Multiple ‘doughnut’ granulomas in a liver transplant patient with CMV reactivation

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DESCRIPTION
A 50-year-old man with a history of alcoholic cirrhosis and liver failure, postorthotopic liver transplantation 6 months prior, presented with failure to thrive and diffuse body pain for 1 month. Physical examination was unremarkable aside from low-grade fever. There was no adenopathy or rash.

A complete blood count showed leucopenia (white cell count: 1.4×10⁹/L), mild anaemia (haemoglobin: 124 g/L) and thrombocytopenia (platelets: 100×10⁹/L). Liver enzymes were normal. The bone marrow biopsy revealed normocellular marrow with adequate trilineage haematopoiesis and multiple ‘doughnut’ granulomas consisting of a central lipid vacuole surrounded by epithelioid histiocytes and a dense eosinophilic fibrin ring (figure 1A,B).

Gomori methenamine silver and acid-fast bacilli stains were negative. Serologic testing for fungi, HIV, Treponema and Brucella was negative. Quantitative PCR for cytomegalovirus (CMV) was below 500 copies/mL 1 month prior but had increased to 190,000 copies/mL. Patient was diagnosed with CMV infection and treated with intravenous ganciclovir for 14 days, followed by oral valganciclovir. Blood counts normalised 2 months after treatment, at which time CMV PCR was negative.

Learning points
► Fibrin ring or doughnut granulomas are a classical finding of Coxiella infection, but can also be attributed to other disseminated infections including Epstein-Barr virus, cytomegalovirus (CMV), hepatitis A virus, Leishmania donovani and Staphylococcus epidermidis, as well as non-infectious causes including allopurinol hypersensitivity and Hodgkin’s disease.
► CMV infection is the most common viral infection in liver transplant recipients, caused by both a reactivation of CMV during the immunocompromised state and, less commonly, an acquired infection from seropositive organ donors or blood transfusion.
► Fever and pancytopenia are common presentation of CMV reactivation. Patient with severe or tissue-invasive syndromes should receive initial intravenous ganciclovir or fosarnet, which can be switched to oral regimen on clinical improvement. Mild disease in immunosuppressed patients may be treated with oral valganciclovir.

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