



Post COVID-19 Rhino-Orbital-Cerebral Mucormycosis: The Guitar Pick Sign

COVID-19 Sonrası Rino-Orbito-Serebral Mukormikoz: Gitar Penası İşareti

✉ Kiran Kumar Ramineni¹, ✉ Krishna Mohan Reddy Gangireddy², ✉ Ugandhar Bhattu Chakrahari³,
✉ Ravi Kanth Jakkani⁴, ✉ Sashidhar Reddy Gutha²

¹Yashoda Superspeciality Hospital, Clinic of Neurology, Hyderabad, India

²Yashoda Superspeciality Hospital, Clinic of Internal Medicine, Hyderabad, India

³Yashoda Superspeciality Hospital, Clinic of Pulmonology, Hyderabad, India

⁴Yashoda Superspeciality Hospital, Clinic of Radiology, Hyderabad, India

Keywords: COVID-19, guitar pick, mucormycosis, orbital cellulitis, magnetic resonance imaging

Anahtar Kelimeler: COVID-19, gitar penası, mukormikoz, orbital selülit, manyetik rezonans görüntüleme

Dear Editor,

A 55-year-old female patient with a history of left periorbital pain, redness, eye swelling with a blurring of vision, and nasal discharge for 5 days was brought to the emergency department. Two days after the onset, similar but less severe symptoms developed on the right side. On the day of presentation, the patient developed right upper and lower limb weakness and was unable to speak. She was diagnosed with coronavirus disease-2019 (COVID-19) (reverse transcription polymerase chain reaction confirmed) 20 days before; treated at a local hospital with remdesivir, dexamethasone, doxycycline, and symptomatic medication; and discharged after stabilization.

The vitals recorded were 37.5 °C body temperature, 130/90 mmHg blood pressure, and 96% oxygen saturation in room air. Neurological examination revealed dense right hemiplegia with global aphasia. A significant left side proptosis, periorbital tenderness, chemosis, and non-reactive left pupil were observed, and the right pupil was sluggishly reacting to light with mild conjunctival congestion. Additionally, sinus tenderness with the blackish nasal discharge was noted. A left>right sinusitis and orbital cellulitis with a cerebrovascular accident was suspected. Further, MRI brain with magnetic resonance angiography revealed pan sinusitis and retro-orbital inflammation with bilateral posterior globe tenting (left>right) with an acute angle

that showed a guitar pick appearance (Figure 1). Moreover, a large left-hemispheric infarct with internal carotid artery occlusion and cavernous sinus inflammation was noted (Figure 2).

Endoscopic sinonasal sampling confirmed mucormycosis. Routine laboratory investigations were unremarkable except for an unusual elevated blood sugar of 260 mg/dl. The patient was admitted to the intensive care unit and was administered liposomal amphotericin b, broad-spectrum antibiotics, and anti-cerebral edema measures along with supportive care. Due to poor prognosis attendants of the patient opted for rehabilitative care and did not follow up.

Various factors in association with COVID-19, such as co-existing diabetes mellitus, corticosteroid consumption, and immune dysregulation, may result in severe secondary infections, including bacterial and invasive fungal infections (1). The guitar pick sign was initially described as an ocular ultrasonography finding with conical deformation of the posterior globe in retrobulbar hemorrhage and a rise in intraocular and intraorbital pressure, which was reversible with lateral canthotomy (2). Indiran (3) described similar findings on orbital magnetic resonance imaging in a case of invasive aspergillosis with extensive orbital cellulitis.

Posterior eye globe deformation can be induced by bulging posterior sclera and staphyloma, retrobulbar hemorrhage, and

Address for Correspondence/Yazışma Adresi: Ravi Kanth Jakkani MD, Yashoda Superspeciality Hospital, Clinic of Radiology, Hyderabad, India
Phone: +91 9177534069 E-mail: ravikanthjakkani@gmail.com ORCID: orcid.org/0000-0002-7371-9273

Received/Geliş Tarihi: 29.05.2021 **Accepted/Kabul Tarihi:** 23.11.2021

©Copyright 2021 by Turkish Neurological Society
Turkish Journal of Neurology published by Galenos Publishing House.

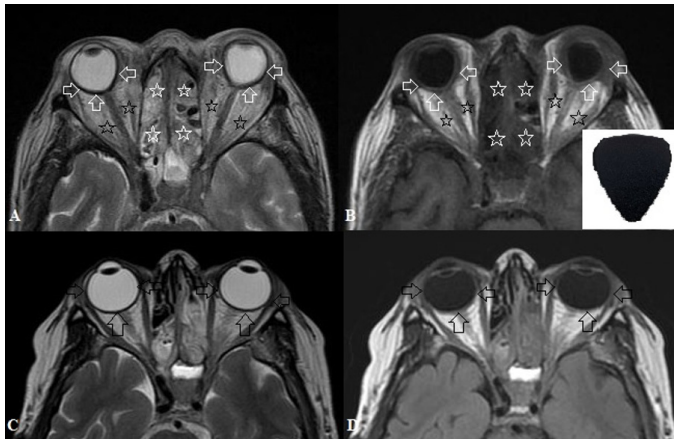


Figure 1. Axial T2 and T1 images (A, B) of orbits and paranasal sinuses showing bilateral eyeball deformity, which is more prominent on the left side with tenting of the posterior globe (white open arrows) showing a guitar pick appearance in the inset image. Inflammatory changes were seen in the bilateral orbits (black asterisk) and sinusitis in sphenoidal and ethmoidal sinuses (white asterisk). Bottom axial T2 and T1 images (C, D) of another patient showing normal spherical contours of eyeballs (black open arrows)

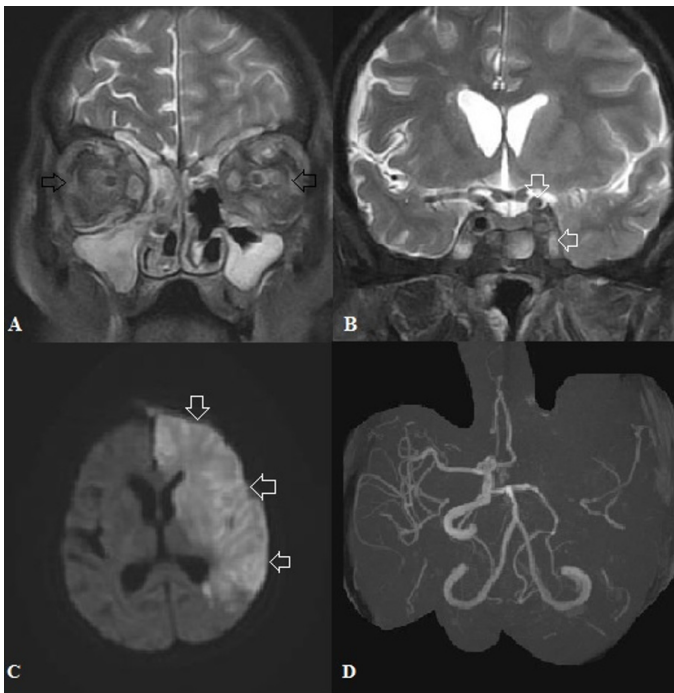


Figure 2. Coronal T2 FatSat images (A, B) of orbits showing bilateral orbital cellulitis (open black arrows) with left cavernous sinus involvement and soft tissue thickening along with loss of flow void in the cavernous internal carotid artery (ICA) suggesting thrombosis (white open arrows). DWI image (C) showing a large acute infarct in the left ICA territory with complete loss of signal in the left intracranial ICA suggesting thrombosis in MRA image (D)

MRA: Magnetic resonance angiography, DWI: Diffusion-weighted imaging

globe rupture, among others, which is often associated with irreversible vision loss (2,3).

The COVID-19 pandemic resulted in a massive surge of mucormycosis with pansinusitis, which can contiguously spread and result in orbital cellulitis with potential permanent vision loss. Significant neurological disability is expected with vascular invasion and intracerebral extension. Early orbital and brain imaging that detects this guitar pick sign may help clinicians optimize the management and prognosis.

Ethics

Informed Consent: Informed consent was obtained.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: K.K.R., K.M.R.G, S.R.G., R.K.J., U.B.C., Concept: K.K.R., K.M.R.G, S.R.G., U.B.C., Design: K.K.R., S.R.G., R.K.J., U.B.C., Data Collection or Processing: K.K.R., K.M.R.G, R.K.J., Analysis or Interpretation: K.K.R., K.M.R.G, S.R.G., U.B.C., Literature Search: K.K.R., K.M.R.G, S.R.G., R.K.J., Writing: K.K.R., K.M.R.G, R.K.J.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Mehta S, Pandey A. Rhino-Orbital Mucormycosis Associated With COVID-19. *Cureus* 2020;12:e10726.
2. Theoret J, Sanz GE, Matero D, et al. The "guitar pick" sign: a novel sign of retrobulbar hemorrhage. *CJEM* 2011;13:162-164.
3. Indiran V. "Guitar pick sign" on MRI. *Indian J Ophthalmol* 2019;67:1737.