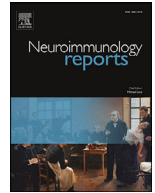




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Transverse myelitis as neurologic sequelae in a COVID-19 recovered patient

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ABSTRACT

Background: Months after the initial report of an unknown cause of pneumonia outbreak in Wuhan, China, the SARS-COV-2 continues its rampant spread globally. This novel corona virus has been known to cause severe respiratory illness. It is important to be wary of the complications that would soon present at the Out-patient centers after being cured from the infection.

Case: This is a case of a 59-year-old, female who came in at the Out-Patient Clinic with progressive bilateral pins and needles sensation of the feet after recovering from COVID-19 infection followed by a sensory level on T7-T10.

Case Report: Here we present a case of transverse myelitis as a complication of COVID-19 infection, the first to have occurred after recovery from the virus. With the success of treatments and recoveries, possible post infectious sequelae could be the next wave that could come into the present picture of the pandemic.

Conclusion: Post infectious transverse myelitis after recovering from COVID-19 is a possibility and that documentation of such cases and other complications must be reported.

Introduction

Months after the initial report of an unknown cause of pneumonia outbreak in Wuhan, China, the SARS-COV-2 continues its rampant spread globally. This novel corona virus has been known to cause severe respiratory illness. (Guan et al., 2020) Neurologic complications have been reported in case series and reports that suggest the possibility of debilitating immediate and post infectious sequelae of the COVID-19 pandemic. (Helms et al., 2020) As more patients recover, it is important to also be wary of the complications that would soon present at the Out-patient centers after being cured from the infection. Here we present the a case of transverse myelitis as a complication of COVID-19 infection and the first to have occurred after recovery from the virus.

Patient information and clinical findings

This is a case of a 59-year-old, healthy, female who came in at the Out-Patient Clinic with progressive bilateral pins and needles sensation of the feet. She had anosmia and flu like symptoms warranting a nasopharyngeal swab which turned out positive for COVID-19 on March 31, 2020. She was subsequently admitted April 1, 2020 as a case of

COVID-19 pneumonia and her symptomatic acute infection lasted for 15 days. During this admission, there was no sensory deficit or sensory level, no tingling sensation, and no motor weakness. She was discharged symptom-free after 3 weeks of hospitalization on April 25, 2020. About 1 week after recovery from her initial infection, she had recurrence of fever, throat pain, and maculopapular rashes on her trunk. She was readmitted on May 1, 2020 and was worked up for dengue, rubeola, and rubella which were negative. Repeat nasopharyngeal swab turned negative. She was managed with supportive care and spontaneously recovered. She was discharged after 1-week free from any symptoms until on her 7th week from her first infection, she had pins and needle sensation on her feet that persisted. On neurologic examination, she had no sensorial changes, no cranial nerve deficits, and no sensory deficits. She had areflexia on her lower extremities with muscle strength of 4/5. She was admitted for the 3rd time last May 20, 2020 and the initial impression during this time was a possible Guillain Barre Syndrome. However, during her first day in the hospital on her 3rd admission (May 21, 2020), she had band like sensation on her upper abdomen, and on repeat neurologic examination a sensory level on T7–10 was noted. Past medical history was unremarkable except her previous hospitalization from COVID-19. Summary of the clinical finding and evolution of symptoms are shown in Fig. 1.

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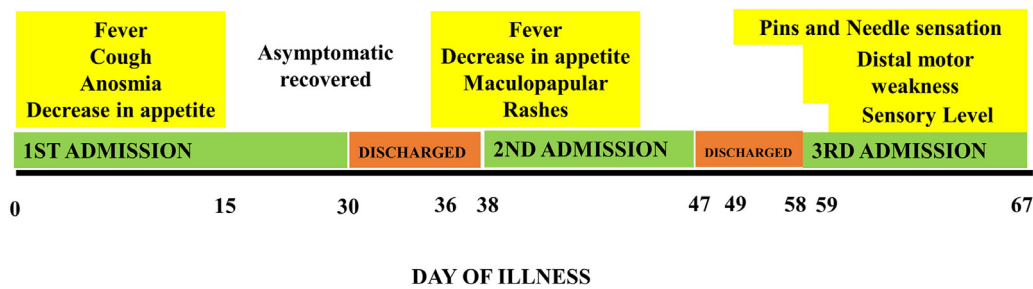


Fig. 1. Summary of symptomatology and timeline of events.

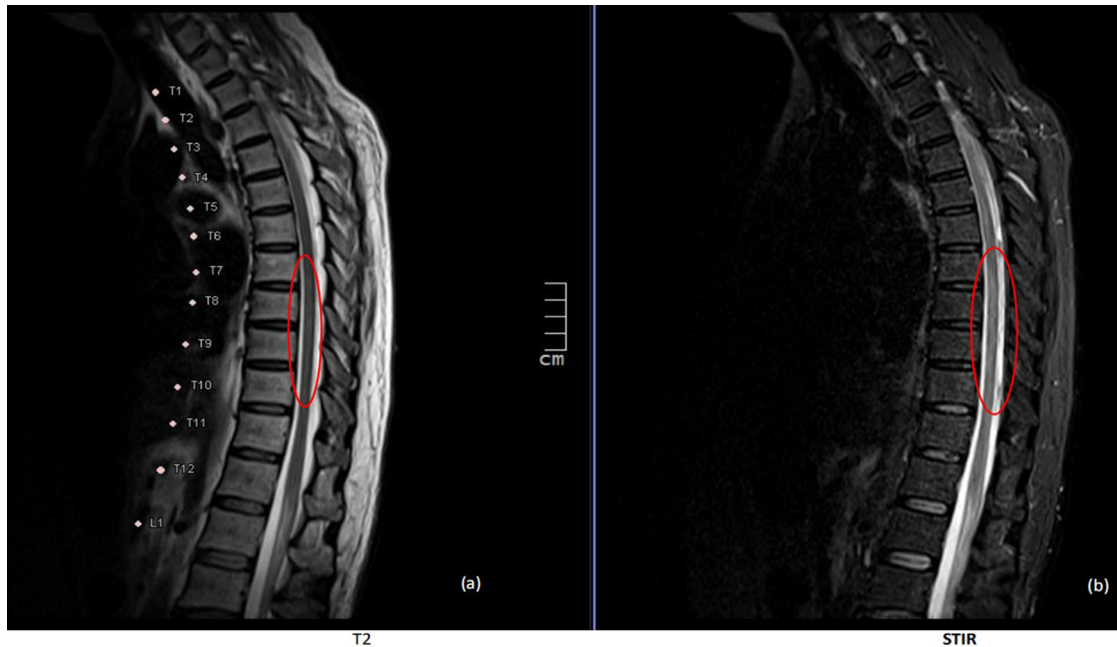


Fig. 2. (a) encircled in red shows long segment T2 sequence hyperintensity in T7-T10 (b) and hyperintensity on STIR.

Diagnostic assessment

An Electromyography and nerve conduction study of all extremities was done in the patient which did not show any demyelination. It was during the first hospital stay that a sensory level at the T7-T10 was noted on repeat neurologic examination. This warranted further investigation hence a cervico-thoracic magnetic resonance imaging plain and with contrast was done to visualize the spinal cord. The neuroimaging then revealed long segment hyperintensity on T2 and STIR sequences on T7–10 which are non-enhancing on gadolinium compatible with mild transverse myelitis. [Fig. 2]

When the patient came in as out-patient for the progressive bilateral pins and needles sensation on both feet, with significant neurologic finding of areflexia immediate work up for possible Guillain Barre syndrome was advised since during those times an associated Guillain Barre Syndrome in COVID-19 infection was already reported in journals. Nerve conduction studies were unremarkable and did not show any demyelination; During the 1st day of hospitalization on her 3rd admission, she had band like sensation on her upper abdomen, and on repeat neurologic examination a sensory level on T7–10 was noted. A cervico-thoracic MRI was done which showed long segment T2 and STIR hyperintensity with no enhancement on gadolinium contrast compatible with a mild transverse myelitis. Serum ANA, ESR and CRP was negative. Subsequent comprehensive workup for other possible etiology of the transverse myelitis is desirable however, absence of available CSF study for COVID-19 during this time in the Philippines, and financial constraints of the patient

for a more complete work up became a hindrance. Since the extensive neurologic examination rules out involvement of other parts of the central nervous system and absence of other symptoms rules out other possible etiology of transverse myelitis the team opted to perform a more cost-effective approach in the case. Due to the history of a recent infection from COVID-19, a post infectious transverse myelitis is most highly considered.

Therapeutic intervention

She was given 3-day course of high dose methylprednisolone therapy and was closely monitored for any adverse reactions. There were no untoward events during her treatment course.

Follow-up and outcomes

After the 3-day high dose methylprednisolone treatment, her neurologic status showed little improvement. There was no resolution of the band-like sensation on her upper abdomen, there was persistence of sensory level, and muscle strength remained 4/5 on both upper and lower extremities on discharge.

She was able follow up as Out Patient, utilizing teleconsultation with slight improvement of muscle weakness. Pins and needles sensation persisted along with the girdle-like sensation on her upper abdomen. There was no progression of her symptoms, no bowel and bladder changes were noted in the interim.

Discussion

The most common neurologic complication of severe COVID-19 infection that was first brought to attention was agitation and dysexecutive syndrome. (Helms et al., 2020) Various mechanisms as to how it affects the central nervous system has been reported and postulated due to its close resemblance to the structure of SAR-COV and MERS-COV. (Bohmwald et al., 2018) The significance of anosmia as one of the presenting symptoms strengthens the possibility that it can bring neurologic complications through direct invasion. (Zhou et al., 2020 May 26) It was a proposed mechanism that the presence of ACE2 receptors in the meninges and spine might contribute to the neurological manifestations of SARS-COV-2. (K. Zhao et al., 2020) Recent case studies showed that COVID-19 can be associated with Guillain-Barre syndrome, encephalitis, and acute ischemic stroke as a para-infectious complication as some even present initially with neurologic manifestations before being diagnosed with COVID-19 infection. (H Zhao et al., 2020; Toscano et al., April 17, 2020; Caamano and Beato, 2020 Jul; 77; Moriguchi et al., 2020; Oxley et al., 2020) It is known that transverse myelitis can be due to a recent infection or vaccination. (Frohman and Wingerchuk, 2010) Previous case studies have reported acute myelitis as a complication of COVID-19 infection, most of which had occurred a few days after the infection while still being hospitalized. (Frohman and Wingerchuk, 2010; Valiuddin et al., may; Sarma and Bilello, 2020 May) Our patient however has recovered two bouts of COVID-19 infection before experiencing neurologic symptoms, which continued to progress until a sensory level indicative of possible transverse myelitis had been apparent. Recently, cutaneous manifestations of COVID-19 infection have been reported. (Recalcati, 2020) This cutaneous manifestation could be brought about by viremia, and through this mechanism, a hematogenous route could also be postulated to have been responsible for the affectation of the central nervous system. (Bohmwald et al., 2018) A possible recurrence of COVID-19 after recovery has been reported in a case series. (Dominique Batisse MD Assistance 2020) Though the repeated nasopharyngeal swab turned negative, the association of symptoms and proximity from the initial infection make a COVID-19 recurrence more plausible. Though CSF COVID-19 testing was not done in our patient, other case reports of transverse myelitis was not able to get a positive CSF result. Only 2 known case reports so far have reported successful detection of the SARS-COV-2 in the CSF. This is the first case of transverse myelitis to have occurred post infection after hospitalization in the world as far as we know. The case in particular has a unique circumstance of experiencing neurologic symptoms 7 weeks from initial infection on an outpatient consultation free from any COVID-19 symptoms and has been considered recovered. This should raise vigilance amongst fellow physicians that after a surge of COVID-19 infection, comes a substantial number of recoveries that could present with neurologic complications that until now its mechanism of central nervous system affectation has not been fully understood.

Learning points

- This is the first case of transverse myelitis to have occurred post infection after recovery.

- It should raise the possibility that there could be an increased trend of out-patient neurologic consults after successfully recovering from COVID-19 infection.
- There is a wide array of possible complications of COVID-19 infection, hence it must be reported for dissemination of information.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.nerep.2022.100055.

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