

# Splenic vascular thrombosis in an immunocompetent host due to Cytomegalovirus Infection.

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## Abstract

Cytomegalovirus (CMV) associated vascular thrombosis is an rare but increasingly reported phenomenon and should be considered in the differential diagnosis of splenic infarction once more common diagnoses, such as endocarditis and lymphoma have been excluded. We present a case of a previously healthy, immunocompetent African American woman with acute CMV infection complicated by vascular thrombosis resulting in splenic infarct.

## INTRODUCTION

Acute cytomegalovirus (CMV) infection in an immunocompetent patient is usually asymptomatic or may present as a syndrome resembling infectious mononucleosis<sup>(1)</sup>. It can also cause life-threatening conditions such as pneumonitis, retinitis, colitis and encephalitis<sup>(2)</sup>. However, these occur in immunocompromised patients and neonates. We present a case of a previous healthy immunocompetent African American woman with acute CMV infection complicated by vascular thrombosis in the form of splenic infarction.

## CASE PRESENTATION

A 35-year-old female presented to the Emergency Department (ED) with chief complaints of neck pain and abdominal pain. The neck pain was associated with photophobia and slight occipital headache and had been managed on the outside by her primary care physician with non-steroidal anti-inflammatory drugs without relief. Recently a few days back she had also noticed anorexia, nausea, chills, myalgias, and extreme fatigue with a recorded temperature of 102 degrees Fahrenheit. Examination revealed a slightly distressed female with a temperature of 101 degrees, heart rate of 120 beats per minute, blood pressure of 110/65 mm Hg, respiratory rate of 18 breaths per minute and saturating 96% on room air. She had diffuse tenderness all over the body, even to the touch of the stethoscope. A positive neck stiffness, Kernig's and Brudzinski's signs were elicited in the ED, without any demonstrable neurological deficits. Her lungs were clear, heart was without murmurs or rubs and abdomen was

diffusely tender to palpation but without rebound and bruits. Initial laboratory work showed a white count of 6.4 K/UL with 48% neutrophils and 38% lymphocytes, hemoglobin of 8.5 G/DL (MCV of 68.6 FL), normal platelet count and a completely normal comprehensive metabolic panel including normal amylase and lipase. Erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) were elevated at 58 mm/hr and 8.79 MG/DL. A lumbar puncture performed in the ED was negative for meningitis (D-dimer in the CSF was negative as well) and initial CT of the head in the ED was negative for any intracranial pathology.

The patient next had an MRI of the cervical spine and brain both of which returned negative results. Meanwhile the patient continued to have intermittent fever in the range of 100.4 to 102 degrees Fahrenheit over the next 3-4 days at which time she now increasingly started to complain of severe left upper quadrant pain and left shoulder pain. An ultrasound of the abdomen showed gallstones and splenomegaly (13.3 cm). At this time diagnostic tests were sent for Epstein bar virus (EBV), cytomegalovirus (CMV), toxoplasma, human immunodeficiency virus (HIV), collagen vascular disease, and vasculitis. Meanwhile, blood cultures drawn in the ED and successively after that continued to show no growth. CT of the abdomen was ordered which showed marked splenomegaly with a wedge shaped lucency in the periphery of the upper pole consistent with an acute splenic infarct. A hypercoagulable state was considered and tests were sent. A transeophageal echocardiogram did not show any vegetation. The results of the serological testing showed that CMV IgM and IgG levels were elevated to 2.31

and 1.65 UA/ml (normal <1.10 UA/ml) respectively. A CMV pp67 antigenemia assay was positive. The results of the HIV ELISA, IgG and IgM anti HSV (herpes simplex virus), parvo virus B19, lyme disease and toxoplasma were negative while the patient was positive for IgG anti EBV but negative for IgM anti EBV. Monospot test was negative. Evaluation for vasculitis revealed normal complement levels and no cryoglobulins and immunologic test results were negative for DRVVT (diluted russel viper venom time), anti nuclear antibodies, anti Smith, anti-double-stranded DNA, anti RNP, anti Ro (SSA), anti La (SSB), rheumatoid factor and hypercoagulable state (normal prothrombin time, thromboplastin time, protein C and S activity, homocysteine levels, antithrombin III levels, no factor V Leiden R506Q and prothrombin gene G20210A mutation and normal lipoprotein a levels). Anti-phospholipid antibody as well as sickle cell screen was negative. The patient improved with supportive therapy and was discharged home.

### DISCUSSION

Acute CMV infection in the immunocompetent host is a classically benign clinical entity. The majority of cases are either asymptomatic or present as an infectious mononucleosis like syndrome. In this case we report acute CMV infection presenting as a vasculopathy. This is a rare but increasingly reported phenomenon. A recent review of the world literature identified only 18 cases in patients with functioning immune systems.

Amongst this heterogeneous group of cases, vasculopathy predominantly affected the portal, mesenteric or pulmonary vasculature. Only few cases report splenic vasculature thrombosis and infarction have been reported (3, 4, 5).

In our case, the initial presentation was unclear. The predominant clinical signs were intermittent fever, diffuse body tenderness and left upper quadrant pain with positive Kehr's sign. Following the demonstration of acute splenic infarction on CT of the abdomen, the differential remained wide. The differential diagnosis of unexplained fever and acute splenic infarction includes viral infectious causes such as acute EBV and acute CMV, infectious vasculitis as observed in neisserial infections; underlying myeloproliferative disorders such as Polycythemia rubra vera (PCV); underlying hemoglobinopathy especially sickle cell disease; embolic disease such as bacterial endocarditis; and underlying hypercoagulable states such as malignancy and antiphospholipid syndrome (3,4,5). Our patient received extensive negative work up for these conditions and in this

context was found to have acute CMV infection with elevated CMV IgM and positive CMV antigen. The mechanism by which CMV causes vasculopathy is poorly understood. Review of the reported cases reveals a number of hypotheses including direct damage to the vascular endothelium (3, 6); upregulation and expression of antiphospholipid antibodies (3, 7) upregulation of endothelial adhesion molecules (8, 9,10); cytokine immune induction (11); and alterations in vascular smooth muscle proliferation and migration resulting in initial plaque formation (12). Collectively either one or a combination of these mechanisms is thought to trigger a cascade of events favouring vascular thrombosis.

In conclusion, we are presenting a case of acute CMV infection complicated by splenic infarction. CMV associated vascular thrombosis is a rare but increasingly reported phenomenon and should be considered in the differential diagnosis of splenic infarction once more common diagnoses, such as endocarditis and lymphoma have been excluded.

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