High-Resolution 3D T2-Weighted Fast Spin Echo Imaging of Ophthalmologic Tumors

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Purpose
Many ophthalmologic tumors require cross-sectional imaging for diagnosis, treatment planning, and posttreatment follow-up. We hypothesized that a high-resolution, ultra-thin-section three-dimensional fast spin echo T2-weighted (3D FSEz T2) MR imaging sequence would provide important anatomical information for the ocular oncologist, have an impact on MR diagnosis, and potentially on patient management.

Materials & Methods
Retrospective review of MR imaging of the orbit, with both routine orbital protocol and 3D FSEz T2 sequences, in 26 patients (27 examinations) with suspected ophthalmologic mass (retinoblastoma (RB) 21, meningioma, retinal metastases, ciliary body melanoma, lymphoma, and probable venolymphatic malformation, 1 each). Findings on 3D FSEz T2 were compared with those of conventional imaging, and the imaging findings correlated with results of ophthalmologic examination under anesthesia, orbital ultrasound, ultrasound biomicroscopy, and pathologic data, as available. The ocular oncologist also retrospectively determined if the information from the 3D FSEz T2 had an impact on patient management.

Results
The 3D FSEz T2 resulted in a change from the conventional imaging diagnosis in 11 (41%) of our 27 imaging studies. The neuroradiologists felt that the 3D FSEz T2 significantly increased their diagnostic confidence in 7 (44%) of the remaining 16 cases, and did not change the interpretation in nine cases. One hundred percent of globes with untreated RB lesions were diagnosed correctly with both conventional and 3D FSEz T2 techniques, but previously treated RB plaques only could be detected reliably with 3D FSEz T2. The additional information from the 3D FSEz T2 sequence changed management in 3 of the 5 patients with lesions other than RB.

Conclusion
3D FSEz T2 is a valuable adjunctive imaging sequence for ophthalmologic tumors. While it cannot replace contrast-enhanced imaging, the higher resolution allows for improved detection of ophthalmologic tumors, particularly in the follow-up evaluation of treated RB. The high percentage of management changes in the non-RB malignancy group underscores the importance of this new technology.

References

A new form of image processing discussed in this presentation was developed by engineers at General Electric Medical Systems.