A female, 67-year old patient weighting 80 kg, with 1.53 m in height, coming from Minas Gerais state, has been referred to the Service of Radiology and Diagnostic Imaging at Hospital Pró-Cardíaco to be submitted to magnetic resonance imaging (MRI) of the heart.

Figure 1. Images acquisition with ECG-gating, in cine-Fiesta sequence (SSFP) at end-diastole, in the following planes: four-chambers (A), middle, basal short-axis (B), map of segmental function (C) aortic flow curve (D).

Figure 2. Images acquired with ECG-gating. Delayed enhancement – middle, basal short-axis (A), two long axis two-chamber perpendicular to each other (B), and map of segmental delayed enhancement (C).
higher incidence in the continent(2,3) . As of the parasitic infectious diseases with Latin America, and is considered as one zoonosis, with high morbidity in the family — is a highly prevalent anthropo-
Kinetoplatida and Trypanosomatidae site of the Mastigophora class, order Trypanosoma cruzi, a protozoan para-
Chagas disease — a condition caused by contracting the infection (4,5) .

and about 100 million people at risk of tries is estimated at 16 to 18 million cases, Chagas disease in Latin American coun-
a matter of fact, overall prevalence of VIII

Figure 1. Images acquisition with ECG-gating, in cine-Fiesta sequence (SSFP), at end-diastole, in the following planes: four-chamber (A), middle, basal short axis (B), map of segmental function (C) and aortic flow curve (D). Observe normalized atria, normal right-ventricular volume with preserved ventricular function. There is a mild dilatation of the left ven-
tricle, with thinning of the medial and basal, infero-lateral walls, a slight global left-ventricle (LV) dysfunction, estimated ejection fraction of 47.1%. Also, akinesia was identified in the medial, infero-lateral segment, hypokinesia in the basal, infero-
lateral and medial antero-lateral segments, with normokinesia in the other segments. Note the typical aspect of apical aneu-
rysm and mild aortic insufficiency.

Figure 2. Images acquired with ECG-
gating. Delayed enhancement, middle basal short-axis (A), two long axis two-
chamber perpendicular to each other (B), and map of segmental delayed enhancement (C). Observe that there was a de-
layed myocardial enhancement (< 50% of segmental area) in the medial antero-lat-
eral and basal infero-lateral segments, and delayed intramural enhancement (> 75% of the segmental area) in the medial, infero-lateral segment.

Diagnostic: Chagasic cardiomyopa-
yth.

COMMENTS

Firstly described by Carlos Chagas in 1909(1), American trypanosomiasis or Chagas disease — a condition caused by the Trypanosoma cruzi, a protozoan para-
site of the Mastigophora class, order Kineto- and Trypanosomatidae family — is a highly prevalent antropo-
zoosmosis, with high morbidity in the Latin America, and is considered as one of the parasitic infectious diseases with higher incidence in the continent(2-3). As a matter of fact, overall prevalence of Chagas disease in Latin American coun-
tries is estimated at 16 to 18 million cases, and about 100 million people at risk of contracting the infection(4,5).

The pathological findings are highly suggestive of the disease. Macroscopi-
cally, chronic chagasic cardiopathy is characterized by a progressive, chronic myocarditis with increase in the myocardial muscle— which may reach more than 1,000 grams —, leading to the four cavi-
ties dilatation, and giving the heart a globoid appearance(6,7). Usually, the myo-
cardium presents softened, with irregular

Figure 3. Apical aneurysm in the chronic chagasic cardiopathy.
Cardiac magnetic resonance imaging contribution in Chagas disease

Cardiac involvement is a determining factor in the Chagas disease prognosis. Therefore, an appropriate evaluation of the heart is essential in the management of the patient. Approximately 30% to 40% of infected peoples will develop cardiac abnormalities during their lives, but only 10% to 20% will present the symptomatic form of the disease.

Histopathological studies indicate the presence of mild chronic myocarditis manifested by the scattered mononuclear cell infiltrate with the surrounding myocytes undergoing several degrees of degeneration and necrosis. The focal and diffuse fibrosis is prominent in the myocardium and conduction system. Myocardial fibrosis has been detected in several anatomopathological studies for Chagas disease where the prevalent sites for fibrosis and left ventricular (LV) microcirculation abnormalities were the LV apex and the basal, infero-lateral segment (Figure 4).

Similarly to data found in the literature, the segmental analysis by MRI and the delayed myocardial enhancement clearly demonstrate in vivo that the LV apical and infero-lateral regions are the most frequent sites for myocardial fibrosis in patients with Chagas disease. This corroborates the concept that in the Chagas disease, myocardial fibrosis is frequently related to regions of terminal circulation like the apex (terminal circulation between the anterior descending coronary artery and descendente posterior) and the basal, infero-lateral segment (terminal circulation between the right coronary artery and the left circumflex artery).

Future prospects

Recent technological developments in cardiac magnetic resonance imaging have been utilized to detect and quantify early signs of cardiac involvement in Chagas disease. These signs may constitute significant prognostic information. This has already been routinely made by means of a detailed evaluation of the cardiac function with the myocardial tagging technique, High-resolution cine-MRI, and delayed enhancement for detection of myocardial fibrosis. Cardiac MRI study in Chagas disease will include acquisitions in a single breath-hold with cine-3D, the techniques of myocardial perfusion, edema and myocardial inflammation detection, and monitoring of intramyocardial stem-cell injections for treatment of the chagasic cardiomyopathy.

Our view is that cardiac MRI may be utilized in the future for selection of patients with very early myocardial involvement by the Chagas disease. With this data, we can develop new therapeutic methods to change the natural history of the Chagas disease.

REFERENCES