

Teaching NeuroImage: Rapid Identification of Infectious Optic Neuritis by Next-Generation Sequencing

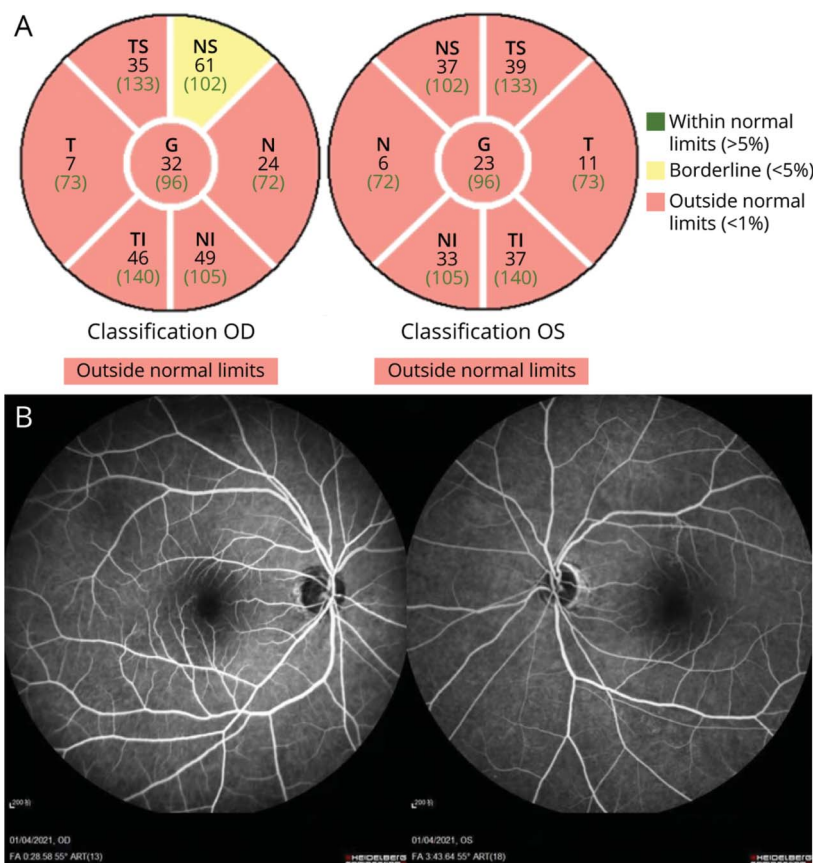
Ying Huang, MD, Yulu Liu, MD, Yongguang Liu, MD, Qiang Li, MD, PhD, Xuejun Fu, MD, Liangyu Zou, MD, PhD, and Qianhui Xu, MD

Neurology® 2022;98:e872-e874. doi:10.1212/WNL.0000000000013213

Correspondence

Dr. Xu
qianhuixu.jnu.edu@
hotmail.com

Figure 1 Ocular Images



Optical coherence tomography of the retinal nerve fiber layer (RNFL) revealed bilateral thinning (A). Fundus angiography was unremarkable (B).

A 52-year-old, HIV-negative woman presented with one year of bilateral painless central vision loss that worsened over 3 months. A medical examination revealed Argyll Robertson pupil (i.e., accommodates but does not react to light). Single-read next-generation sequencing (NGS) of the CSF identified 89 sequence reads corresponding to *Treponema*, elevated CSF protein, pleocytosis, negative aquaporin-4, antimyelin oligodendrocyte glycoprotein antibody levels, retinal nerve fiber layer thinning, and bilateral nerve sheath

MORE ONLINE

Teaching slides

links.lww.com/WNL/B705

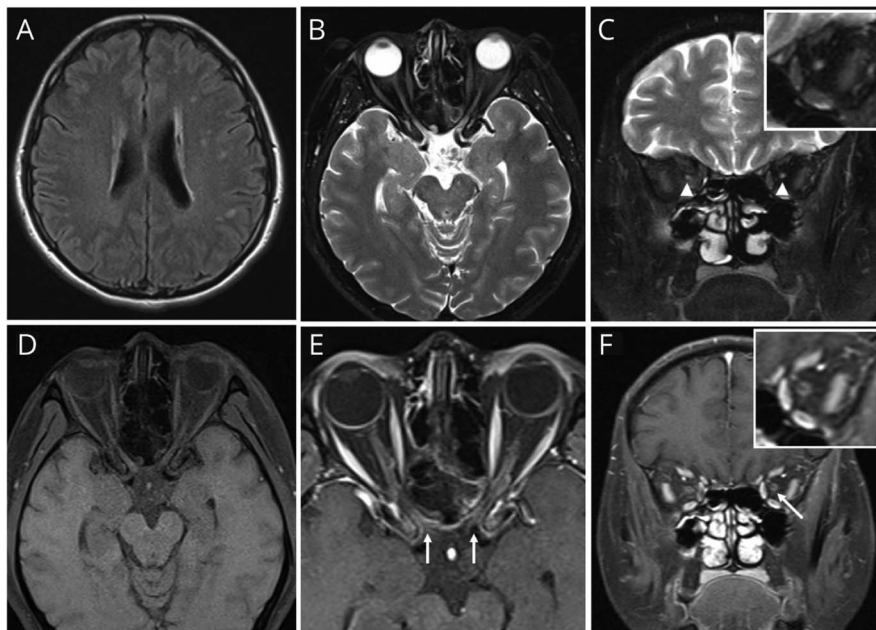
From the Departments of Neurology (Y.H., Yulu Liu, X.F., L.Z., Q.X.); Radiology (Yongguang Liu); and Ophthalmology (Q.L.), Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China.

Go to Neurology.org/N for full disclosures. Funding information and disclosures deemed relevant by the authors, if any, are provided at the end of the article.

The Article Processing Charge was funded by the authors.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License 4.0 (CC BY-NC-ND), which permits downloading and sharing the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Figure 2 Brain MRI Images



FLAIR (A) showed white matter lesions. T2-hyperintense lesions and atrophy in the bilateral optic nerve (arrowhead) were observed (B–C). T1-fat-saturation (D) and T1-gadolinium enhancement (E–F) demonstrated the entire optic nerve sheath (including chiasmal) (arrow).

enhancement (Figures 1–2). The patient received penicillin and oral prednisolone, which improved her vision. Infectious causes of optic neuritis are complex (Table).^{1,2} NGS is an emerging method with the potential to rapidly identify atypical optic neuritis.

Acknowledgment

We thank the following for their collaboration and resources: Genskey Medical Technology Co., Ltd, Beijing, China, and the Genskey Medical Database, a self-constructed microbial

genome database based at the National Center for Biotechnology Information (Genbank).

Study Funding

The authors report no targeted funding.

Disclosure

The authors report no disclosures relevant to the manuscript. Go to Neurology.org/N for full disclosures.

Table Common Pathogens of Infectious Optic Neuropathies

Viral

Herpes simplex virus, Epstein-Barr virus, chikungunya virus, dengue virus, Influenza viruses, mumps virus, varicella-zoster virus, cytomegalovirus, human immunodeficiency virus, measles virus, Rift Valley fever virus, rubella virus, zika virus, West Nile virus

Bacterial

Treponema pallidum, *Mycobacterium tuberculosis*, *Bartonella henselae* bacteria, *Rickettsii*, bacterium *Borrelia burgdorferi*, Leptospire, *Tropheryma whipplei*, *Mycobacterium leprae*, *Brucella* genus

Fungi

Cryptococcus neoformans, Mucorales

Parasites

Toxoplasma gondii, *Toxocara canis*, *Toxocara cati*, Plasmodium, Nematodes, *Onchocerca*

Note: All pathogens listed in the table can be detected through next generation sequencing.

Appendix Authors

Name	Location	Contribution
Ying Huang	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Drafting/revision of the manuscript for content, including medical writing for content, major role in the acquisition of data, and analysis or interpretation of data
Yulu Liu	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Major role in the acquisition of data
Yongguang Liu	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Major role in the acquisition of data

Continued

Appendix (continued)

Name	Location	Contribution
Qiang Li	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Major role in the acquisition of data
Xuejun Fu	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Major role in the acquisition of data and study concept or design
Liangyu Zou	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Major role in the acquisition of data

Appendix (continued)

Name	Location	Contribution
Qianhui Xu	Shenzhen People's Hospital (The Second Clinical Medical College, Jinan University, The First Affiliated Hospital, Southern University of Science and Technology), Shenzhen, China	Drafting/revision of the manuscript for content, including medical writing for content, major role in the acquisition of data, study concept or design, and analysis or interpretation of data

References

1. Eggenberger ER. Infectious optic neuropathies. *Continuum (Minneapolis, Minn)*. 2019; 25(5):1422-1437.
2. Abel A, McClelland C, Lee MS. Critical review: typical and atypical optic neuritis. *Surv Ophthalmol*. 2019;64(6):770-779.

Neurology[®]

Teaching NeuroImage: Rapid Identification of Infectious Optic Neuritis by Next-Generation Sequencing

Ying Huang, Yulu Liu, Yongguang Liu, et al.

Neurology 2022;98:e872-e874 Published Online before print December 16, 2021

DOI 10.1212/WNL.0000000000013213

This information is current as of December 16, 2021

Updated Information & Services	including high resolution figures, can be found at: http://n.neurology.org/content/98/8/e872.full
References	This article cites 2 articles, 0 of which you can access for free at: http://n.neurology.org/content/98/8/e872.full#ref-list-1
Citations	This article has been cited by 1 HighWire-hosted articles: http://n.neurology.org/content/98/8/e872.full##otherarticles
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): All Immunology http://n.neurology.org/cgi/collection/all_immunology Bacterial infections http://n.neurology.org/cgi/collection/bacterial_infections Optic nerve http://n.neurology.org/cgi/collection/optic_nerve Visual loss http://n.neurology.org/cgi/collection/visual_loss
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.neurology.org/about/about_the_journal#permissions
Reprints	Information about ordering reprints can be found online: http://n.neurology.org/subscribers/advertise

Neurology® is the official journal of the American Academy of Neurology. Published continuously since 1951, it is now a weekly with 48 issues per year. Copyright © 2021 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of the American Academy of Neurology. All rights reserved. Print ISSN: 0028-3878. Online ISSN: 1526-632X.

