NEUROIMAGES

Bilateral transient olfactory bulb edema during COVID-19–related anosmia

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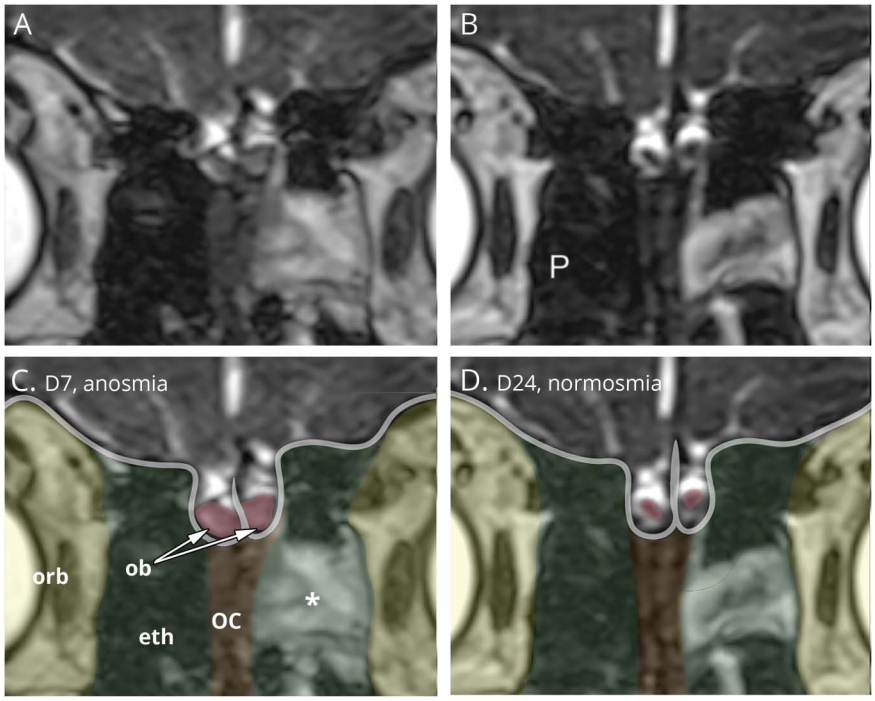
Figure Transient olfactory bulb edema



Coronal 3D constructive interference in steady-state T2-weighted imaging (1.5T) during anosmia (day 7; A, C) compared to recovery (day 24; B, D). MRI shows olfactory bulb (ob; pink) transient volume and signal increase, olfactory cleft edema (OC; brown), and focal left ethmoid (eth; green) sinusitis (*), and normal cranial fossa (gray line) and orbit (orb; yellow).

An asymptomatic 27-year-old man was diagnosed with coronavirus disease 2019 (COVID-19) by occupational medicine after contagion (reverse transcription polymerase chain reaction [*RT-PCR*]). Four days after the diagnosis, he experienced complete anosmia and dysgeusia.[1] On day 7, 1.5T MRI showed signs of bilateral olfactory bulb edema on 3D constructive interference in steady state T2-weighted imaging, demonstrated by severe enlargement[2] (left: 73 mm^3, right: 64 mm^3) and an abnormally high signal intensity (figure). Olfactory clefts showed mild edema. The olfactory pathways, including the cortical projections (fluid-attenuated inversion recovery and diffusion-weighted imaging not shown), were normal. Sensory recovery and negative RT-PCR (positive on days 1, 2, and 10) appeared on day 14.

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MRI on day 24 confirmed the normalization of olfactory bulb signal and volumes (left: 22 mm^3, right: 17 mm^3).

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Disclosure

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Name	Location	Contribution
Thomas Laurendon, MD	Department of Medical Imaging, Conception University Hospital, Aix-Marseille University, Marseille, France	Traced the patient's entire history, including biological history and management, wrote the manuscript
Thomas Radulesco, MD, PhD	Department of ENT surgery, Conception University Hospital, Aix-Marseille University, Marseille, France	Examined the patient and performed sensory testing, corrected the manuscript
Justine Mugnier, MD	Department of Medical Imaging, Conception University Hospital, Aix-Marseille University, Marseille, France	Performed the bibliography and image analysis (volume and signal intensities), corrected the manuscript
Mélanie Gérault, PhD	Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge	Supervised manuscript corrections and provided substantial mathematical help in checking the volume calculations by triple checking with Horos program, oro.dicom under R statistics, and geometrical length model
Christophe Chagnaud, MD, PhD	Department of Medical Imaging, Conception University Hospital, Aix-Marseille University; Center for Magnetic Resonance in Biology and Medicine, La Timone University Hospital, Aix-Marseille University, Marseille, France	Department Chief; took part in ethical considerations, corrected the manuscript
Ahmed-Ali El Ahmadi, MD	Department of Medical Imaging, Conception University Hospital, Aix-Marseille University, Marseille, France	Responsible for image acquisitions, editorial, manuscript correction, took part in the submission process
Arthur Varoquaux, MD, PhD	Department of Medical Imaging, Conception University Hospital, Aix-Marseille University; Center for Magnetic Resonance in Biology and Medicine, La Timone University Hospital, Aix-Marseille University, Marseille, France	Supervised work, took part in ethical consideration, acquisition parameters, manuscript correction and submission

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