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Case report

Disseminated VZV infection and asymptomatic VZV vasculopathy after steroid abuse

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ABSTRACT

A 60-year-old man who abused corticosteroids developed thoracic-distribution zoster. Varicella zoster virus (VZV) DNA was found in non-healing skin 3 months later. He died suddenly 2 months later. Skin was ulcerated and necrotic. VZV was widespread in organs and arteries, particularly coronary arteries and aorta, with VZV vasculopathy in the posterior cerebral artery.

1. Why this case is important

Primary infection with VZV usually results in varicella, after which virus becomes latent in cranial nerve ganglia, dorsal root ganglia and autonomic ganglia along the entire neuraxis. VZV reactivation in elderly and immunocompromised individuals causes herpes zoster and other neurological diseases, including stroke (VZV vasculopathy). Zoster is also associated with an increased risk of myocardial infarction [1].

Herein is a case of sudden death in a zoster patient who abused steroids. Autopsy revealed VZV dissemination and asymptomatic VZV vasculopathy.

Extensive VZV infection in cardiovascular structures may have produced a cardiac arrhythmia that led to sudden death.

2. Case description

In August 2013, a 60-year-old man developed right-sided T6-7 distribution zoster. He was treated with valacyclovir and oral prednisone, taken near-continuously for pain relief. Zoster lesions below the right nipple (Fig. 1A) and in the same posterior dermatome (Fig. 1B) became ulcerated and did not heal, and VZV DNA was detected by PCR 3 months later. For 7 years before zoster, he self-administered corticosteroids repeatedly for ill-defined musculoskeletal aches; from 2011–2013, he consumed at least 13 prednisone packs (20–50-mg tablets/pack). He died suddenly 5 months after zoster without known preceding chest or arm pain, dizziness, syncope, nausea, vomiting or other neurological symptoms.

2.1. Postmortem findings

At autopsy, the heart was hypertrophic with focal fibrosis of the posterior left ventricular wall. There was patchy, mild, non-stenotic atherosclerosis of the coronary arteries without arteritis. The brain was slightly edematous without inflammation, infarction or hemorrhage. All arteries of the circle of willis were mildly atherosclerotic. Grossly, the right posterior cerebral artery was moderately narrowed; histopathology showed fibrinoid necrosis of the media, disruption of the elastic lamina, intimal proliferation and transmural mononuclear cell inflammatory infiltrates with multinucleated giant cells and Cowdry A inclusion bodies (Fig. 1C).

Abbreviations: IE, immediate-early; TSG, thoracic sympathetic ganglia.

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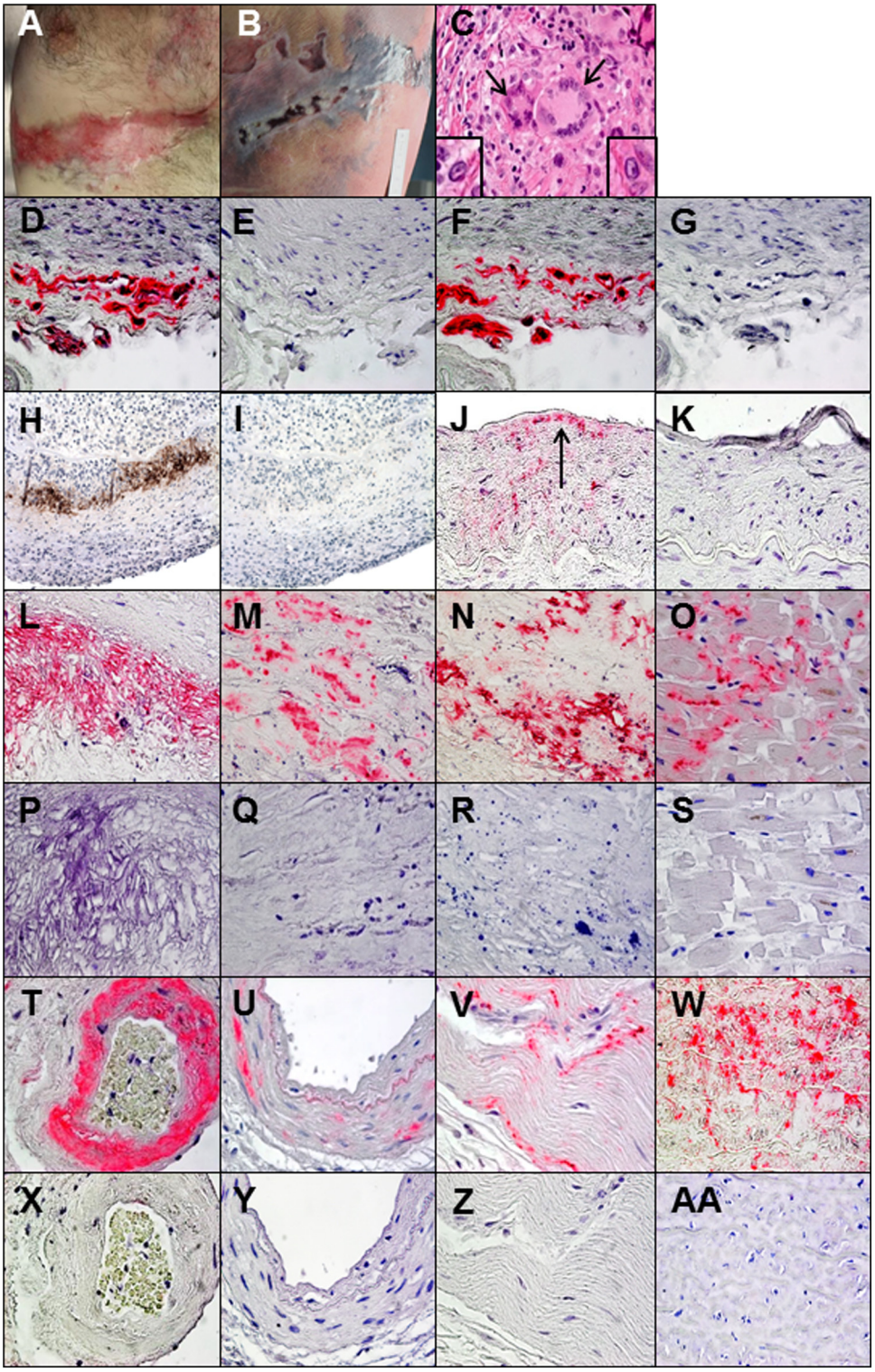

Fig. 1. Postmortem examination showed linear T6-7 distribution scarred lesions at the site of earlier zoster just below the nipple (A) along with ulcerative necrotic lesions in the same dermatome on the back (B) that were confirmed by PCR to contain VZV. In the right posterior cerebral artery, hematoxylin and eosin staining revealed inflammation and 2 giant cells (C, arrows) in the media adjacent to the disrupted internal elastic lamina, as well as Cowdry A inclusion bodies (C, insets). To confirm the specificity of binding to VZV antigen, immunoperoxidase and immunohistochemical staining were performed with 3 different anti-VZV antibodies. Immunohistochemical staining of a positive control VZV-infected cadaveric cerebral artery with mouse anti-VZV gE IgG1 antibody revealed VZV antigen (D, pink color) that was not seen with mouse isotype IgG1 antibody (E). Immunostaining of the same artery with rabbit anti-VZV IE 63 antibody also revealed VZV antigen (F, pink color) that was not seen with normal rabbit serum (G). In the right posterior cerebral artery, immunoperoxidase staining with a mouse anti-VZV antibody directed against multiple VZV antigens revealed virus in the arterial media (H, brown color) that was not seen when anti-HSV antibody was substituted for anti-VZV antibody (I). Immunohistochemical staining with mouse anti-VZV gE IgG1 antibody also revealed VZV antigen in the thickened arterial intima (J, arrow) that was not seen when adjacent sections were immunostained with mouse isotype IgG1 antibody (K). All other arteries and tissues were immunostained with mouse anti-VZV gE IgG1 antibody, and the presence of VZV antigen in some tissues was confirmed with rabbit anti-VZV IE 63 antibody. Immunostaining with mouse anti-VZV gE IgG1 antibody revealed viral antigen in the media of the aorta (L), the thickened intima of the left anterior descending coronary artery (M), the proximal left circumflex coronary artery (N), the bundle of His (O), the intima and media of an artery adjacent to the adrenal gland (T), the media of the renal artery (U) and the ileum (V), that was not seen when adjacent sections were immunostained with mouse isotype IgG1 antibody (P–S and X–Z). Immunostaining with rabbit anti-VZV IE 63 antibody revealed VZV antigen in sections of the aorta adjacent to that shown in panel L (W), which was not seen when adjacent sections were immunostained with normal rabbit serum (AA). 600X magnification.