Hepatic Toxocariasis: A Rare Cause of Right Upper Abdominal Pain in the Emergency Department

Acil Serviste Sağ Üst Kadran Ağrısının Nadir Bir Nedeni; Hepatik Toksokara

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ABSTRACT

Toxocara canis and *Toxocara cati* are common helminths that reside in the intestinal tract of cats and dogs. Toxocariasis and, commonly, *T. canis*, is a disease commonly seen in children, which is characterised by hypereosinophilia, hepatomegaly, fever, transient pulmonary infiltration, and hypergammaglobulinaemia. Humans, who are not the actual host for these parasitic worms, are infected following oral intake of the infective eggs. Radiological differentiation of hepatic toxocariasis can be difficult, as liver lesions, which present as multiple hypoechoic lesions with regular borders, can look like a tumour, an infarction or an infection. We report on a case that presented to our emergency department (ED) with abdominal pain. During the initial review, the pathology in the liver was thought to be an infarction or an infection; however, the patient was diagnosed with hepatic toxocariasis following further evaluation. *(Turkiye Parazitol Derg 2013; 37: 151-3)*

Key Words: Right upper abdominal pain, *Toxocara canis*, differential diagnosis

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ÖZET

Toxocara canis ve *Toxocara cati*, köpek ve kedigillerin bağırsağına yerleşen en yaygın helmintlerdendir. Toxocariosis; genellikle *T. canis*, enfektif yumurtalarının esas konak olmayan insanlarca ağız yoluyla alınmasıyla ortaya çıkan, özellikle çocuklarda görülen; hipereozinofili, hepatomegali, ateş, geçici pulmoner infiltrasyon ve hipergammaglobulinemi ile karakterize bir hastalıktır. Radyolojik olarak karaciğer lezyonları ilk bakıda tümör, infarkt, enfektif ayrımı zor olabilir. Genelde bu tip lezyonlarda olduğu gibi hepatik toxocarada da radyolojik görüntüleri, multipl, sınırları düzgün, hipoekoik lezyonlar şeklinde görülür. Biz, karın ağrısı nedeniyle acil servisimize başvuran, radyolojik olarak ilk bakıda karaciğer enfarktı ve enfektif kitle ayırımı yapılamayan takiplerinde toksokara tanısı alan hastamızı sunuyoruz.
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Anahtar Sözcükler: Sağ üst kadran ağrısı, *Toxocara canis*, ayırıcı tanı

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INTRODUCTION

Toxocara canis and *Toxocara cati* are among the most common helminths that reside in the intestinal tract of cats and dogs. Humans that live in undersanitised parts of the world are at higher risk of contracting toxocariasis (1). Infection develops following ingesting embryonic eggs contained in soil contaminated with dog faeces (2). *T. canis* has been depicted as multiple small, ill-defined, oval or elongated, low-attenuating nodules on portal venous phase images of dynamic CT. Sonography showed multiple small, focal, hypoechoic lesions in the liver parenchyma. We report on a case that presented to our emergency department (ED) with abdominal pain and who was diagnosed with toxocariasis.

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CASE REPORT

A 41 year-old female patient, complaining of abdominal pain, presented to the ED of Ankara Training and Research Hospital. The patient stated that she had been experiencing abdominal pain for approximately 1 week. The pain was stated to be intermittent in nature, lasting approximately 4 hours each time, but had become worse that day, prompting a visit to the ED. The patient localised the pain in the right upper quadrant and stated that it became worse with inspiration/expiration efforts and that it responded to non-steroidal anti-inflammatory drugs (NSAID). There were no complaints of nausea, vomiting, diarrhoea, constipation or fever. The rest of the patient's history was unremarkable. Physical examination revealed a fully conscious, alert and oriented patient with a Glasgow Coma Scale (GCS) of 15, blood pressure of 110/60 mmHg, pulse of 74 beats/min, respiration of 14/min and temperature of 36.8°C. The patient had tenderness in the right upper quadrant with no rebound or defence. The rest of the physical exam was normal. Biliary colic was initially considered the diagnosis. The results of laboratory tests were as follows: Hgb: 12.4 g/dL (11.7-15.5); WBC: 8300 10^3/µL (5000-1000); eosinophil: 1.1% (0-6%), glucose: 102 mg/dL. AST, ALT, ALP, GGT, amylase and bilirubin levels were all within normal limits. An upper abdominal ultrasonography (USG) was normal. The patient was treated symptomatically and was discharged from the ED. The patient revisited the ED three days later, after the pain had increased in intensity. A further physical examination revealed no new signs except for increased tenderness in the right upper quadrant. An upper abdominal tomography was requested. The result of the IV contrast tomography revealed that the right lobe longitudinal dimension of the liver measured 185 mm, indicating hepatomegaly. There was also a triangular shaped heterogeneous-hypodense region, extending from the subcapsular region to the parenchyma, in the right posterior superior segment (segment VII) of the liver and a minimal subcapsular collection. A nodular hypodense region with a 7 mm radius next to the gallbladder was also noted in the anteroinferior segment of the right lobe of the liver (Figure 1). The patient was admitted to the general surgery department with an initial diagnosis of infarct and/or abscess. Since the eosinophil and WBC values were not high, and as there was no high fever, a liver infarct was thought to be a more likely diagnosis. Further laboratory studies were requested to reveal the underlying aetiology and the following values were obtained: Thyroid function tests: normal; collagen disease tests: VCAgp 125, VCA P 19, Ebna-1, p22 positive, EA-d negative, Beta2 Glycoproteins IgG and IgM (-), C3: 112 mg/dL (79-152), C4 42.6 mg/dL (16-38), anticardiolipin IgG and IgM (-), ANCA IFA (-), ANCA profile ELISA (-), hepatitis tests: HBsAG (-), Anti HBs (+), Anti HCV (-), coagulation tests: fibrinogen: 488 mg/dL (219-403), protein C: 78 (70-130), protein S: 90(60-130), D-dimer: 0.36 mg/mL (0-0.48), malignancy screening tests: sedimentation: 34 mm/hour (0-20), AFP: 8.69 IU/mL (0-5.8), CEA: 1.13 ng/mL (0.0-3.4), CA15-3: 18.37U/mL (0-25), CA19-9: 1.50U/mL (0-39), CA125: 34.78U/mL (0-35), B2 microglobulin: 1508 Ng/mL (609-2366). The result of echocardiographic examination for patent ductus arteriosus was negative. Aortic computed tomography examination revealed no signs of vasculitis; however, a hypodense region of 3 cm x 2.5 cm and 1.2 cm in diameter was noted. An opaque upper abdominal magnetic resonance imaging (MRI) examination revealed subcapsular lesions, 1.5 cm in size, which were possibly related to the abscess, in liver segments 6 and 7. Fine needle aspiration biopsy proved negative for malignancy; however, signs related to non-neoplastic liver parenchyma and minimal inflammation were noted. Parasitological examinations using the Western Blotting method were negative for *Fasciola hepatica*, but results were positive for toxocariasis. The patient was started on a 10-day albendazole (15mg/kg per oral) therapy before being discharged from the hospital. Subsequent 15-day and 30-day follow-ups showed significant improvement in the clinical presentation of the patient and abating of the lesions in the ultrasonographic examinations.

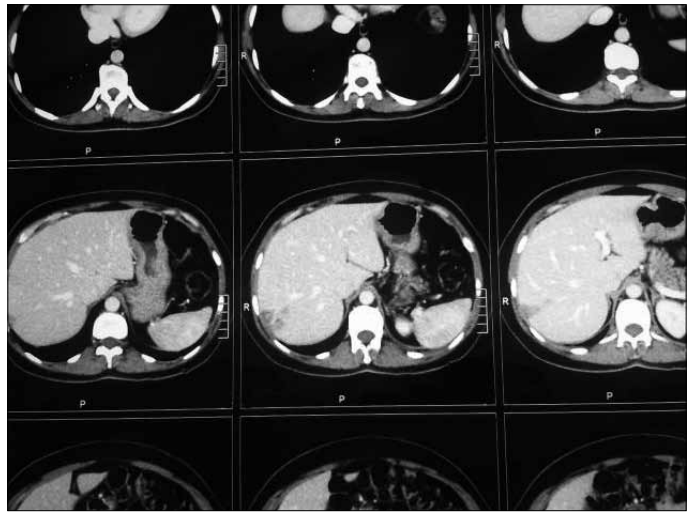

Figure 1. CT imaging of the patient

DISCUSSION

Abdominal pain is one of the most common reasons prompting an ED visit. The causes of abdominal pain can range from a simple intestinal colic to life-threatening aortic dissection. Hepatitis, cholecystitis, biliary colic, cholangitis, pancreatitis, pneumonia, empyema, liver abscess, subdiaphragmatic abscess and liver infarction are among the pathologies that can cause right upper quadrant pain.

Toxocariasis is a helmenthic infection caused by the oral intake of infective cat and dog faeces by humans (especially children). It is characterised by hypereosinophilia, hepatomegaly, fever, transient pulmonary infiltration, and hypergammaglobulinaemia (3). Patients with mild infection usually have no symptoms. Heavy infection can cause fever, nausea, epigastric discomfort, abdominal pain, weight loss, and ocular and neurologic symptoms (4). The most significant clinical presentations in humans are visceral larva migrans (VLM) and ocular toxocariasis developing due to prolonged migration of the *T. canis* larvae (5).

The infective larvae of *T. canis,* which are 0.5 mm long, slowly migrate (larva migrans) within the hepatic parenchyma. Following migration, the larvae cause eosinophilic infiltration followed by abscess or granuloma formation (4). The common histopathological finding of focal eosinophilic infiltration in the liver is periportal

and lobular infiltration of eosinophils with normal histologic architecture. As it is difficult to detect infective larvae in biopsy samples, the disease is diagnosed by serological tests that use excretory/secretory antigens (TES) that are usually excreted by the second-stage larvae of *T. canis*. ELISA and Western-Blotting (WB) are among the commonly used methods to detect anti-*T. canis anticors* (6). We were not able to detect *T. canis* upon biopsy, but were able to diagnose the patient with serological tests.

Azuma reported case of visceral larva migrans presented with chills, eruptions, marked leukocytosis and eosinophiliasis, along with hepatic involvement. Interestingly, in our case, only clinical signs of abdominal pain were present, whereas there was no leukocytosis or eosinophiliasis detected in laboratory findings (7).

Chang et al. (8) studied abdominal ultrasonography and tomography findings of cases with *T. canis*. They found a higher eosinophil count and percentage in the group with hepatic lesions compared to the group without; however, they were not able to determine a relationship between the degree of eosinophiliasis and the amount of hepatic lesions in abdominal ultrasonography and tomography examinations.

Toxocara infections can present in various ways in sonography and tomography. Sonography may show multiple small, focal, hypoechoic lesions in the liver parenchyma. The lesions are usually oval or elongated and are sometimes angulated or trapezoid rather than round, and the margins are ill-defined. These sonographic findings were non-specific and cannot be used to differentiate the lesions from other types of granuloma, inflammatory lesions or infarction. Similarly, *Toxocara* findings in tomography can be nonspecific. However, *T. canis* is typically depicted as multiple small, ill-defined, oval or elongated, low-attenuating nodules on portal venous phase images of dynamic tomography (9). The tomographic view of the liver infarcts are similarly hypodense and well-defined in presence, and thus can be mistaken for infective mass lesions. Lev-Toaff et al. (10) described sharply defined, wedge-shaped low-attenuation lesions extending to the liver surface, and with the suggestion that such infarctions can be differentiated from abscesses, which tend to be rounded.

On magnetic resonance (MR) images, toxocariasis present as single or multiple, small, oval lesions scattered in the liver parenchyma (7). On unenhanced MR images, the lesions are of faint low-signal intensity on T1-weighted images and of faint high-signal intensity on T2-weighted images; the margins are poorly defined.

Percutaneous biopsy of the benign inflammatory lesion under imaging guidance is necessary to differentiate the lesion from hepatic metastasis when a patient has a history of malignancy and the hepatic lesion cannot be differentiated with imaging alone. Rey reported on a patient diagnosed with toxocara using biopsy, after all imaging studies had indicated a liver tumour (11). Following radiological examination, we initially considered liver infarct in our patient, since leukocytosis, eosinophil and sedimentation counts were not high.

CONCLUSION

Fasciola hepatica and *Toxocara canis* are rare causes of right upper quadrant abdominal pain. Some clinical features of liver toxocariasis can mimic tumours and infarct. In patients showing multiple small, oval or elongated, ill-defined, hypoechoic nodular lesions in the liver on computed tomography and/or sonography, *T. canis* should be considered, even in cases without fever and hypereosinophilia.

Conflict of Interest
No conflict of interest was declared by the authors.

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