CASE OF THE MONTH

Hepatitis and a rash in an immunocompromised patient

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Received 22 December 2009

Revised 6 June 2010

Accepted 21 July 2010

DOI: 10.1259/bjr/20127924

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Case report

A 66-year-old female presented to the accident and emergency department with a rash and dull abdominal pain, predominantly in the right upper quadrant and epigastrium. She had no history of hepatobiliary or gastrointestinal disease. A background of mantle cell lymphoma was noted and at the time of presentation she was in her second remission following completed chemotherapy 4 months earlier. On examination, the rash was vesicular in nature and affected the limbs, trunk and face.

A series of investigations, including plain radiography and blood tests, were performed on admission. Plain chest and abdominal radiographs were unremarkable. The blood test results confirmed a lymphopaenia

$0.3 \times 10^9 \text{ l}^{-1}$ (normal range $1\text{--}4 \times 10^9 \text{ l}^{-1}$) and biochemical features consistent with hepatitis; alanine transaminase (ALT) 1062 IU l^{-1} (normal range $<55 \text{ IU l}^{-1}$), alkaline phosphatase (ALP) 222 IU l^{-1} (normal range $40\text{--}150 \text{ IU l}^{-1}$) and bilirubin 16 umol l^{-1} (normal range $3\text{--}21 \text{ umol l}^{-1}$). Serum amylase was normal at 109 u l^{-1} (normal range $22\text{--}125 \text{ u l}^{-1}$) whilst the C-reactive protein was mildly elevated at 32 mg l^{-1} (normal range $<10 \text{ mg l}^{-1}$). Hepatitis virus antibodies (hepatitis B and C) and antibody markers of autoimmune diseases were all negative. Shortly after admission, the patient's condition deteriorated and a contrast-enhanced CT scan of the abdomen and pelvis was performed (Figure 1 and 2). This enabled a specific diagnosis to be made and appropriate therapy was started. Following clinical recovery, the patient was discharged and a follow-up CT scan was obtained 3 months later. What are the abnormalities on the images and what is the cause?

Figure 1. Axial image from the first contrast-enhanced CT scan (window centre 40 HU, window width 400 HU).

Figure 2. Axial image from first contrast-enhanced at the level of kidneys and pancreatic head CT scan (window centre 40 HU, window width 400 HU).

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Imaging findings and diagnosis

The first CT scan demonstrated numerous small (2–4 mm), ill-defined low-attenuation lesions within both lobes of the liver with no rim enhancement or calcification (Figure 1). The lesions were far more conspicuous when the images were viewed on “liver window” settings. While the pancreas itself enhanced normally, there was peripancreatic and mesenteric fat stranding extending posteriorly to Gerota’s fascia overlying the right kidney. There was also a small volume of free fluid in the hepatorenal space (Figure 2). No other significant abnormalities were present, but, importantly, her liver had appeared normal on a previous surveillance CT study performed 3 months earlier.

Based on the combination of a varicella rash, immunocompromised status, biochemical hepatitis and new liver lesions on the CT images a diagnosis of systemic varicella hepatitis was made. Following 14 days of treatment with iv acyclovir the patient made a good clinical recovery and was discharged.

A few weeks later she was admitted to another hospital with visual symptoms and was diagnosed with, and treated for, varicella retinitis. She was recommended to continue oral aciclovir for an indefinite period. A follow-up CT scan performed 3 months later showed complete resolution of the liver lesions and the peripancreatic inflammation. Liver function tests had slowly normalised beyond the period of admission, such that the ALT was 73 IU l⁻¹ at the time of the second CT study, and 44 IU l⁻¹ another 3 months later.

Discussion

Varicella zoster virus (VZV) usually causes a mild self-limiting illness in children but is potentially lethal in immunocompromised patients. Whilst the most common mode of infection of VZV in immunocompromised hosts is by reactivation of the latent virus, primary infection is also possible in previously unexposed patients. VZV is a member of the herpes virus family, and like other members of this family has a predilection for the liver. In immunocompetent individuals VZV is commonly associated with a mild hepatitis and only rarely with fulminant liver failure. However, VZV infection in immunocompromised hosts is frequently lethal, with rapid dissemination to the lungs and gut, causing pulmonary and small bowel haemorrhage. Visceral VZV manifests as generalised abdominal pain and it is important to note that the associated skin rash may occur synchronously or several weeks later [1].

To the best of our knowledge, there have been only two previous reports on the CT appearances of visceral involvement by VZV. In the report by Ruehm et al [2]

multiple small hypodense nodules with ill-defined margins were described, along with peripancreatic and perirenal fluid. The patient was immunocompromised and died of multi-organ failure soon after the CT. In the other report [3] an immunocompetent patient responded to aciclovir therapy and a follow-up study showed resolution of the liver lesions. Our report, therefore, is only the second imaging description of VZV hepatitis, which responded to appropriate antiviral therapy. As lesions are subtle, a high degree of radiological suspicion and viewing at “liver window” settings (window centre 70 HU, window width 150 HU) is recommended.

A differential diagnosis exists for multiple low-attenuation lesions in the liver. Pyogenic abscesses are well-defined low-attenuation lesions and have an enhancing rim [4]. They sometimes cluster in a focal part of the liver. Small low-attenuation lesions are also observed with fungal infections, additional rim enhancement, periportal fibrosis and involvement of the spleen [5]. Recurrence of lymphoma with hepatic involvement is another possible cause, although low-attenuation lesions are usually larger in lymphoma. Metastases and primary hepatocellular carcinoma (HCC) have a variable appearance, although are usually of lower density than the surrounding liver [6]. HCCs often develop in a cirrhotic liver, with an enhancing pseudocapsule. In our case, the combination of the new varicella rash and biochemical hepatitis in an immunocompromised patient, with non-rim-enhancing multiple small and poorly defined lesions suggested VZV hepatitis as a diagnosis. The patient responded to antiviral therapy and the follow-up CT scan showed complete resolution of the lesions. Radiologists should be aware of this imaging appearance in patients at risk of disseminated VZV because prompt diagnosis and treatment may improve outcomes.

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