Assessment of fat content in supraspinatus muscle with proton MR spectroscopy in asymptomatic volunteers and patients with supraspinatus tendon lesions

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PURPOSE
To evaluate proton magnetic resonance (MR) spectroscopy in the assessment of lipid content of the supraspinatus muscle in asymptomatic volunteers and patients with supraspinatus tendon lesions.

MATERIALS AND METHODS
Single-voxel proton MR spectroscopy was used to assess lipid content of the supraspinatus muscle in asymptomatic volunteers (n = 30) and patients with partial-thickness supraspinatus tendon tears (n = 30), newly diagnosed full-thickness supraspinatus tendon tears (n = 30), and chronic full-thickness supraspinatus tendon tears (n = 30). The apparent lipid content of the supraspinatus muscle measured with proton MR spectroscopy was related to its appearance on sagittal-oblique T1-weighted spin-echo MR images (grades 0-4). One-way analysis of variance was performed to test for significant differences, and the Tukey honestly significant difference procedure was performed for post hoc comparisons.

RESULTS
Mean apparent lipid content was 13.7% (95% confidence interval [CI]: 11.5%, 15.8%) for asymptomatic volunteers, 29.5% (95% CI: 25.1%, 34.0%) for patients with partial-thickness supraspinatus tendon tears, 48.6% (95% CI: 41.3%, 55.9%) for patients with full-thickness tears, and 66.1% (95% CI: 57.7%, 74.5%) for patients with chronic tears. Values were significantly different (analysis of variance, P <.001; P <.001-.002 for all post hoc pairwise comparisons). Mean apparent lipid content for the supraspinatus muscle was as follows: grade 0, 19.6% (95% CI: 16.7%, 22.6%); grade 1, 36.8% (95% CI: 33.2%, 40.4%); grade 2, 53.6% (95% CI: 43.1%, 64.2%); grade 3, 67.5% (95% CI: 52.6%, 82.3%); and grade 4, 79.2% (95% CI: 73.2%, 85.3%). With analysis of variance (P < .001), all post hoc pairwise comparisons were significant (P </=.001) except between grades 2 and 3 (P = .112) and between grades 3 and 4 (P = .261). In 14 (25%) subjects who had grade 0 appearance on T1-weighted images, lipid content values were greater than the upper range of
values in the volunteers.

CONCLUSION
Proton MR spectroscopy is suitable in the assessment of apparent lipid content of rotator cuff muscles.

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