MR Imaging of the Orbit in Graves Disease: Comparison of Findings with Normative MR Measurements

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Purpose
To determine quantitatively the changes in Graves disease of some intraorbital structures in comparison to the recently reported normative MR measurements (1) and to assess the value of several MR pulse sequences in diagnosing this disease.

Materials & Methods
MR images of the orbits were evaluated prospectively in 47 patients (26 females, 21 males) with Graves disease (20–66 years; mean, 40). None of the patients had radiotherapy or surgery to their orbitas prior to MR imaging. Thicknesses of the extraocular muscles and diameter of the superior ophthalmic vein were measured in coronal and transverse MR images. Exophthalmos was evaluated using transverse MR images. In patients with suspected fatty infiltration of extraocular muscles in MR, CT examination in transverse and coronal planes verified this finding.

Results
In 29 patients (61.7%) at least one extraocular muscle was thickened, with bilateral involvement in 17 cases (36.2%). Seven patients (15%) displayed enlargement of the superior ophthalmic vein, bilateral in 3 (6.4%). Exophthalmos was present in 23 patients (48.9%), bilateral in 19 (40.4%). Of all the patients with exophthalmos 18 (78.3%) had thickening of one or more of the extraocular muscles. When the parameters of thickening of extraocular muscles, enlargement of the superior ophthalmic vein and exophthalmos were combined, 34 patients (72.3%) had one or more MR imaging findings suggestive of ophthalmopathy. Intensity changes were seen in extraocular muscles in 23 patients (49%). Of these patients 20 (87%) had thickening of extraocular muscle(s) and/or enlargement of the superior ophthalmic vein and/or exophthalmos. Three patients (13%) only displayed intensity changes suggestive of ophthalmopathy. Intensity changes were suggestive of edema-inflammation in 9, fatty infiltration in 13 cases and both in 1 patient.

Conclusion
MR imaging aptly demonstrates extraocular muscle thickening, enlargement of the superior ophthalmic vein, and exophthalmos in Graves disease. Fatty infiltration of the extraocular muscles also has been demonstrated with MR imaging and verified with CT. STIR is the most valuable MR pulse sequence in the investigation of orbit in Graves disease; it was essential in showing fatty infiltration as well as edema-inflammation in extraocular muscles.

References