CASE REPORT

COMPUTED TOMOGRAPHY AND ULTRASONOGRAPHIC FINDINGS OF HEPATIC INVOLVEMENT RELATED TO EOSINOPHILIA MIMICKING LIVER METASTASES: REPORT OF 2 CASES

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ABSTRACT

The hypereosinophilic syndrome is a severe disease affecting multiple organ systems as the heart, skin, liver, spleen, urinary, gastrointestinal, nervous, and hematopoietic systems. The most important findings are eosinophilic infiltration and peripheral eosinophilic leukocytosis.
Here, we report liver involvement and abdominal computed tomography (CT) and ultrasonography (US) characteristics of the hypereosinophilic syndrome in two patients.

Keywords: Hypereosinophilic syndrome, Liver, Computed tomography

KARACİĞER METASTAZINA BENZEYEN EOSİNOFİLİ İLE İLİŞKİLİ KARACİĞER TUTULUMUNUN BİLGİSAYARLI TOMOGRAFİ VE ULTRASONOGRAFİ BULGULARI

ÖZET

Hipereosinofilik sendrom kalp, deri,karaciğer, dalak, üriner, gastrointestinal, nörolojik, hematopoetik sistemler gibi birçok sistemi etkileyen ciddi bir hastalıktır. En önemli bulgular periferal eosinofilik lökositoz ve eosinofilik infiltrasyondur. Burada, biz iki hastada hipereosinofilik sendromunun karaciğer tutulumunun abdominal ultrasonografi ve bilgisayarlı tomografi bulgularını sunduk.

Anahtar Kelimeler: Hipereosinofilik sendrom, Karaciğer, Bilgisayarlı tomografi

INTRODUCTION

The hypereosinophilic syndrome is a severe disease affecting multiple organ systems caused by eosinophilic infiltration and peripheral eosinophilic leukocytosis. In particular, the heart, skin, liver, spleen, urinary, gastrointestinal, nervous, and hematopoietic systems, are affected. Clinical findings depend on the degree of organ involvement[1]. This syndrome, first described by Hardy and Anderson in 1968, is known as idiopathic eosinophilia[2]. It is characterized by persistent peripheral eosinophilia of 1500 eosinophils/ mm^3 or more for more than 6 months. In addition, other causes of eosinophilia including parasitic infestations, allergic reactions, connective tissue disorders, dermatoses, neoplastic diseases, and organ involvement are absent[3].

There have been reports of ultrasonography (US) and abdominal computed tomography (CT) findings of liver involvement related to eosinophilia[4-6]. Here, we report 2 cases. In the first, we report the helical abdominal CT, US,

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and pathologic findings of hepatic involvement of eosinophilia-related necrosis mimicking hepatic metastases. In the second case, we report the helical CT findings during eosinophilia and during normal eosinophil levels.

CASE REPORTS

Case Report 1

A previously healthy 57-year-old man with dull pain in the right upper quadrant of the abdomen and epigastric discomfort was admitted to the gastroenterology department of our hospital. The patient was evaluated by abdominal US, which showed diffuse, coarse parenchymal echogenicity without any focal mass, and heterogeneous, hypoechoic, ill-defined areas in the left lobe of the liver. The patient had mild liver dysfunction, with slightly elevated alanine aminotransferase and aspartate aminotransferase levels. The peripheral white blood cell (WBC) count was 9430/mm^3, with 46.7% eosinophils (normal range, less than 7% of WBCs). The results of microbiologic and immunologic, alfa feto protein (AFP), prostat spesifik antijen (PSA), and erythrocyte sedimentation rate tests were normal. The patient had no history of allergic diseases, and the results of stool and skin tests for parasites were negative.

The patient underwent triphasic dynamic helical CT scanning (MX8000, Philips, Holland) with a bolus injection of 150 mL nonionic contrast medium via a power injector. Precontrast and arterial phase CT images showed hypodense, nodular areas in the hepatic parenchyma. There were multiple, hypodense nodules with relatively ill-defined margins in the left and right hepatic lobes on the portal venous phase CT images. The lesions appeared clearer during the portal venous phase than during the hepatic arterial phase. In particular, lesions in the left lobe were compositely and bigger than were the lesions in the right lobe. On equilibrium phase images, minimal contrast enhancement was observed around hypodense nodules which had poorly defined margins. Some lesions appeared as patchy subtle hypodense areas rather than as focal nodules. The portal and hepatic veins were normal. The patient had no pathologic lymphadenopathy, and the results of a thoracic CT scan were normal. Because of the CT findings, we believed the lesions to be metastatic lesions. The results of an endoscopy and colonoscopy were normal. After sonographic localization of the lesions, a sonographically guided percutaneous biopsy of the poorly defined hypoechoic areas in the left lobe was performed using an 18-gauge automated biopsy gun.

Microscopically, the biopsy specimen showed foci of hepatocellular necrosis, fibrosis, marked inflammatory cell infiltrates that were composed predominantly of eosinophils and degenerate polymorphonuclear leukocytes in the necrotic areas. Specifically, there was severe infiltration of the periportal area by eosinophils and mononuclear leukocytes. No pathologic microorganisms were observed on histology. No atypical or metastatic cells were seen. The pathologic diagnosis was concordant with necrosis and an inflammatory change that formed an abscess.

Case Report 2

A 51-year-old woman complaining of epigastric discomfort was admitted to the gastroenterology department of our hospital. The patient was evaluated with abdominal US, which showed multiple peripheral isoechoic and hypoechoic solid lesions with a surrounding “halo.” The results of standard laboratory analyses demonstrated 11700 / mm^3 leukocytes with 16.7% eosinophils (normal WBC range, < 7%). The results of microbiologic and immunologic tests, AFP, CEA were normal. The patient’s history was not significant for any allergic diseases, and the results of stool and skin tests for parasites were negative.

The patient underwent a triphasic, dynamic, helical CT scan with a bolus injection of 120 mL nonionic contrast medium. Precontrast and arterial phase CT images showed multiple, oval or wedge-shaped, hypodense nodular lesions of varying sizes in the hepatic parenchyma. Portal venous phase CT images demonstrated segmental and/or subsegmental involvement in both lobes of the liver . Most

of the lesions showed contrast enhancement on equilibrium phase images. The portal and hepatic veins appeared normal. Owing to the CT findings, we believed the lesions to be metastatic lesions. Endoscopy was concordant with gastritis. Abdominal CT images obtained 2.5 months after the start of gastritis, medical therapy showed a decrease in the sizes and the number of lesions. The patient's WBC count was 8640 mm^3 with 5.6% eosinophils. The patient's eosinophilia improved and the number of lesions decreased and so, we believed that these lesions might be related to hypereosinophilia.

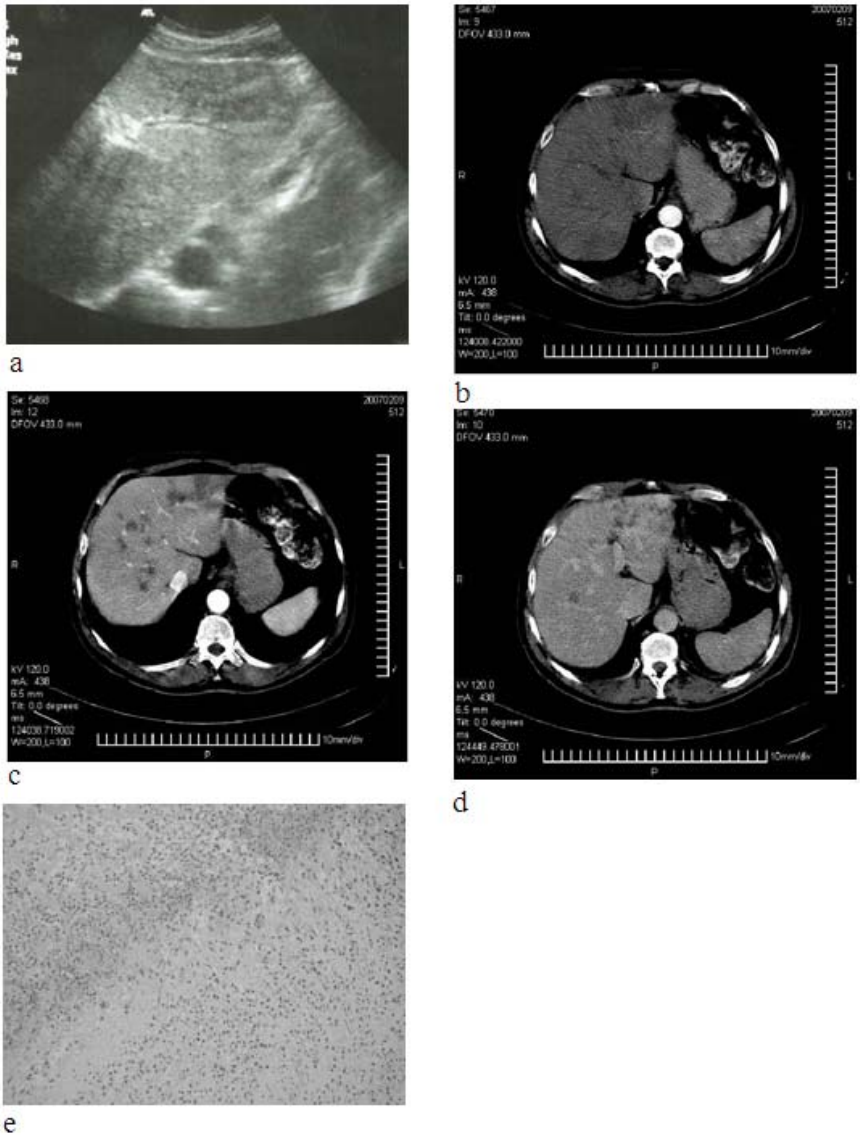
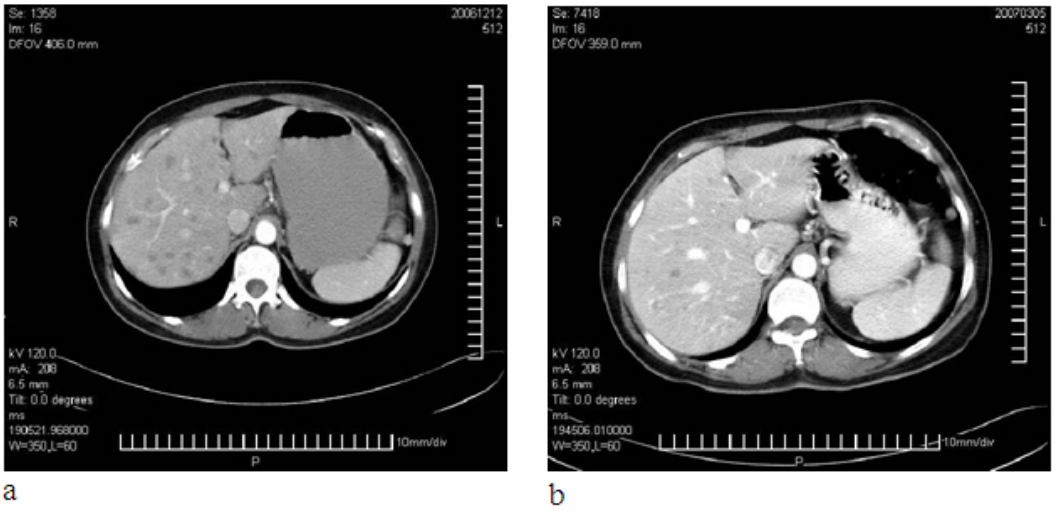


Figure 1: A 57-year-old man with dull pain in the right upper quadrant of the abdomen: a) transverse sonogram of the liver shows hypoechoic, patchy areas in the left lobe, b and c) CT images on arterial and portal phase show multiple hypodense lesions in the left and right lobes of the liver, d) the equilibrium phase image shows contrast enhancement of these lesions, e) a photomicrograph of a needle biopsy specimen shows hepatocellular necrosis and numerous mononuclear inflammatory cell infiltrates predominantly composed of eosinophils (H&E, × 200).



a b

Figure 2: A 51-year-old woman presented with epigastric discomfort: a) CT images in the portal venous phase show multiple, round, oval or wedge-shaped hypodense lesions of both liver lobes, b) control CT images obtained 2.5 months after medical treatment showing a decrease in the number and size of the lesions.

DISCUSSION

Eosinophilia can depend on many diseases, such as neoplastic diseases, parasitic infestations, allergic reactions, and hypereosinophilic syndromes. Some parasitic infestations manifest as focal lesions in the hepatic parenchyma via penetration or hematogenous migration of the parasite to the liver[7]. Lymphoma, leukemia, and carcinoma may be associated with eosinophilia. However, these patients have a primary tumor mass. Eosinophilia may resolve following extraction of the primary mass[8]. Neither a parasitic infestation nor a primary tumor mass was found in our patients.

The hypereosinophilic syndrome is a spectrum of disorders characterized by marked eosinophilic leukocytosis without organ dysfunction and with no known cause. Liver involvement may be present, and hepatomegaly and abnormal results on liver tests are present in 40% to 90% of patients with the disorder[1,2,5]. Men constitute approximately 85% of the patients with the hypereosinophilic syndrome, which occurs primarily in middle age. The most frequent complaints are weight loss, dry cough, and weakness, although symptoms and signs vary. WBC counts generally range from 10 000 to 100.000/mm^3, and peripheral eosinophil percentages are 30%-70% in the majority of patients[1,2,9]. Because our first patient had eosinophilia, minimally abnormal results on his liver function tests, no allergic reactions, and his complaints were nonspecific, we thought that he might have the hypereosinophilic syndrome.

There are reports of pathologic changes from eosinophil-related hepatic damage on CT and US[4-6,10]. The most common pathologic findings are severe infiltration by eosinophils in the periportal area, eosinophilic abscess, and hepatocellular necrosis. The first patient had foci of hepatocellular necrosis, fibrosis, severe infiltration of the periportal area by eosinophils and mononuclear leukocytes, and inflammatory changes to produce an abscess.

In the hypereosinophilic syndrome, findings on US are hepatomegaly, diffuse, coarse parenchymal echogenicity without focal mass; or multiple, hypoechoic, isoechoic, or hyperechoic focal nodular lesions in the liver. The margins of lesions may be ill-defined or well-defined[5,6]. In our first case, there was diffuse hyperechogenicity of the liver without any focal mass on US. The left liver lobe showed hypoechoic patchy areas with poorly defined margins. In the second case, the

lesion margins were well-defined on US. In previous reports, abdominal CT images have demonstrated oval or round, hypodense lesions, particularly in areas adjacent to the portal veins. These lesions were well-defined or ill-defined, with an average diameter of 2 cm (range, 1-4 cm). Most lesions were more visible during the portal venous phase than during the hepatic arterial phase. During the equilibrium phase, some lesions showed contrast enhancement and disappeared[5,6,11]. Similarly, in our first patient, there were multiple hypodense lesions with relatively poorly defined margins during the portal phase. Some of this patient's lesions during the equilibrium phase showed minimal contrast enhancement. Contrast enhancement of lesions during the equilibrium phase was more pronounced in our second patient. According to previous reports, the isodense appearance results from the fact that contrast material diffuses more easily into small, hypodense lesions[6]. As reported earlier, we found that CT, as compared with US, demonstrated a greater number of lesions, of greater sizes, with more clearly defined margins. Kim and associates reported that CT images obtained 2 to 6 months after the start of corticosteroid or antihistamine therapy showed a nearly normal appearance of the liver[5]. The percentage of eosinophils in peripheral blood has been associated with the number of lesions[6]. In the second patient in this report, we did not apply a specific therapy because the patient's eosinophil count was normal and the number of lesions decreased after 2.5 months and we believed that the lesions might have arisen from eosinophilia-related hepatic damage.

If the CT and US findings of eosinophil-related liver necrosis are nonspecific, it may be difficult to differentiate them from metastatic lesions. There have been reports in the literature of some imaging findings that can help differentiate these lesions from metastatic hepatic lesions—specifically, that focal hepatic lesions in the portal or hepatic vein might be indicative of benign parenchymal lesions. However, malignant neoplasms are rarely observed in these vessels without mass effect[6,12] Unfortunately, we were unable to distinguish these lesions from metastastatic lesions.

In summary, if a patient has eosinophilia in the peripheral blood, eosinophil-related liver involvement and liver necrosis should be considered. CT images provide a greater degree of information than does US concerning eosinophil-related liver involvement. Additionally, the number of lesions in the liver is correlated with the amount of eosinophils in the peripheral blood. Therefore, follow-up CT is important in this patient population. To differentiate these lesions from metastatic lesions on CT images, a liver biopsy and a control CT should be performed.

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