

Non-Hodgkin's lymphoma presenting as a single liver mass*

Linfoma não-Hodgkin apresentando-se como massa hepática única

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Abstract **OBJECTIVE:** To describe the main imaging findings of non-Hodgkin's lymphoma presenting as a single liver mass. **MATERIALS AND METHODS:** A retrospective study was developed with analysis of cases where a single liver mass was observed at ultrasonography, computed tomography and magnetic resonance imaging, and histologically diagnosed as non-Hodgkin's lymphoma. The studies were reviewed by two observers in consensus. **RESULTS:** Three male patients in the fifth decade of life, with non-specific clinical manifestations and single liver mass diagnosed as non-Hodgkin's lymphoma were identified. A hepatic lesion with target sign was observed at ultrasonography in all of the cases. At computed tomography, all the patients presented a heterogeneous, hypodense mass with a ring enhancement. At magnetic resonance imaging, the lesions were heterogeneous and hypointense on T1-weighted and hyperintense on T2-weighted images. Additionally, a ring enhancement was observed in all of the cases after contrast injection. At the moment of the diagnosis, none of the patients presented lymphadenomegaly or involvement of other solid viscera. **CONCLUSION:** The diagnosis of hepatic lymphoma should be considered in the presence of a ring-enhanced single liver mass. **Keywords:** Lymphoma; Liver; Ultrasonography; Computed tomography; Magnetic resonance imaging.

Resumo **OBJETIVO:** Descrever as principais características de imagem do linfoma não-Hodgkin apresentando-se como massa hepática única. **MATERIAIS E MÉTODOS:** Realizamos estudo retrospectivo mediante análise de casos de pacientes com massa hepática única aos exames de ultrassonografia, tomografia computadorizada e ressonância magnética, com diagnóstico histológico de linfoma não-Hodgkin. Esses exames foram analisados por dois examinadores em consenso. **RESULTADOS:** Identificamos três pacientes, todos do sexo masculino, na quinta década de vida, com quadro clínico inespecífico e que apresentavam massa hepática única e com diagnóstico de linfoma não-Hodgkin. Na ultrassonografia a lesão hepática apresentava-se como massa com aspecto "em alvo" nos três casos estudados. Na tomografia computadorizada observou-se massa hipodensa e heterogênea, com realce anelar em todos os casos. Na ressonância magnética as lesões apresentavam-se heterogêneas, hipointensas em T1 e hiperintensas em T2, e também com realce anelar após a injeção do contraste. Nenhum paciente apresentava linfonodomegalia ou comprometimento de outras vísceras sólidas no momento do diagnóstico. **CONCLUSÃO:** Na presença de massa hepática solitária e com aspecto "em alvo" deve-se considerar, entre as hipóteses, o diagnóstico de linfoma. **Unitermos:** Linfoma; Fígado; Ultrassonografia; Tomografia computadorizada; Imagem por ressonância magnética.

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INTRODUCTION

Primary hepatic lymphomas correspond to 0.4% of extranodal lymphomas and 0.016% of cases of non-Hodgkin's lymphoma (NHL). Although primary hepatic

lymphoma is extremely rare, a secondary involvement is not uncommon. If non-treated, approximately 16% of patients with NHL and 23% of those with Hodgkin's disease present hepatic involvement. The finding of hepatic involvement is more frequent in autopsies, and is reported in up to 51% of cases of NHL and in 50–80% of cases of Hodgkin's lymphoma^(1–4). Most

frequently, it is found in men in their fifth decade of life⁽³⁾. Hepatic NHL can be successfully treated either by means of chemotherapy⁽⁵⁾ or surgery⁽³⁾.

Generally, secondary hepatic lymphomatous involvement is multinodular and diffuse; on the other hand, primary hepatic lymphomas present like a single mass in more than 70% of cases⁽⁶⁾.

Up to the present, about 100 cases of hepatic lymphoma have been described, presenting as a single mass at ultrasonography (US), computed tomography (CT) and magnetic resonance imaging (MRI).

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As a single mass, hepatic lymphomas may simulate other hepatic lesions such as metastases, abscesses⁽⁷⁾ and, exceptionally, other hepatic tumors such as hemangiomas and hepatocarcinomas^(8,9) so the adoption of an appropriate treatment is delayed. Some imaging findings can be useful in the guidance of the diagnosis.

MATERIALS AND METHODS

A retrospective, observational, cross-sectional study was developed by means of archives survey searching for patients with a single liver mass diagnosed and anatomopathologically confirmed as NHL. The survey covered the period between January and December 2006. US, CT and MRI studies were consensually reviewed by two observers for characterizing the mentioned hepatic lesions and describing the main imaging findings.

RESULTS

Three cases of male patients were observed. All of them were in the fifth decade of life, presented non-specific clinical

manifestations and had a single liver mass at imaging studies, histologically diagnosed as non-Hodgkin's lymphoma.

Clinically, the three patients presented low fever, with abdominal pain in the right hypochondrium in two cases, and epigastric pain in one. This later patient was HIV-positive and reported weight loss for three months; and as the disease progressed, an ulcerated duodenal lesion was found and diagnosed as non-Hodgkin lymphoma. Contrarily to the other two patients, in this case the hepatic involvement was considered as secondary.

The hepatic masses measured between 6 and 8 cm in diameter (mean 7 cm). In the three present cases, the lesion presented as a single liver mass with a target sign at US, CT and MRI (Figures 1 to 6), with ring enhancement after contrast agent injection at CT and MRI. In two cases, the lesion was considered as primary of the liver, and in one, as secondary to a duodenal lymphoma. No morphological difference was observed between the primary and secondary presentations. Abdominal lymphadenomegaly was not found at imaging studies in none of the cases described in the present study.

Considering the small number of cases included in the present study, a detailed description of the patients and respective imaging findings will be presented.

Case 1 – Male, 44-year-old, with a clinical picture of fever and mild abdominal pain for two months. At clinical examination, he presented with enlarged and mildly painful abdomen in the right hypochondrium and a palpable liver at 3 cm from the costal margin. US demonstrated a large, hyperechogenic target-lesion, with a thick peripheral halo, and measuring approximately 7.0 cm in diameter (Figure 1). Two days later, CT demonstrated a hypodense, ill-defined lesion in the non-contrast-enhanced phase, and with peripheral enhancement after contrast agent injection (Figure 2). MRI demonstrated a large hypointense mass on T1-weighted images, and hyperintense on T2-weighted images, besides a target enhancement similar to the one found at CT (Figure 3). The anatomopathological study of a fragment of the lesion obtained by means of US-guided biopsy confirmed the presence of a NHL. No other lesion was found, so the hypothesis of a primary hepatic lymphoma was confirmed.

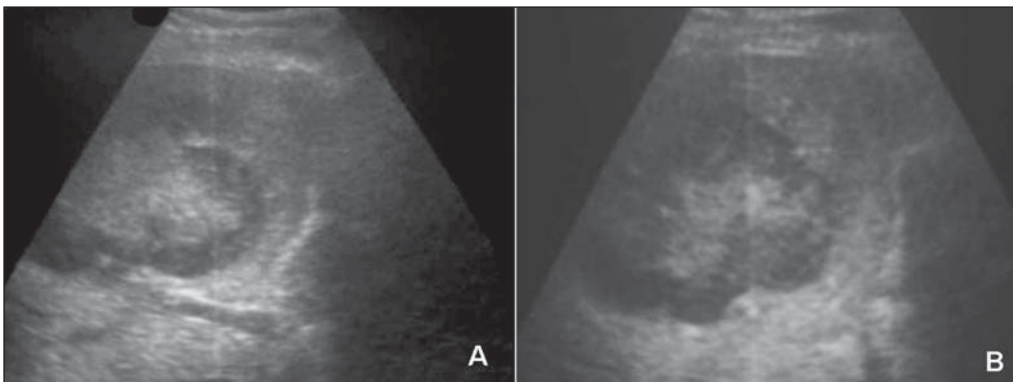


Figure 1. Case 1. US image demonstrating a voluminous, hypoechoic hepatic target lesion with a thick hypoechoic halo, affecting the right hepatic lobe.

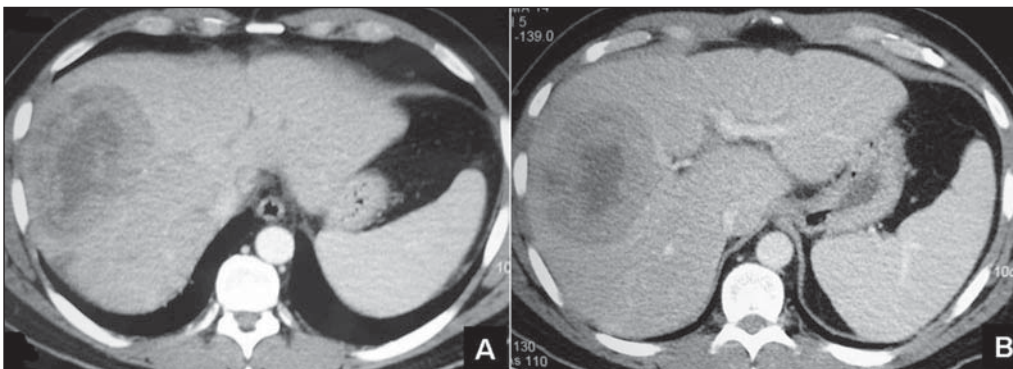


Figure 2. Case 1. Contrast-enhanced CT image showing a lesion with subtle heterogeneous enhancement, decreasing in the central area.

Case 2 – Male, 45-year-old, HIV-positive patient presenting low fever associated with pain in the right hypochondrium, epigastralgia and weight loss for three months. Abdominal US demonstrated a large target-shaped mass measuring approximately 8.0 cm in diameter (Figure 4). At CT, a hypodense mass with peripheral contrast-enhancement in the arterial and portal phases, and progressive enhancement in the equilibrium phase (Figure 5). The patient was submitted to upper digestive endoscopy

that showed a duodenal ulcerated lesion. Biopsy of the duodenal and hepatic lesions was performed, and NHL was diagnosed in both of them. This case was considered as a secondary hepatic involvement.

Case 3 – Male, 40-year-old patient presenting with low fever and pain in the right hypochondrium for about three months. CT demonstrated a hypodense, ill-defined lesion in the precontrast phase, besides peripheral contrast-enhancement (Figure 6). This lesion was initially considered as an

abscess and an unsuccessful drainage attempt was made. CT-guided biopsy demonstrated the presence of a NHL and, in the absence of other lymph node or parenchymal lesions, the primary hepatic involvement was determined. The lesion regressed after chemotherapy.

DISCUSSION

The gastrointestinal tract is the most usual location of primary extranodal lym-

Figure 3. Case 1. MRI image showing hypointense lesion on T1- and hyperintense on T2-weighted sequences, besides target enhancement.

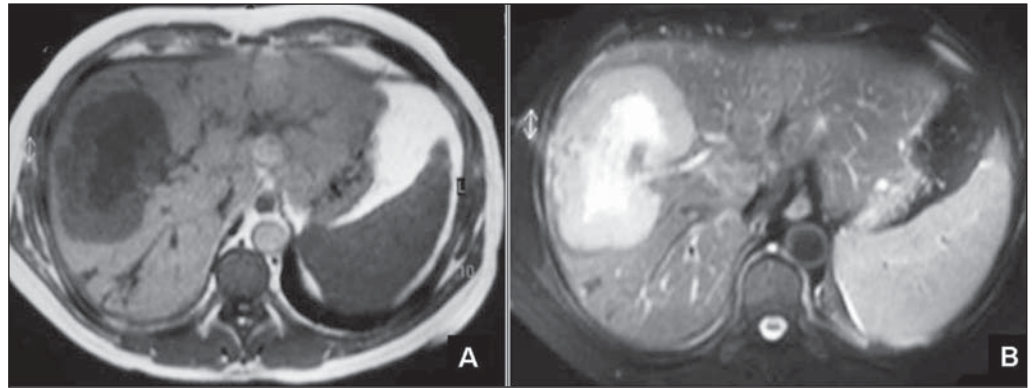


Figure 4. Case 2. US image showing a heterogeneous, well-defined mass in the segment IV of the liver.

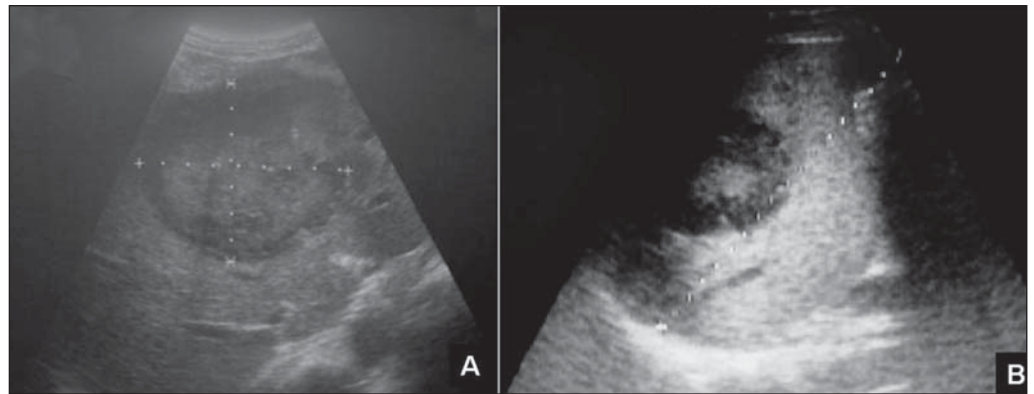


Figure 5. Case 2. CT images in arterial (5a), portal (5b) and equilibrium (5c) phases show a voluminous, hypervascularized mass with a progressive ring-shaped contrast-enhancement.

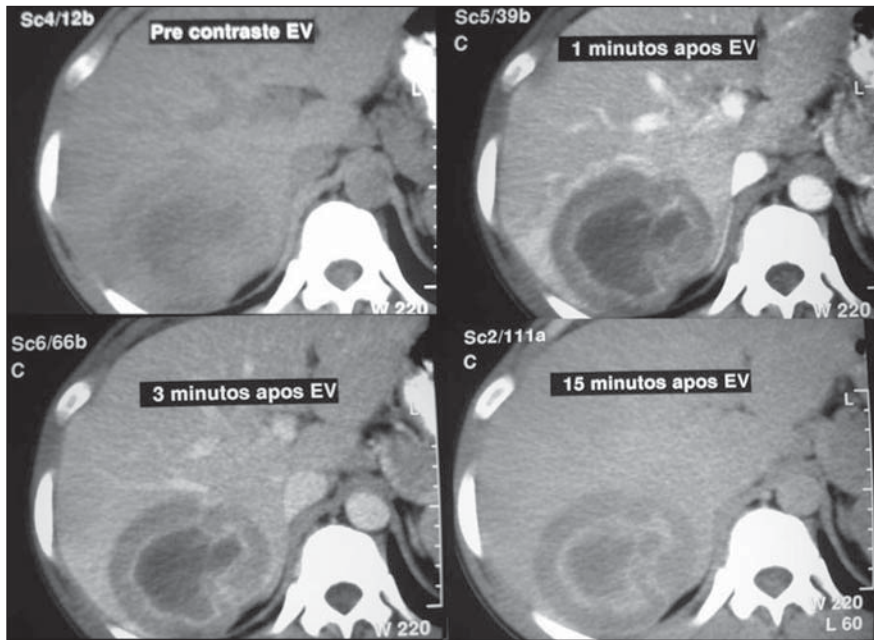


Figure 6. Case 3. Contrast-enhanced CT image demonstrating a mass in the posterior segments of the right hepatic lobe with an enhancement similar to the one observed in the case 2.

phomas, with stomach and small bowel being most frequently affected⁽¹⁰⁾. Primary hepatic lymphomas are extremely rare with less than 100 cases described in the literature (77 cases up to 1999). However, the incidence of this disease has increased as a result of the increasing number of immune-suppressed and organ-transplanted patients⁽³⁾. Generally, the non-Hodgkin's type is most frequently found, and in 70% of cases the lesion presents as a single mass^(6,10,11). Secondary hepatic involvement by a lymphoma is reported in up to 50% of cases, with multinodular and diffuse presentation^(1,6,11).

Main clinical symptoms in patients with hepatic lymphoma are abdominal right upper quadrant (epigastrium) pain, weight loss and fever⁽⁴⁾.

Imaging methods capacity and effectiveness in the staging of lymphomas and consequent usefulness in the therapy planning and follow-up are well established⁽⁴⁾. However, because of their uncommon presentation, lymphomas isolatedly affecting the liver can become a diagnostic dilemma^(6,7).

Homogeneous hepatomegaly and multinodular infiltration represent the most frequent imaging findings in cases of hepatic lymphomas^(1,6,11). Presentation as a

single mass is rare, and some epidemiological and imaging characteristics can be useful in the guidance of the diagnosis.

Similarly to reports in the literature, the three patients included in the present study were in their fifth decade of life⁽³⁾. Only one of the three patients was immune-suppressed, and none presented with signs of chronic hepatopathy. Association of primary hepatic lymphoma with cirrhosis and chronic hepatitis has been described in 30% of cases⁽¹²⁻¹⁵⁾. Although the reason for this association still remains unclear, the diagnosis of NHL should be considered in cirrhotic patients with voluminous hepatic mass and normal alphafetoprotein levels. In cirrhotic patients presenting a hepatic mass, the most probable diagnosis is hepatocarcinoma. Contrary to hepatocarcinoma that frequently presents as a hypervascularized mass⁽⁸⁾, the present cases demonstrated predominantly hypovascular lesions which, although less frequently and usually in association with perilesional fibrotic capsules, may occur in cases of hepatocarcinoma⁽⁸⁾.

In the present cases, US detected a large, heterogeneous, solitary, target-shaped mass with central hypoechogenicity surrounded by a peripheral, thick hypoechogenic halo, which has already been described as a quite common pattern found in

patients with hepatic lymphoma^(1,16). The lesions were voluminous, with diameters ranging between 5.0 cm and 8.0 cm. In the literature, lesions with up to 15.0 cm in diameter are described⁽¹⁷⁾.

In the three cases, CT images presented quite similar findings of a hypodense mass with ring-shaped contrast-enhancement in association with a clinical picture of fever and pain in the right hypochondrium, suggesting the diagnosis of hepatic abscess that has erroneously led the authors to an attempt of drainage. These lesions presented a subtle, progressive contrast-enhancement on more delayed phases, which has been already described in primary hepatic lymphoma⁽¹⁷⁾, but that is also identified in other types of lesions⁽¹⁸⁾.

MRI images of one of the patients with primary hepatic lymphoma, demonstrated a hypointense lesion on T1-weighted sequences, heterogeneous hypersignal on T2-weighted sequences, and peripheral enhancement after paramagnetic contrast agent injection, similarly to the findings reported by other authors in the literature^(2,6,17,19,20) and considered as non-specific by some authors^(6,19).

Among differential diagnoses, hepatocarcinoma, intrahepatic cholangiocarcinoma, metastasis from adenocarcinoma and amebic abscess should be considered. Despite its usefulness, the correlation between clinical data and imaging findings does not rule out the necessity of histological evidence, in most of cases^(3,21). The diagnosis of hepatocarcinoma can be suspected in the presence of a hypervascularized mass and increase in alphafetoprotein levels^(8,22). Intrahepatic and peripheral cholangiocarcinoma constitute an exclusion diagnosis and generally is similar to the present cases. Even biliary tract dilatation is observed in 30% of cases⁽²³⁾. The appearance of amebic abscesses and hypovascularized metastases from hepatocarcinomas may be closely similar to the one described in the present article, and only the correlation between clinical and laboratory data besides percutaneous biopsy can aid in the diagnostic differentiation⁽²⁴⁾.

Finally, the hypothesis of hepatic lymphoma should be considered in the differential diagnosis for immune-suppressed patients with a single ring-shaped hepatic

mass. In the case of male, middle-aged, cirrhotic patients, this diagnosis is extremely relevant, considering its frequency and approach that is different from the one adopted for hepatocarcinomas.

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