Teaching NeuroImages: Ganglion Cell Patterns Localize Anterior Visual Pathway Lesions

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Measurement of retinal ganglion cell layer thickness by optical coherence tomography (OCT) 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.\textsuperscript{1,2} We demonstrate three differing patterns of ganglion cell layer thinning—junctional (Fig. 1A and D), binasal (Fig. 1B and E), and homonymous (Fig 1C and F)—and illustrate how these patterns correspond to the location of chiasmal compression by pituitary adenomas, either anteriorly (Fig. 2A), centrally (Fig.2B), or posteriorly (Fig. 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.
Appendix 1: Authors

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<tr>
<th>Name</th>
<th>Location</th>
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<tbody>
<tr>
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References

Figure 1: Visual Fields, MRI, and OCT for Three 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 OCT (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).
Figure 2: Schematic of Three Cases of Optic Chiasm Compression. Optic chiasm (gray) compression anteriorly by pituitary adenoma (pink) affecting the right optic nerve and inferomedial left optic nerve (black arrows) (A). Central optic chiasm compression by pituitary adenoma affecting the central chiasm (B). Posterior optic chiasm compression by pituitary adenoma affecting the left optic tract (C).
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