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CASE PRESENTATION 1

Case Presentation 1:

Catastrophic Parvovirus B19 Endothelialitis in an Immunocompetent Host

This educational series
for physicians is presented by
the Weill Cornell Comprehensive
Dermatopathology Service

***E**xcellence in Academic*
and Diagnostic Dermatopathology

Catastrophic Parvovirus B19 Endothelialitis in an Immunocompetent Host

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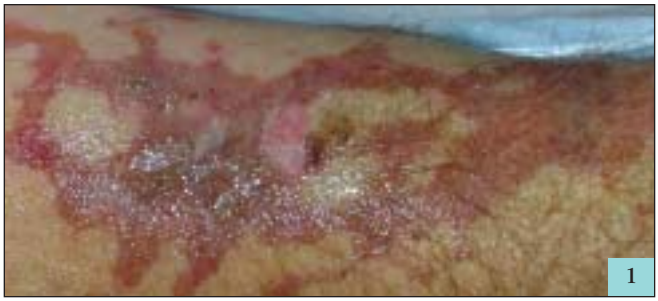
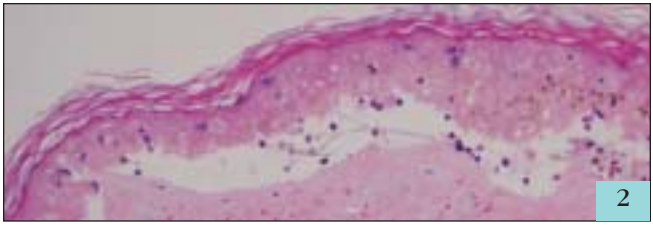
Case History

The patient was a 38 year old drug enforcement officer who presented with abdominal pain nausea and diarrhea on 12/9/06. Upon admission he was found to be neutropenic, thrombocytopenic and anemic . Upper GI series results were compatible with gastritis. He was subsequently transferred to another hospital for further evaluation. At this point in his clinical course the patient developed fevers up to 103 degrees fahrenheit. There was a further decrement in his white blood count to 2.0. Due to his cytopenia a bone marrow biopsy was performed. The results of the bone marrow are unavailable.

He was transferred to another hospital because of worsening cytopenias, persistent fevers and the onset of renal failure. Due to persistent abdominal symptoms he had a repeat CAT scan of the abdomen revealing intestinal ischemia. He then developed respiratory failure. On 12/18/06 he was transferred to NewYork-Presbyterian Hospital/Weill Cornell Medical Center for further management. He had persistent fevers and a continued deterioration in his renal status. He developed striking elevations in his CPK levels consistent with myositis. His white blood count declined to .8. Mottling of his arm developed (figure 1).

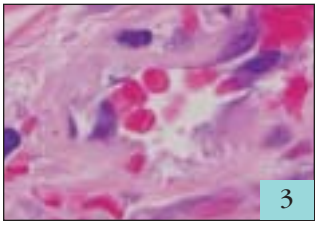


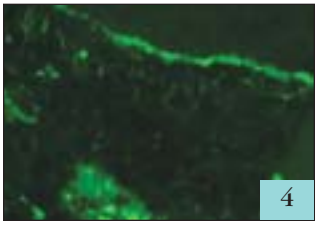
The skin is remarkable for a reticulated weeping erythematous to bronzy appearing plaque with superficial ulceration.



There is a pauci-inflammatory pattern of epidermal and dermal necrosis.

A skin biopsy was performed. The biopsy was remarkable for a striking ischemic alterations of the epidermis, dermis and eccrine coil (figure 2). There was a thrombogenic vasculopathy unaccompanied by any discernible inflammatory cell infiltrate. The endothelial cells showed prominent degenerative and regenerative changes (figure 3). There was detachment of the endothelium from the vascular lumens. Many of the cells revealed significant cellular enlargement whereby the nuclei demonstrated an effaced chromatin pattern. Direct immunofluorescent studies showed prominent staining of the endothelium for C5b-9 (figure 4).





Left: The vessels show severe degenerative and regenerative endothelial cell changes. Right: There is prominent deposition of C5b-9 along the dermal epidermal junction and within blood vessels.

A diagnosis was made of a catastrophic endothelial cell injury syndrome. Given the extent of cytopathic changes in the endothelium a viral based etiology was favored specifically one attributable to B19 or cytomegalovirus. Subsequent investigations revealed an active B19 viremia and as well B19 RNA in situ studies showed staining of the endothelium for parvovirus B19. The patient was treated with intravenous gamma globulin and improved significantly. A post treatment biopsy of his affected skin showed a significant reduction in the extent of erythema and surface undermining.

There is a significant improvement in the appearance of the skin lesion following intravenous immunoglobulin.

Discussion

The patient presented with progressive multiorgan failure and progressive profound cytopenia. Given the CNS, skin, gut and muscle involvement attributable to ischemia, the patient had an overall clinical presentation resembling acute accelerated Degos disease. Parvovirus B19 is tropic to a variety of human cells through the P receptor alternatively named globoside. Among the cells which can be effectively destroyed by the virus are endothelial cells, neutrophils, erythrocytes and platelets. In this particular case, the multiorgan ischemic injury along with the cytopenias could be explained by the specific cellular tropism of the virus. B19 has been associated with specific autoimmune based microvascular injury syndromes including scleroderma and dermatomyositis. Viral endothelial cell parasitism leading to accelerated endothelial cell apoptosis with the induction of neoantigens is likely of pathogenetic importance. In virally triggered dermatomyositis the treatment of choice is intravenous gamma globulin, an excellent source of pooled B19 specific antibodies. Parovirus' familiar with due to its association with a variety of serious conditions that can manifest with skin involvement. In addition to scleroderma and dermatomyositis, B19 has been asociated with Henoch-Schonlein Purposa, Kawasaki's Disease, Wegener's Granulomatosis, microscopic polyarteritis lupus-like symptoms and a reactive arthropathy closely resembling rheumatoid arthritis.

References

Magro CM, Nuovo G, Ferri C, Crowson AN, Giuggioli D, Sebastiani M. Parvoviral infection of endothelial cells and stromal fibroblasts: a possible pathogenetic role in scleroderma. J Cutan Pathol. 2004 Jan;31 (1):43-50.

Crowson AN, Magro CM, Dawood MR. A causal role for parvovirus B19 infection in adult dermatomyositis and other autoimmune syndromes.J Cutan Pathol. 2000 Nov;27 (10):505-15.

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Dermatopathology Service

This educational series of monthly case presentations is presented by the Weill Cornell Comprehensive Dermatopathology Service.

Under the direction of Dr. Cynthia M. Magro, the Weill Cornell Comprehensive Dermatopathology Service is a leading-edge consultation service and CAP-accredited laboratory for dermatologists, plastic and general surgeons and other dermatopathologists. Dr. Magro is an internationally renowned dermatopathologist, educator and author. She is a Professor of Pathology and Laboratory Medicine at the Weill Cornell Medical College in Manhattan, and is board certified in anatomic pathology, dermatopathology and cytopathology. Dr. Magro is an expert in the diagnosis of complex inflammatory skin diseases. Her areas of expertise include cutaneous manifestations of autoimmune disease, systemic viral disease and vasculitis, atypical drug reactions, benign, atypical and overtly malignant lymphocytic infiltrates of the skin, and diagnostically difficult melanocytic proliferations. The award-winning author of *The Melanocytic Proliferation: A Comprehensive Textbook of Pigmented Lesions*, Dr. Magro has recently completed her second book, *The Cutaneous Lymphoid Proliferation*, a comprehensive textbook on benign and malignant lymphocytic infiltrates. She has co-authored over 170 peer reviewed papers and several textbook chapters. Dr. Magro frequently presents courses on inflammatory skin pathology and difficult melanocytic proliferations to the American Academy of Dermatology, the United States and Canadian Academy of Pathology, and the American Society of Clinical Pathology.

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