Brown syndrome secondary to SARS-COV-2

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A 51-year-old white male developed vertical binocular diplopia two days before consultation. On ocular examination the patient was found to have 10 prism diopters left hypotropia in primary gaze, an inability to elevate the left eye in an adducted position (Figure 1). Forced duction testing was positive for restriction of up gaze in the adducted position. No limitation of depression of the left eye in adduction was found, and no restriction of elevation of the left eye in abduction was noted. During examination, he also referred tenderness to palpation over the superonasal bony orbit.

Axial and coronal computed tomography scans of the orbits showed an enlargement of superior oblique tendon and trochlea of the left side, respectively. (figure 2 and figure 3) Two days after the first visit the patient referred high fever, fatigue, myalgia, arthralgia, and headache and dry cough and test for SARS-COV-2 was done and it was positive. The patient received treatment with Zinc, Vitamin C, Vitamin D, Remdesivir and 800 milligrams of ibuprofen TID were administered. Three weeks later the patient returned referring significant improvement, with mild diplopia exclusively in up gaze in adducted positions (Figure 4).

Brown Syndrome is a rare form of strabismus, that affects slightly more females than males. Typical presentation is inability to elevate the eye in adduction, along with vertical diplopia, primarily in supraduction and to the contralateral side of the affected eye. This occurs due to tightening of the posterior fibers of the tendon, impeding correct pulley-like movement. They might adopt chin elevation and face turn to compensate for diplopia. Guyton’s exaggerated forced duction testing will reveal restriction upon inward and upward movements, confirming the diagnosis of restrictive strabismus.

It can be congenital or acquired and is generally unilateral at presentation. Acquired Brown syndrome has been described to arise secondary to trauma, inflammation, sinusitis or eyelid
surgery, even autoimmune diseases like psoriatic arthritis. For instance, orbital imaging and blood panel should be indicated upon presentation.

Congenital Brown syndrome can be self-limited, and others may require surgery (sheathectomy with inferior oblique tuck). Acquired disease might have a recurrent course and can be treated using oral antinflammatory therapy.

Bone, joint and muscle involvement in SARS-COV-2 infection has been widely documented since 2020. Even reduced bone mineral density independent to the corticosteroid therapy has been reported. Secondary throcleitis and tendinitis is just proof to how far can it go.


Figure Legends:

Figure 1: Initial presentation of the patient. Evidenced limitation to elevation in adduction of the left eye and 10 prism diopter hypotropia of the left eye in primary gaze.
Figure 2: Axial computed tomography of the orbit showing marked left superior oblique tendon inflammation (arrow).
Figure 3: Coronal computed tomography of the orbit showing marked left trochlear inflammation (arrowhead).
Figure 4: Almost one month posterior to the initiation of treatment. No limitation to elevation in adduction or hypotropia.
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