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CLINICAL IMAGE

Cogan syndrome following SARS-COV-2 infection

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Presentation

A 61-year-old man presented with a 2-month history of tinnitus, progressive hearing loss, and a 2-week history of generalized joint pain, blurred vision, and redness in both eyes. He also had a high fever for the first 2 days and a positive PCR test for SARS-COV-2 RNA. On admission, he was afebrile, and the physical examination revealed bilateral conjunctival congestion (Fig. 1A). The right knee and interphalangeal joints were swollen and tender. A laboratory evaluation showed elevated CRP (19 mg/L) and ESR (40 mm/h). Autoantibodies (such as ANA, ENA, and ANCA) and pathogen examinations including treponema pallidum were negative. The audiometry indicated moderate to severe mixed deafness, and the internal otoscopy revealed left-sided secretory otitis media. Similarly, the MRI showed left-side otitis media and mastoiditis (Fig. 1B). Based on these data, we diagnosed Cogan syndrome (CS) after excluding syphilis, ANCA-associated vasculitis and other autoimmune diseases. With high-dose methylprednisolone (120 mg daily), his hearing and vision improved. After the tapering of glucocorticoid, he was treated with intravenous cyclophosphamide monthly, and the symptoms ameliorated significantly.

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Discussion

CS is a rare autoimmune systemic vasculitis of unknown etiology, characterized by ocular inflammation and vestibuloauditory dysfunction [1]. The pathogenic mechanism of COVID-19-associated vasculitis is not fully understood. It is thought that SARS-COV-2 may increase angiotensin II, while the type I interferon response to the SARS-COV-2 may decrease nitric oxide production [2, 3]. Furthermore, immune dysregulation

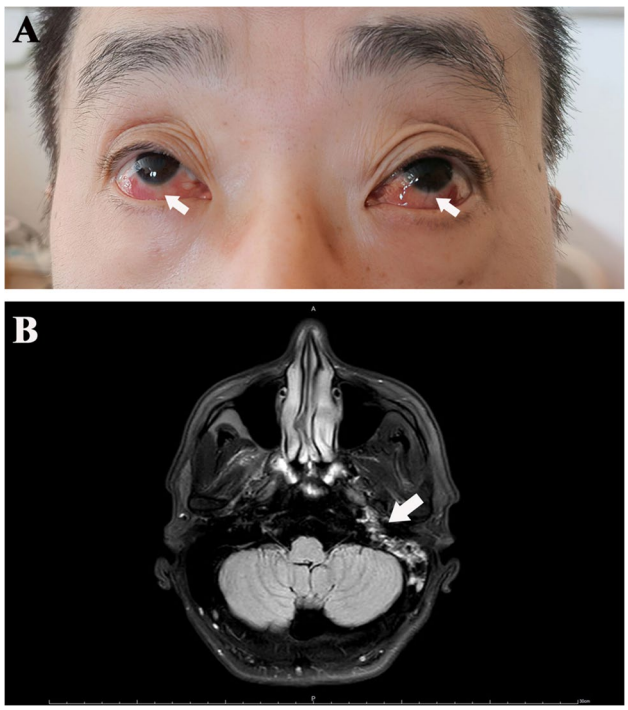

Fig. 1 **A** Photograph of the patient's eyes with bilateral conjunctival congestion. **B** The MRI (T2-weighted) shows left-side otitis media and mastoiditis

and autoantibody reactions can also be involved in the pathogenesis [4]. These changes can result in vasoconstriction and endothelial damage, and ultimately lead to vasculitis [5].

In summary, our report deepens the understanding of the link between COVID-19 and systemic vasculitis, but the phathogenesis of COVID-19-related vasculitis requires further investigation. Vasculitis triggered by COVID-19 has a reported worldwide prevalence, of which timely diagnosis and treatment can significantly improve the prognosis.

Data availability The clinical data of the patient will be shared on reasonable request to the corresponding author.

Compliance with ethical standards

Ethics approval This study was approved by the Institutional Research Ethics Committee of Ruijin Hospital (2016–62), Shanghai, China, which was performed following the Declaration of Helsinki and the Principles of Good Clinical Practice. Informed consent was obtained from recruited subjects.

Consent for publication Informed consent was obtained from the patient to publish this case and related clinical image.

Disclosures None.

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