

Magnetic resonance imaging and ultrasound in hepatosplenic schistosomiasis mansoni

Ressonância magnética e ultrassonografia na esquistossomose mansoni hepatoesplênica

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ABSTRACT

We report the findings of abdominal ultrasound and magnetic resonance imaging observed in a patient with advanced schistosomiasis mansoni. A 25-year-old man with hepatosplenic schistosomiasis and variceal bleeding confirmed by upper endoscopy was submitted to abdominal ultrasound and magnetic resonance imaging. During surgery for portal hypertension, a liver biopsy was taken and the diagnosis of Symmers' fibrosis was confirmed. Magnetic resonance imaging scans gave more precise information about the gallbladder, periportal thickening and abdominal venous system than did the ultrasound.

Key-words: Hepatosplenic schistosomiasis mansoni. Ultrasound. Magnetic resonance imaging.

RESUMO

Relatamos os achados ultrassonográficos e à ressonância magnética intra-abdominais observados em um paciente com esquistossomose mansoni grave. Um homem de 25 anos de idade com esquistossomose hepatoesplênica e sangramento digestivo de varizes esofágicas, com diagnóstico confirmado pela endoscopia, foi submetido à ultrassonografia abdominal e ressonância magnética. Durante a cirurgia de hipertensão porta, um fragmento de fígado foi obtido e o exame histológico confirmou o diagnóstico de fibrose de Symmers. A ressonância magnética forneceu informações mais precisas sobre a vesícula biliar, espessamento periportal e sistema venoso abdominal do que a ultrassonografia.

Palavras-chaves: Esquistossomose mansoni hepatoesplênica. Ultrassonografia. Ressonância magnética.

Diagnosis of hepatosplenic schistosomiasis and stratification of morbidity permit identification of cases with higher risk of complications such as, variceal bleeding, pulmonary hypertension, and glomerulonephritis, thereby allowing a more rational approach to treatment^{1 15 19 20}. Abdominal ultrasonography (US) is an indirect method of diagnosis of schistosomiasis, and represents a tool in the classification of the clinical forms of the disease^{4 5 16 18}. However, there still is little information about the correlation of US findings and the various aspects of morbidity in schistosomiasis¹⁸.

Magnetic resonance imaging (MRI) has been shown to be a sensitive imaging technique in the evaluation of a variety of diseases. Unlike US, it is not a dynamic examination and can be less vulnerable to intra and inter-examiner variability¹². Some findings of MRI, with different equipment, have been reported previously in three cases of hepatosplenic schistosomiasis mansoni^{8 14 21}, with promising results. We report here in a man with severe hepatosplenic schistosomiasis the evaluation by ultrasonography and magnetic resonance imaging of the abdomen.

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PATIENT AND METHODS

A 25-year-old man was referred to the Hospital of the Federal University of Minas Gerais, in Brazil, for evaluation of anemia which did not respond to medical treatment. He was born and resided in an area endemic for schistosomiasis. Eleven years before admission, stool examination disclosed viable eggs of *Schistosoma mansoni*. He received praziquantel, but maintained frequent contact with stream water. He reported at least 3 episodes of digestive bleeding over the last 8 years, and was submitted to several sessions of endoscopic sclerotherapy of esophageal varices. At clinical examination, he was pale with a palpable liver and an enlarged spleen (Boyd III). Blood counts revealed reduction in all cell series: 3.2×10^6 red cells/mm³, hemoglobin 6.0 g/dL, 1.4×10^3 white cells/mm³, 51×10^3 platelets/mm³. Blood chemistry and coagulation were unremarkable. There was no evidence of renal disease. Digestive endoscopy revealed small size distal esophageal varices and scars

produced by previous sclerotherapy, erosive antral gastritis and hypertensive gastropathy. Serology for hepatitis B and C gave negative results. There was no clinical, electrocardiographic or echocardiographic evidence of pulmonary hypertension. He was operated on (splenectomy and esophagogastric devascularization) and a liver biopsy confirmed the diagnosis of Symmers' fibrosis.

RESULTS

Note in Figure 1 the patient with hepatosplenomegaly, the aspect of a liver with advanced periportal fibrosis and the Ec pattern of WHO for ultrasound in schistosomiasis mansoni (advanced central e peripheral fibrosis + thickening of the gallbladder wall). US of the abdomen with a SIEMENS Sonoline Prima device showed enlarged periportal bands with increased echogenicity suggesting intense periportal fibrosis (Figure 2). Evidence of portal

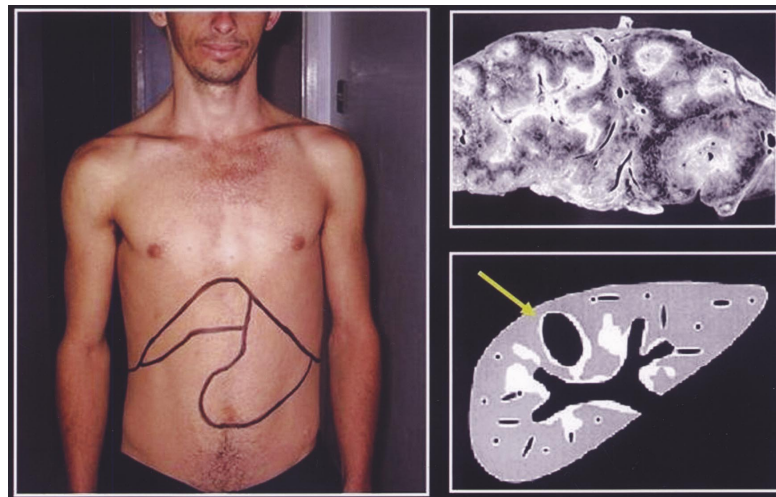


Figure 1 - The patient with hepatosplenomegaly. Note, on the right side, the periportal fibrosis in the liver of a patient who died with hepatosplenic schistosomiasis. Also on the right, below the liver there is a drawing of the Ec pattern of WHO for ultrasonography in schistosomiasis mansoni (advanced central and peripheral fibrosis and thickening of the gallbladder wall – yellow arrow).

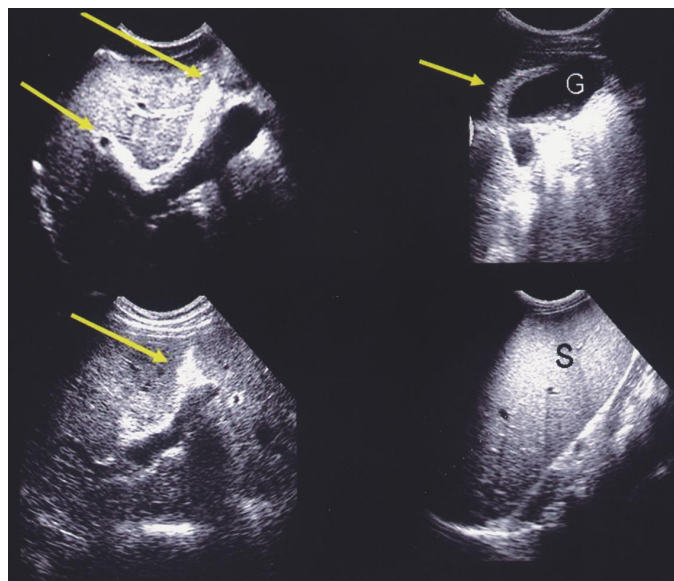


Figure 2 - Ultrasound of the patient showing periportal thickening (yellow arrows on the left side), thickening of the gallbladder wall (G = gallbladder; yellow arrow = thickened wall) and the enlarged spleen (S).

hypertension, with portal vein and spleen enlargement and collateral veins, and thickening of the gallbladder wall were also noticed. MRI of the abdomen was performed using a Gioscan Intera superconducting 1.5 Tesla magnetic system (Philips – Netherlands) (Figures 3, 4 and 5). The sequences demonstrated the broad periportal bands seen on liver ultrasound. On T1

sequences, these bands were hypointense to the liver, while they had increased signal on T2-weighted images. Thickening of the gallbladder wall, enlargement of spleen, splenic and portal veins and collateral vessels were detected. After contrast administration, T1-weighted images revealed enhancement of the gallbladder wall and periportal space (Figure 6).

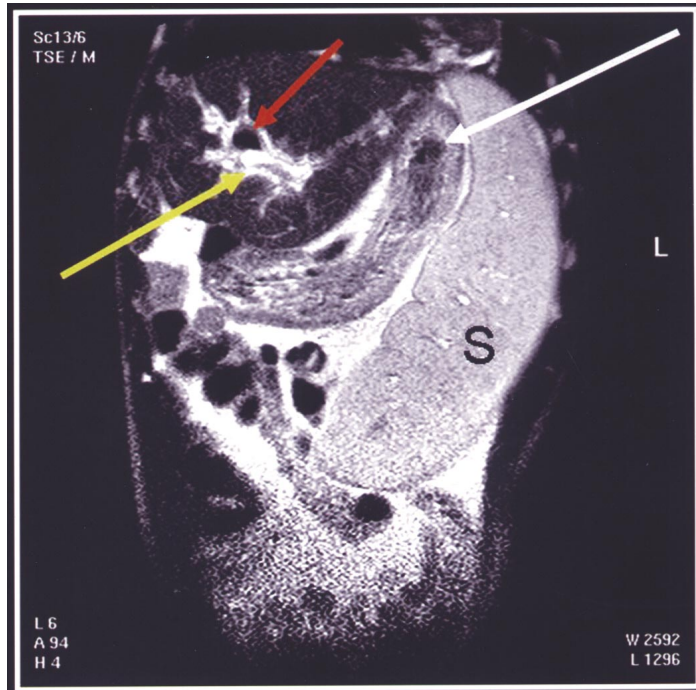


Figure 3 - MRI T2-weighted image of liver and spleen – a coronal section. Liver with periportal thickening (yellow arrow) around the portal vein (red arrow). There is a huge spleen (S). White arrow = stomach.

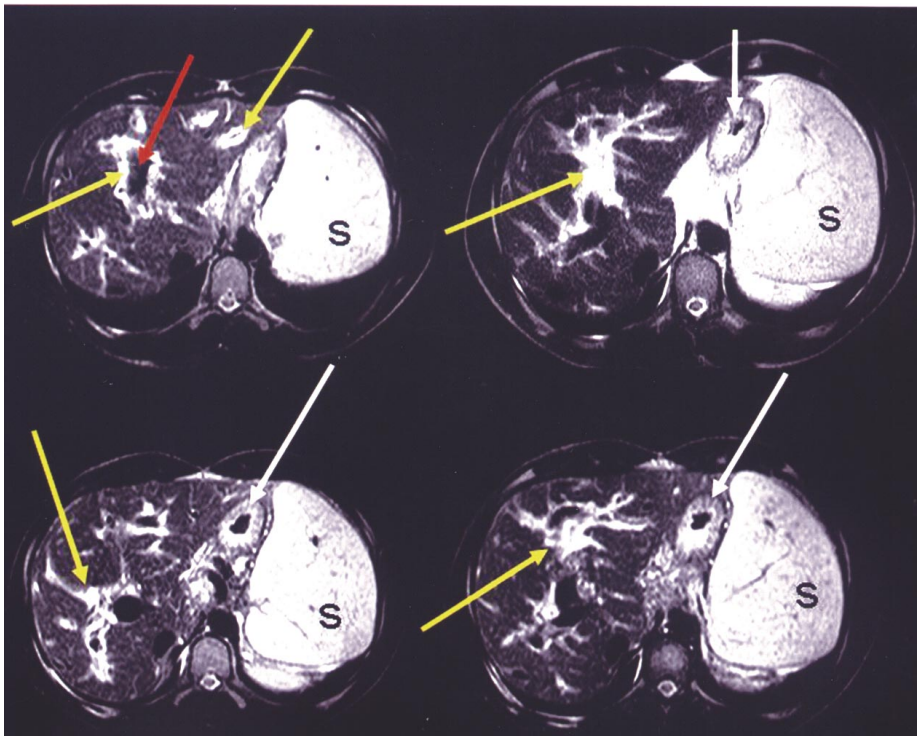


Figure 4 - MRI T2-weighted image of liver and spleen – transversal section. There are four images showing different aspects of periportal fibrosis in the liver (the vein in the center appears dark – red arrow). Periportal thickening (yellow arrows). White arrows = stomach; S = spleen.

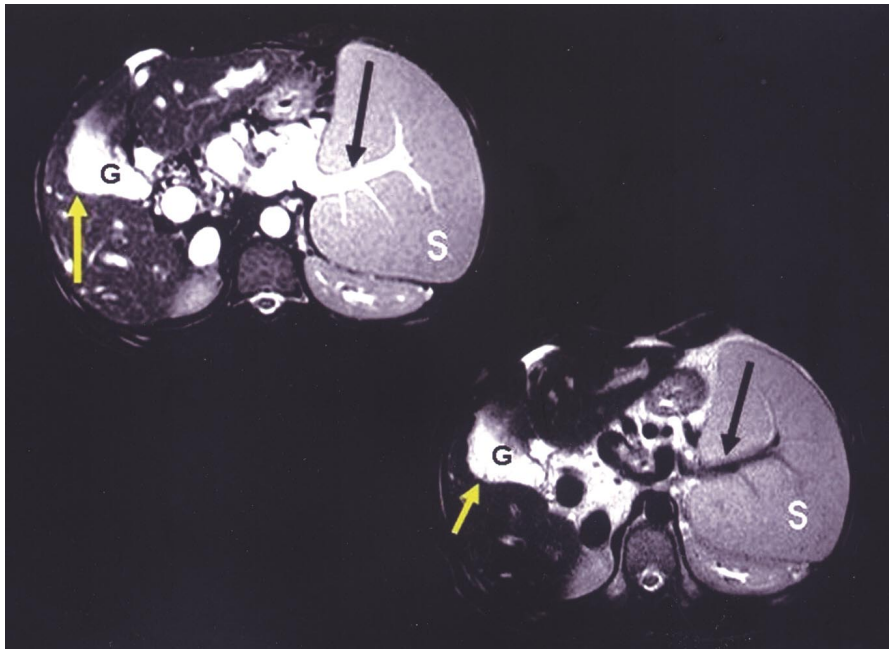


Figure 5 - MRI T2-weighted image of liver and spleen – transversal section. The vessels are easily identified. Black arrow = splenic vein; yellow arrow = thickening around the gallbladder wall. G = gallbladder; S = spleen.

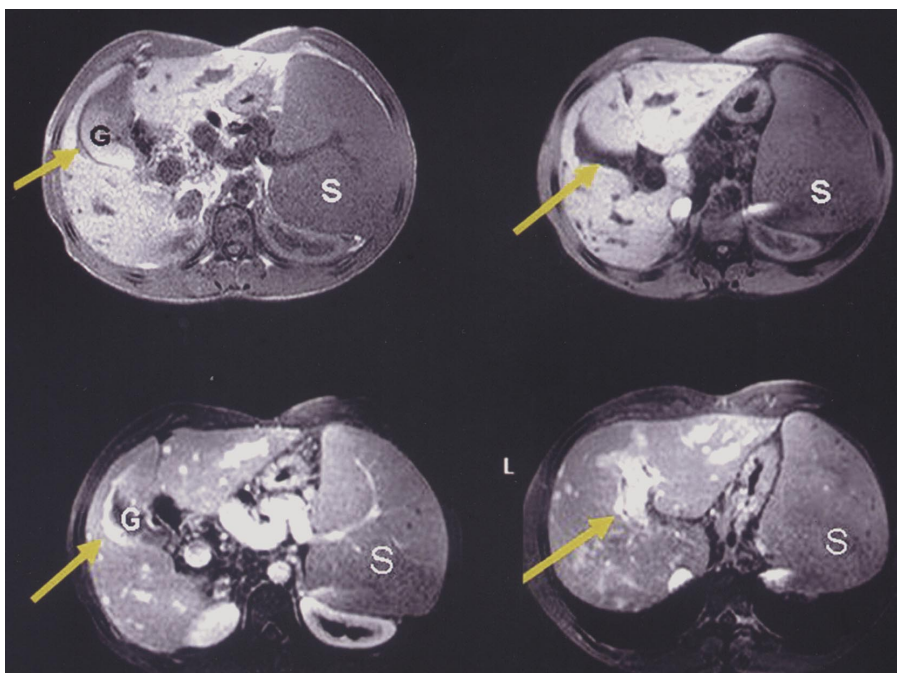


Figure 6 - MRI T1-weighted image of liver and spleen with fat suppression – transversal section. S = spleen; G = gallbladder. The white areas around the vessels (fibrosis) and gallbladder (fibrosis) – yellow arrows – and also the blood inside the vessels, seen in previous images, became black/gray on the two upper figures. Note, in the two lower figures, that there is an enhancement of the gallbladder wall (yellow arrow) and of the periportal thickening (yellow arrow) after the intravenous infusion of contrast (gadolinium).

DISCUSSION

In the patient reported herein, the US and MRI were in accordance. However, MRI scans gave a more objective and familiar view of the intra-abdominal organs. It is easier to pinpoint the alterations caused by the disease in the walls of the gallbladder, the periportal thickening, and to identify the abdominal venous system.

Until very recently the diagnosis of hepatosplenic schistosomiasis was based on the evaluation of hepatosplenomegaly by abdominal palpation⁷. In the last two decades, however, studies comparing spleen palpation to more accurate methods for the diagnosis of spleen enlargement have shown the limitations of abdominal palpation^{3 6 10}. Intense periportal thickening and Symmers' fibrosis have been unveiled in patients without spleen enlargement both on autopsy

and by US examination^{9,17}. In addition, enlarged spleens were revealed by US examination in people with active schistosomiasis, living in endemic areas, concurrently with a normal liver appearance⁹. So, the definition of hepatosplenic schistosomiasis based on the finding of *S. mansoni* eggs in the stools of a person with liver and spleen enlargement is no longer appropriate.

These are examples of how new and more accurate techniques allow a more comprehensive view of schistosomal morbidity^{2 11 19}. MRI has been shown to be a very accurate imaging method in the evaluation of a variety of diseases. The most frequent findings reported in hepatosplenic schistosomiasis using MRI were accentuation of periportal signal in T2-weighted sequences, and hypointense signal in relation to the normal liver parenchyma in T1-weighted sequences with fat suppression. T1-weighted sequences showed accentuation of periportal signal after contrast administration. It has been suggested that the hyperintense signal observed in T2-weighted sequences may differentiate periportal inflammation from fibrosis, what can not be achieved by US examination. It is also of great interest to know whether MRI will be able to recognize patients with less advanced lesions of the liver in schistosomiasis mansoni and help to detect patients in the earlier phases of the disease - a well known limitation of ultrasonography.

The data presented above suggest that MRI findings are characteristic and diagnostic of hepatosplenic schistosomiasis and that it can be a more accurate method for the identification of morbidity, progression of the disease and possibly of involution of fibrosis after treatment. MRI may come to be the gold standard procedure for the evaluation of periportal fibrosis and inflammation in schistosomiasis mansoni. Study of a large series of patients is under way.

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