

Poster presentation

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Preferential patterns of myocardial iron deposit by multislice multiecho T2* CMR in thalassemia major patients

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Introduction

T2* multislice multiecho cardiac magnetic resonance (CMR) technique has permitted quantification of myocardial iron burden by a segmental approach. Little is known in the literature about patterns of iron store in hemochromatosis.

Purpose

Our study aimed to investigate myocardial iron overload in thalassemia major (TM) patients by segmental T2* CMR technique, in order to determine if there were preferential patterns of iron deposit.

Methods

Five hundred and nineteen TM patients underwent CMR. Three short-axis views (basal, medium, and apical) of the left ventricle were acquired and analyzed using custom-written, previously validated software. The myocardium was automatically segmented into a 16-segment standardized LV model and the T2* value on each segment was calculated, as well as the global T2* value. Four different main circumferential regions (anterior, septal, inferior and lateral) were defined by averaging the corresponding segmental T2* values.

Results

Two-hundred and twenty-nine patients showed global T2* value < 26 ms, corresponding to significant global heart iron overload. The analysis was focused on this patient population, subsequently divided into two groups: severe iron overload (N = 83, global T2* < 10 ms) and mild-moderate iron overload (N = 146, global T2* between 10 and 26 ms). For each group, segments were sorted by mean T2* value. Segment order was significantly preserved between the two groups (r = 0.91, P < 0.0001). Significant circumferential variability was found in patients with overall heart iron overload (figure 1A) as well as in both groups (P < 0.0001). The mean T2* value over the anterior region was significantly lower than the mean T2* values over the other regions and the mean T2* over the inferior region was significantly lower than the T2* values over the septal and lateral regions (figure 1B). This pattern was preserved within each single slice (figure 1C). We found a significantly higher T2* value in the basal slice vs the medium and apical slices in patients with severe iron overload.

Conclusion

A preferential pattern of iron store in anterior and inferior regions appears to be present in TM patients with severe

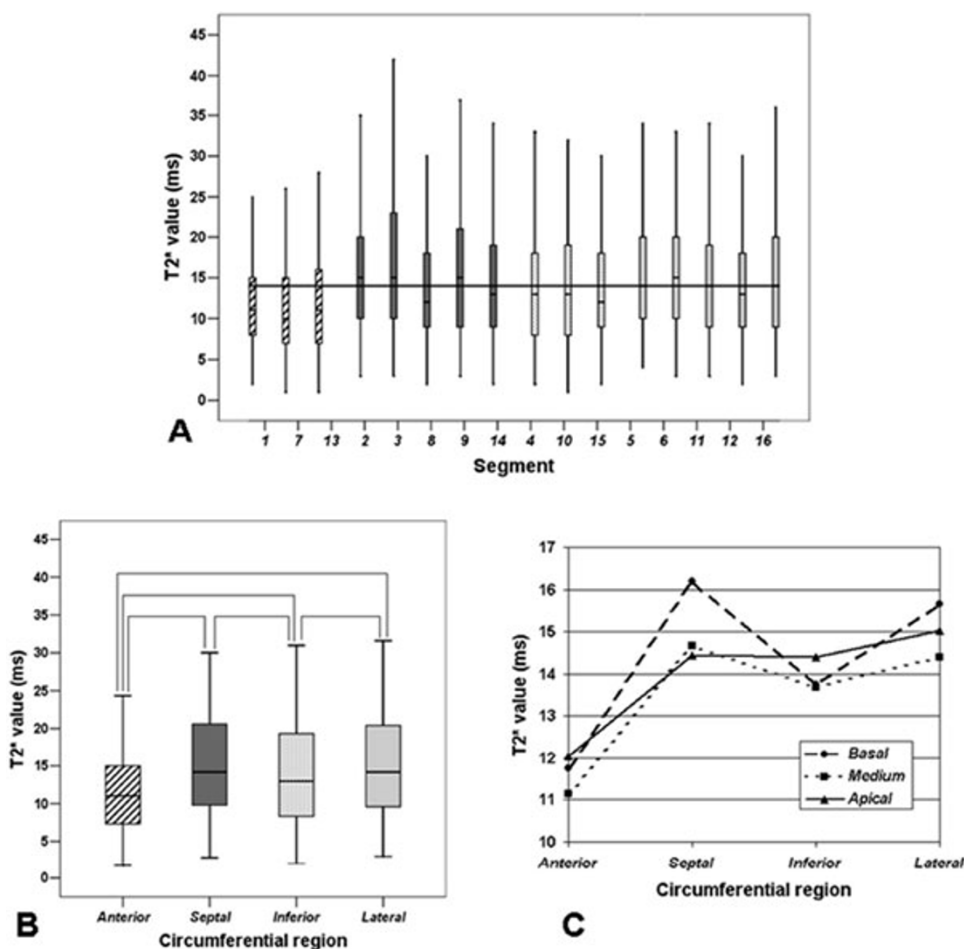


Figure 1
Iron overload patterns: circumferential (A), longitudinal (B), slice-by-slice (C).

and mild-moderate iron overload. The preserved pattern between the groups prevents attributing this datum to additive susceptibility artefacts, which are negligible in heavily iron-loaded patients. A segmental T2* CMR approach could identify early iron deposit, useful for tailoring chelation therapy and preventing myocardial dysfunction in the clinical setting.

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