## Where Is the Lesion in Posterior Ischemic Optic Neuropathy Occurring After Prone Spine Surgery?

## To the Editor:

eis et al<sup>1</sup> recently presented a case of postoperative visual loss, which they attributed to posterior ischemic optic neuropathy (PION). In support of that diagnosis, they included a magnetic resonance image. They reported that that image (sequence not specified), an axial section that included the optic nerve and the eye, revealed pathologic changes in the midportion of the optic nerve. My radiologist coauthor and I were unable to identify changes in that image. Geis graciously provided us with a version of that image with greater resolution, but we were still unable to identify pathologic changes. We now write to ask that Geis et al provide the Editor and subsequently the readership with images that demonstrate the location of the pathology. We suggest that the sequences most likely to demonstrate ischemic changes will include postcontrast T1 with fat saturation, T2 with fat saturation, and short tau inversion recovery. Three-millimeter axial diffusion-weighted images parallel to the optic nerves would also be revealing.

Why are we interested? Remarkably, to our knowledge, there has been no documentation as to the precise location of the PION lesion that occurs after spine surgery performed in the prone position. The location of the lesion might cast some light on the etiology. It has been surmised that gravity-related traction on the optic nerve might be contributory—a notion about which we are very skeptical. It has also been suggested that the midportion of the optic nerve, where the blood supply is derived entirely from arterioles penetrating from the enveloping pia, is the least well-collateralized segment of the optic nerve<sup>2</sup> and might therefore be the most vulnerable in the event of a reduction of perfusion pressure. In this latter instance, one would expect the center of the cross-sectional area of the midportion of the optic nerve to be most severely affected, hence our interest in Dr. Geis' images. Pathologic examination of patients who have experienced PION in other situations (gastrointestinal bleeding<sup>3</sup> and radical neck dissection<sup>4</sup>) have been presented, and in both instances, the centripetal distribution of injury just mentioned was observed. If the images from the patient of Geis et al reveal that same distribution, it will add support to the notion that reduction of perfusion pressure (whether from reduced arterial pressure, increased venous pressure, or increased intraorbital pressure) contributes to the occurrence of PION.

## John C. Drummond, MD, FRCPC Roland R. Lee, MD, FACR

Department of Anesthesiology and Department of Radiology The University of California San Diego San Diego, California Anesthesia Service and Radiology Service VA San Diego Health System San Diego, California jdrummond@ucsd.edu

## REFERENCES

- 1. Geis AB, Höfert A, Silvanus MT, Bornfeld N, Peters J. Bilateral blindness due to ischemic optic nerve neuropathy after abdominal surgery. A A Case Rep 2015;5:57–60
- Baig MN, Lubow M, Immesoete P, Bergese SD, Hamdy EA, Mendel E. Vision loss after spine surgery: review of the literature and recommendations. Neurosurg Focus 2007;23:E15
- Johnson MW, Kincaid MC, Trobe JD. Bilateral retrobulbar optic nerve infarctions after blood loss and hypotension. A clinicopathologic case study. Ophthalmology 1987;94:1577–84
- 4. Nawa Y, Jaques JD, Miller NR, Palermo RA, Green WR. Bilateral posterior optic neuropathy after bilateral radical neck dissection and hypotension. Graefes Arch Clin Exp Ophthalmol 1992;230:301–8

DOI: 10.1213/XAA.000000000000333