Teaching NeuroImages: Abducens Nerve Palsy With Ipsilateral Excessive Eye Tearing Attributed to an Internal Carotid Artery Sympathetic Plexus Schwannoma

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Neurology® Published Ahead of Print articles have been peer reviewed and accepted for publication. This manuscript will be published in its final form after copyediting, page composition, and review of proofs. Errors that could affect the content may be corrected during these processes.
Full Title: Abducens nerve palsy with ipsilateral excessive eye tearing attributed to an internal carotid artery sympathetic plexus schwannoma.

Running Title: Abducens palsy due to an ICA sympathetic plexus schwannoma.

Title Character Count: 131

Word Count of Text: 101

Number of References: 2

Number of Tables: 0

Number of Figures: 2

Number of Color Figures: 2

Word count of figure legend: 127 (Figure 1); 147 (Figure 2)

Supplementary Data: https://doi.org/10.5061/dryad.pzmsbck6

Key words: Internal carotid sympathetic plexus schwannoma; Tearing; Vidian nerve; Abducens palsy; MRI.

Disclosure

Dr. Palaiodimou - reports no disclosures.
Dr. Lachanis – reports no disclosures.
Dr. Bakola – reports no disclosures.
Dr. Zis – reports no disclosures.
Dr. Kararizou – reports no disclosures.
Dr. Papadopoulou – reports no disclosures.
Dr. Tsivgoulis - reports no disclosures.

Acknowledgments: None

Study Funding: None
A 65-year-old man developed subacute horizontal diplopia due to left-abducens nerve (AN) palsy and excessive left-eye tearing. Brain-MRI revealed a hyperintense T2-lesion with an elongated course within the left-carotid canal, presenting homogenous contrast-enhancement (Figure-1). The imaging findings were characteristic for an internal-carotid-artery sympathetic plexus (ICSP) schwannoma compressing the left-AN. Subsequent irritation of the deep petrosal nerve originating directly from ICSP and continuing as the vidian nerve may have led to the lacrimal gland edema and excessive left-eye tearing (Figure-2). The thorough case presentation and a cartoon-figure demonstrating the relevant anatomy are available from Dryad: https://doi.org/10.5061/dryad.pzgmsbck6.

ICSP schwannoma represents an uncommon cause of AN palsy\textsuperscript{1,2} that may also manifest with excessive ipsilateral-eye tearing due to vidian nerve involvement.
### Appendix 1. Authors

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References

Figure 1

Title
Neuroimaging findings of a patient with an internal carotid sympathetic plexus schwannoma.

Figure legend
Axial brain MRI with T2-weighted sequence showing a hyperintense lesion along the anterior wall of the left internal carotid artery at the transition of the petrous to cavernous segment (Panel A, arrow). Coronal (Panel B) and sagittal (Panel C) brain MRI with T2-weighted 3D turbo spin-echo (SPACE) sequence with multi-planar reconstruction demonstrating the elongated course of the lesion (arrows) within the left carotid canal, juxta-positionally to the internal carotid artery from the lower part of the cavernous segment until the mid part of the petrous segment. Axial (Panel D), coronal (Panel E) and sagittal (Panel F) brain MRI with T1-weighted 3D SPACE black blood sequence showing the homogeneously enhancing lesion (arrows) in the left carotid canal, surrounding the petrous and cavernous segments of the internal carotid artery.
**Figure 2**

**Title**

Neuroimaging findings of a patient with excessive tearing attributed to an internal carotid sympathetic plexus schwannoma.

**Figure legend**

Axial brain MRI with T2-weighted 3D turbo spin-echo (SPACE) sequence with multi-planar reconstruction showing the vidian nerve (Panel A, arrowheads) within the pterygoid canal in close proximity to the internal carotid sympathetic plexus schwannoma (Panel A, arrow).

Axial (Panel B) and sagittal (Panel C) brain MRI with T1-weighted 3D SPACE black blood sequence demonstrating the left vidian canal as an enhancing linear structure (arrowheads) at the level of the petrous segment of the internal carotid artery. Coronal brain MRI with T2-weighted sequence with fat saturation showing an edematous, enlarged left lacrimal gland (Panel D, arrow) compared to the healthy side and fluid accumulation in the left excretory lacrimal ducts (Panel D, arrowhead). Coronal (Panel E) and axial (Panel F) brain MRI with T1-weighted 3D SPACE black blood sequence confirming the enlargement of the left lacrimal gland with more intense contrast enhancement (arrowheads) compared to the healthy side.
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Neurology published online May 12, 2021
DOI 10.1212/WNL.0000000000012183

This information is current as of May 12, 2021