Teaching NeurolImage: Ganglion Cell Patterns Localize Anterior Visual Pathway Lesions

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Figure 1 Visual Fields, MRI, and Optical Coherence Tomography for 3 Cases of Optic Chiasm Compression

Anterior chiasmal compression by pituitary adenoma (red arrows) on T2-weighted axial MRI (D) corresponds to diffuse visual field loss (dark areas) of the ipsilateral eye with junctional scotoma of the contralateral eye superotemporally (A) and diffuse ganglion cell thinning (blue areas) in the ipsilateral eye and inferonasal thinning in the contralateral eye on optical coherence tomography (D). Central compression corresponds to bitemporal hemianopia (B) and binasal ganglion cell thinning (E). Posterior compression corresponds to (an incongruous) contralateral homonymous hemianopia (C) and temporal ganglion cell thinning in the ipsilateral eye and nasal thinning in the contralateral eye (F).

Measurement of retinal ganglion cell layer thickness by optical coherence tomography provides an objective and reliable evaluation of anterior visual pathway lesions to complement visual field testing in the management of optic chiasm compression from pituitary tumors.^{1,2} We demonstrated 3 differing patterns of ganglion cell layer thinning—junctional (figure 1, A and D), binasal (figure 1, B and E), and homonymous (figure 1, C and F)—and illustrated how these patterns correspond to the location of chiasmal compression by pituitary adenomas, anteriorly (figure 2A), centrally (figure 2B), or posteriorly (figure 2C). Consideration of the pattern of ganglion cell layer thinning in conjunction with visual field testing is useful for predicting the location of anterior visual pathway lesions.

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Figure 2 Schematic of 3 Cases of Optic Chiasm Compression

(A) Optic chiasm (gray) compression anteriorly by pituitary adenoma (pink) affecting the right optic nerve and inferomedial left optic nerve (black arrows). (B) Central optic chiasm compression by pituitary adenoma affecting the central chiasm. (C) Posterior optic chiasm compression by pituitary adenoma affecting the left optic tract.

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Appendix Authors

Name	Location	Contribution
Gregg D. Miller, BA	Tufts University School of Medicine, Boston	Prepared the manuscript, figures, and PowerPoint

Appendix (continued)

Name	Location	Contribution
Laurel N. Vuong, MD	New England Eye Center, Boston	Conceptualized and revised the manuscript, treating physician
Thomas R. Hedges III, MD	New England Eye Center, Boston	Conceptualized and revised the manuscript, treating physician

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