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apparently a few cases of adult patients have been reported previously [7–9]. We describe an 11-year-old girl with LSC and acute bilateral CTS following HSV-1 infection.

Case Report

An 11-year-old girl was admitted with recurrent fever, pain and swelling of her right wrist and proximal phalanx, and relapsing painful, itchy lesions consisting of erythematous papules with excoriations and crusting on the skin with a central hyperpigmentation, mostly distributed on the neck, face, legs and hips. Her medical history was significant for a 6-month period of recurrent lesions, always involving the same parts of her body and preceded by severe pain and hyperesthesia on 1 side of her entire body (sometimes right, sometimes left), with a frequency of 3 times a week. She described that both of her wrists, especially the right one and proximal phalanx had become tender and swollen at the same time as the appearance of the skin lesions. Up to this time, she had been diagnosed with atopic dermatitis and eczema and treated with various medicines such as systemic antihistamines, local and systemic corticosteroids and/or analgesics and antipsychotics but showed no improvement.

On physical examination, she had both old and new skin lesions at the same time on different parts of her body, particularly on the cheeks, neck, extremities and hips. Maculopapular lesions with brown hyperpigmentation were considered to be the old ones. Most of the new painful and itchy erythematous papules with excoriations revealed lichenification. Her right wrist and proximal phalanx were tender and swollen. Her fundus investigation revealed no abnormality and systemic examination was otherwise unremarkable.

Laboratory investigations revealed no abnormality of counter blood cell, erythrocyte sedimentation rate, C-reactive protein and fibrinogen. Her hepatic and renal functions revealed normal patterns and urinalysis showed no abnormality. Immunoglobulin levels of IgA, IgG and IgE were within the normal range, but IgM showed an elevated pattern. Viral hepatitis (A, B, C), Epstein-Barr virus, cytomegalovirus, HSV-2, human immunodeficiency virus, parvovirus B19, Lyme serologies, *Salmonella* and *Brucella* agglutinations, organ- and tissue-specific autoimmune antibodies (especially antinuclear antibodies), rheumatoid factor, cryoglobulins and ENA test were all negative. Antineutrophil cytoplasmic antibodies assay (ANCA) showed a negative pattern for both p-ANCA (perinuclear staining) and c-ANCA (cytoplasmic staining). The C3 level was 107 mg/dl (normal 80–150) and C4 was within the normal range at 22 mg/dl (normal 20–50). Specific IgE tests involving milk, egg, mold allergy, grass allergy, dog epithelium, house dust allergy, cat-specific IgE and weed panel were also negative. Cranial MRI was performed in order to reveal the reason for her neurologic symptoms but showed no abnormality. The creatine kinase level was within the normal range at 107 U/l (normal 22–240) and an electroneuromyographic investigation revealed moderate delay in distal sensory-motor latencies of both median nerves, with delayed median nerve F-responses on both sides. Serological tests showed positive HSV-1 specific IgM and HSV-1 DNA was detected in the patient's serum by using PCR. Tzanck smear was negative. A punch skin biopsy specimen from the right upper extremity showed hyperkeratosis with areas of parakeratosis, overlying an acanthotic epidermis with irregular elongation of the rete ridges. Chronic perivascular inflammatory infiltrate and fibrosis were also seen in the papillary dermis, but immunofluorescence studies were all negative (fig. 1, fig. 2).

Postherpetic LSC and acute bilateral CTS associated with HSV-1 infection were considered and high-dose acyclovir treatment (30 mg/kg/day i.v. for 5 days), 10 mg/kg/day naproxen sodium and high doses of vitamin B1, B6 and B12 combinations were started immediately. A dramatic improvement was observed on her neurologic symptoms and skin lesions within a few weeks. During her follow-up, neither adverse effects due to high-dose acyclovir treatment nor any other new lesions were observed. She had also been given topical anesthetics for the treatment of her postherpetic neuralgia. A control PCR was negative and serological tests showed a negative pattern for HSV-1 IgM and a positive pattern for HSV-1 IgG in the first month of her follow-up. Forty-five days after the initial acyclovir treatment she went to the seaside for summer holiday and a few days later she was readmitted with swelling of the proximal phalanx of her right hand and a new skin lesion on her right hip (fig. 3); these symptoms were preceded by severe pain and hyperesthesia in the right half of her entire body. A new PCR showed a positive pattern again, but serological tests revealed a negative pattern for HSV-1 IgM and a positive pattern for HSV-1 IgG. A new viral shedding was thought to be responsible and oral acyclovir (30 mg/kg/day) treatment was given for 2 weeks. Afterwards, she had continued the therapy at a dose of 10 mg/kg/day for 2 weeks. The skin lesion on her right hip and swelling of the joints resolved within a few weeks and PCR became negative again. We discontinued the therapy and follow up the patient monthly. Thus far, 10 months have passed without any new skin lesions.

Discussion

LSC (circumscribed neurodermatitis) is an idiopathic disorder characterized by the presence of 1 or more erythematous, scaling, lichenified plaques with varying degrees of overlying excoriation. In cases of long-standing duration, areas of hyper- and hypopigmentation may also be present. In almost all instances, lichenification represents the most dominant clinical feature. The most common sites are the neck (sides), ankles, scalp, vulva, pubis, scrotum and extensor forearms. The peak of incidence is between 35 and 50 years of age, and women are more affected than men (F:M = 2:1). Atopic individuals are more prone than others to develop LSC. Severe and intractable itch is the predominant symptom in nearly all patients and is characterized by paroxysmal attacks [10–12].

Acute clinical presentation of Herpesviridae is often secondary to active virus replication and host immune response, but resolution of symptoms does not herald clearance of the virus. LSC is an unusual complication of herpesviruses; however, there are a few reports of postherpetic pruritus in adult patients. Liddel [7] reported a patient with severe pruritus after a herpes zoster infection, Gerritsen et al. [8] reported a patient with LSC following herpes zoster infection of the scalp and Darsow et al. [9] described a patient with circumscribed pruritus which started 5 years after herpes zoster in the same dermatome.

Either clinically or pathologically there were no classical skin lesions of the HSV-1 infection in our patient. But positivity of the serological tests and detection of HSV-1 DNA by PCR and the patient's response to the acyclovir treatment suggested that LSC developed in this patient as a complication of recurrent viral shedding of HSV-1. It was difficult to distinguish whether the exact cause of the pain was postherpetic neuralgia or increasing stimulation that may produce itch and pain, as these sensations share the same neuroanatomical substrate [13].

We thought that the biopsy taken from the margin of the main lesion and differentiation of herpetic lesions to LSC may be related to the rubbing and scratching. On the other hand, it is known that there is a potential relationship between ultraviolet light and recurrent herpes

simplex infections. Viruses can reactivate from the latent state in neurons to form recrudescing lesions due to exposure to sunlight [14, 15]. The occurrence of a new lesion after the summer holiday in this patient was thought to be the result of exposure to ultraviolet irradiation which led to a new viral shedding.

CTS is one of the most common peripheral compression neuropathies, but it is rarely seen in children [16]. Many aspects of its etiology are not at all clear, and it is often termed idiopathic; however, it has also been attributed to a variety of underlying disorders and processes and secondary to infectious diseases [17–19]. Childhood CTS often has an unusual presentation, with modest complaints and children are often too young to communicate their problem [16]. In our patient, pain and swelling of the wrists and proximal phalanx was thought to be associated with the mechanical entrapment of the median nerves in relation to acute arthritis during the viral shedding of HSV-1. The rapid response to non-steroid anti-inflammatory drugs and high doses of vitamin B1, B6 and B12 combinations, tends to support this hypothesis.

In conclusion, this is an unusual childhood case of HSV type-1 infection complicated by LSC and acute bilateral CTS during viral shedding. The experience with this patient emphasizes the importance of serological tests and PCR as well as the other laboratory techniques for the accurate diagnosis and management of the disease.

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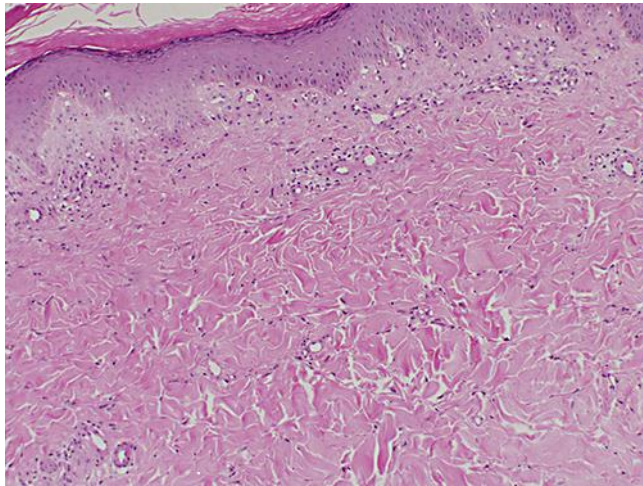


Fig. 1. Elongated rete ridges and prominent fibrosis.

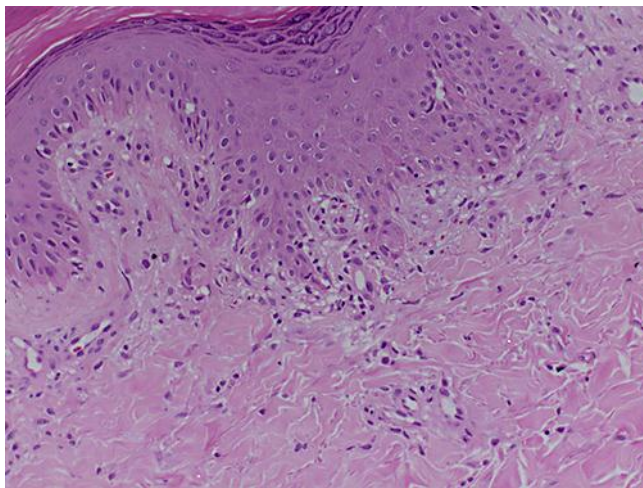


Fig. 2. Prominent irregular acanthosis with varying length of rete ridges, hyperkeratosis and superficial perivascular lymphocytic infiltrate.



Fig. 3. New lesion on the right hip after summer holiday.