



## A Rare Case of Ciliary Ganglionopathy in COVID-19 Patient

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*COVID-19; SARS-CoV-2 is a virus belonging to the Coronaviridae family and the causative agent of the current COVID 19 pandemic, have different neuro-ophthalmological symptoms reported such as headache, dizziness, consciousness impairment, and anosmia [1]. More recently, some cases of Guillain-Barre syndrome (GBS), mono or polyneuritis cranialis, and complete Miller-Fisher syndrome have broadened the neurological spectrum [2]. Here, we report a case of bilateral ciliary ganglionopathy in an adult female. There are many cases of tonic pupil reported in this particular context.[3][4]*

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### I. CASE REPORT

A 34-year-old female with an antecedent of occasional vascular headaches attended our hospital reporting a 5-day history of both eye blurred vision, headache and photophobia. She had no pain on ocular movement and no associated tinnitus, vomiting, diplopia or transient visual obscurations. Two weeks prior, she had suffered a flu-like syndrome, including symptoms such as high fever, myalgia, intense coughing, and asthenia for 4 days and was diagnosed as COVID-19 case, confirmed by nasal swab reverse transcription polymerase chain reaction (RT PCR) was positive for SARS-CoV-2. She had no other symptoms of cranial or autonomic nervous dysfunction. Nasal swab for RTPCR was negative at time of presentation.

On examination, best corrected visual acuity was 6/6, N6 in both eyes with intact color vision and full and painless ocular movements. Pupillary evaluation revealed both eye dilated pupil with the right eye pupil being 9mm in ambient light and the left 9.2 mm. [image 1] Both eye pupil showed a sluggish reaction to direct light. There was a sluggish reaction to near response as well. All other anterior and posterior segment findings and visual fields were within normal limits. Her deep tendon reflexes were brisk and bilaterally symmetrical. Fundus of both eyes was within normal limits. A provisional diagnosis of both eye tonic pupil was made and denervation super sensitivity tested and proved with dilute pilocarpine (0.1%).

A cranial CT and a cerebral MRI enhanced with gadolinium revealed no abnormalities, including no signs of orbital inflammation. Chest X-ray was negative. Blood tests were normal—including thyroid function, serologies for syphilis, HIV. An autoimmunity panel including ANCA, ANA, Serum ACE was negative. Serum ADA negative, ESR in first hour-24mm. CSF analysis revealed occasional small lymphocytes. Microbiological and pathological analysis of the CSF were normal and was negative for ADA. Visual Evoked Potential (VEP) of both eye showed normal latencies and amplitude. When reviewed 2 weeks later, she complained of difficulty in focusing near objects with her right eye. Her pupillary status and light reaction were unchanged, however the near response showed tonic contraction of the right pupil more than left pupil. The patient was advised to use glasses for near vision and review after one month

### II. DISCUSSION

. Adie's pupil is a tonic, mydriatic pupil, due to an aberrant regeneration of parasympathetic nerve fibers after damage to the ciliary ganglion. As a result, fibers intended for the ciliary body will instead innervate the iris sphincter muscle [3] This fact justifies the absence of photomotor reflex but a tonic response of the pupil to the near vision. Most of the cases are idiopathic, either isolated or associated to generalized areflexia (i.e., Holmes-Adie syndrome). Nevertheless, often times, they have also been related to autoimmune diseases,

paraneoplastic entities, connective tissue diseases, and postinfectious conditions (i.e., syphilis, Lyme's disease, or herpes virus family)[3] The characteristic light near dissociation is due to inappropriate reinnervation and seen after a few weeks to a few months of onset of the disease.[4] Often it is idiopathic and known as Adie Syndrome. Occasionally, it may represent one manifestation of a widespread, peripheral and autonomic neuropathy and the involvement in such cases is often bilateral [5] Ordas CM et al. reported a case of concurrent tonic pupil and trochlear nerve palsy in COVID-19 and considered an immune mediated mechanism as cause for the same[6]

In our case as MRI Brain and CT scan came out to be normal with all other normal investigations we report our case as ciliary ganglionopathy to be caused by COVID -19 virus.

**Conflict of interest** The authors declare that they have no conflict of interest.

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**Pic 1.** Patient at time of presentation

