Contents lists available at ScienceDirect



Multiple Sclerosis and Related Disorders

journal homepage: www.elsevier.com/locate/msard



Case report Atypical clinical and radiological presentation of multiple sclerosis: A case



Rina Ghorpade*, Ans Ahamad, Jennifer Bolyard

Canton Medical Education Foundation Northeast Ohio Medical University (NEOMED), Canton, Ohio, United States

ABSTRACT

report

A 59-year-old, previously healthy Caucasian female patient presented to the ED with a sudden onset of focal neurological deficit, with stable vital signs. Her initial physical examination revealed left-sided facial nerve palsy and right lower extremity weakness.

The CT head was negative for intracranial bleeding. Subsequently, during her hospital stay, the MRI brain with contrast demonstrated extensive white matter cystic lesions with vasogenic edema. However, after carefully ruling out stroke, metastatic disease, and infectious diseases like neurocysticercosis with radiological and serological tests, the diagnosis of demyelinating condition was presumed, and it was proven by consequent MRI of the brain and elevated IgG levels in the CSF. The patient's initial clinical presentation was pointing towards the diagnosis of ischemic stroke, while her initial MRI brain suggested the diagnosis of the space-occupying lesions, however, rapid recovery of the focal neurological deficit with steroids, and subsequent MRI brain and spine, and CSF tests confirmed the diagnosis of a demyelinating condition. The objective of this case report is to inform physicians that the clinical and radiological presentation of multiple sclerosis can be challenging; therefore, physicians should keep a high index of suspicion.

1. Case

59-year-old Caucasian female with no known past medical history presented to the emergency department (ED) with left-sided facial weakness, mild speech difficulty, dysphagia, weakness of bilateral lower extremities, urge urinary incontinence, and recurrent falls of oneweek duration before the ED visit. She lived alone, was unemployed, and volunteered at the horse farm. The patient denied recent illnesses, travel, or vaccination. Smoking history revealed a half pack per day for 30 years. She denied alcohol and recreational drug use. The patient had extensive exposure to cats and pigs. Review of systems was negative for fever, visual changes, headache, weight changes, heat or cold intolerance, hot flashes, psychiatric conditions, and any skin rashes. The general physical examination was normal. Admission blood pressure was 132/56 mmHg; pulse rate was 76/minute and regular. On neurological examination, the patient was conscious and alert and oriented to time, place, and person. Cranial nerve examination was remarkable for left nasolabial fold flattening and loss of forehead wrinkles. Motor examination revealed 3/5 strength in the right lower extremity. Deep tendon reflexes were brisk (+3) throughout. Gait could not be adequately assessed due to a complaint of unsteadiness. Sensations to light touch, temperature, vibration, and proprioception were normal throughout the body. There were no tremors or involuntary movements. Signs of meningeal irritation were negative. The pronator drift, plantar reflexes, and frontal release were negative. CT head without

contrast did not reveal an intracranial hemorrhage, hydrocephalus, or mass effect, but demonstrated nonspecific white matter hypodensities. EKG showed sinus rhythm, and a chest x-ray was negative for any abnormalities. Complete blood count (CBC) and basal metabolic panel (BMP) were unremarkable. However, creatinine phosphokinase (CPK) was mildly elevated 226 U/L (normal range in females: 26–192 U/L)

2. Hospital course

The patient was admitted to the hospital for a comprehensive diagnostic workup and monitoring. A presumptive diagnosis of ischemic stroke was made. The patient was started on aspirin, statin, and subcutaneous heparin for DVT prophylaxis. Echocardiography was done to rule out an embolic stroke and was found to be normal. CT angiogram of head and neck was negative for macrovascular angiopathy. MRI with contrast showed extensive multifocal white matter lesions involving the brainstem, bilateral cerebellar peduncles, right cerebellar hemisphere, bilateral occipital lobes, subcortical, and juxtacortical in bilateral cerebral hemispheres. Several lesions were found to be cystic in nature with surrounding vasogenic edema. At this point, the differential diagnosis of neurocysticercosis, toxoplasmosis, metastatic disease, and demyelinating conditions was presumed, and the fluoroscopic guided lumbar puncture with CSF analysis, blood culture, and serological tests were ordered. Aspirin and statins were discontinued, and dexamethasone was started for the vasogenic edema. To rule out metastatic

https://doi.org/10.1016/j.msard.2020.102457

Received 9 July 2020; Received in revised form 20 July 2020; Accepted 19 August 2020 2211-0348/ © 2020 Elsevier B.V. All rights reserved.

^{*} Corresponding author. *E-mail address*: rina.ghorpade@gmail.com (R. Ghorpade).

diseases, a head to toe physical examination was performed and was negative for signs of melanoma, lymphadenopathy, or breast masses.

CT scans of the abdomen, pelvis, and thorax with contrast were done to rule out malignancies. MRI of cervical and thoracic spines with contrast showed intramedullary lesions consistent with a demyelinating disorder.

The department of neurology was consulted, and the patient underwent extensive workup to rule out autoimmune and infectious causes. CSF analysis remained negative for infectious causes, including toxoplasmosis and neurocysticercosis. However, CSF IgG was found to be elevated, suggesting multiple sclerosis, which warranted the necessity to investigate the presence of IgG clonal bands, which was found to be present. Neurosurgery was consulted, but brain biopsy was deferred given the presence of a cyst in the white matter and the invasive nature of the procedure. Neurology recommended a 3-day trial of intravenous Solu-Medrol (Methylprednisolone) 1 gram daily and then have a repeat MRI of the brain to evaluate the response to steroids. Patient symptoms improved over time, and her speech was completely recovered. However, the unsteady gait persisted for which the patient was referred for physical therapy. Repeat MRI of the brain was after the 3-day trial of Solu-Medrol revealed improvement in the enhancement of ring-enhancing lesions in the brain. The patient was hemodynamically stable. The patient was then referred for rehabilitation and physical therapy and discharged with a plan to follow up with her primary care physician.

3. Discussion

Multiple sclerosis (MS) is an immune-mediated inflammatory disorder of the central nervous system affecting the synthesis of myelin. The most common presenting symptoms of relapsing-remitting MS are optic neuritis, internuclear ophthalmoplegia, transverse myelitis, and bladder dysfunction (Gelfand, 2014). Although focal weakness and spasticity are common manifestations of MS, stroke-like presentation of MS is rare, and there are only a few cases in the literature (Przeklasa-Auth et al., 2010, Cowan et al., 1990, Ogawa et al., 1999).

The usual age of presentation of MS is 20-40 with female preponderance, and the diagnosis after the age of 50 (late-onset MS) is infrequent but not rare (Polliack et al., 2001). Furthermore, the lateonset MS represents a diagnostic challenge, as in this age group, many entities like stroke and intracranial pathologies can mimic MS. This late-onset case of MS posed the diagnostic challenge due to its atypical age of development of symptoms mimicking stroke.

Our case started with a sudden onset of left-sided facial weakness and left lower extremity weakness, which subsequently improved with

Histoplasma Antibodies: Not detected

Blastomycosis serology: Negative

Table 1

Lab results.	
Blood test results	Cerebrospinal fluid analysis
CMP: Normal	Cells: RBCs:3/mm3, WBCs: 2/mm3
	Lymphocytes%: 92, Monocytes%: 8
CBC: Normal	Glucose: 93
Lipid panel: LDL: 129mg/dl, cholesterol: 227 mg/dl	Protein: 71.3
ESR: 10	CNS IgG synthesis: 51.2
C-ANCA, P-ANCA: Negative	IgG CSF: 13.1
West Nile virus panel: Negative	IgG oligoclonal bands: Positive
HIV serology: Negative	Bacterial culture: Negative
Hepatitis Serology: Negative	CSF Listeria monocytogenes: Not detected
Fungal serology: Negative	CSF HSV1 and 2: Not detected
RPR: Negative	CSF HHV6: Not detected
Electroimmunotransfer blot (EITB) for cysticercosis: Negative	CSF CMV: Not detected
Aquaporin 4 antibody: Not detected	CSF VZV: Not detected
Toxoplasma panel: Negative	CSF Cryptococcus: Not detected
NMO antibodies: Not detected	CSF Enterococcus: Not detected

Corticosteroids. The initial MRI brain demonstrated extensive white matter cystic lesions with vasogenic edema in the bilateral cerebral and cerebellar hemispheres and the brainstem. The common differential diagnosis of the cystic lesions in the brain includes metastatic brain disease, brain abscess, neurocysticercosis, sarcoidosis, primary CNS tumors, and demyelinating conditions (Prabhash et al., 2013). We excluded the metastatic brain disease by performing meticulous physical exams and CT scans of the abdomen, thorax, and pelvis.

Also, extensive serological workup was done to exclude infectious diseases. The CSF analysis showed the presence of elevated IgG levels and oligoclonal bands, which confirmed the diagnosis of MS. The diagnostic difficulties encountered revealed that MS can present with atypical symptoms; however, the stepwise and systematic approach can help to diagnose the challenging cases.



T2 weighted MRI with contrast in sagittal plane showing small cystic lesions with enhancement.

CSF Neisseria meningitides: Not detected

CSF Hemophilus influenzae: Not detected



T2 weighted MRI with contrast in trans-axial plane showing bilateral multiple small foci with enhancement.



T2 weighted cervical spine MRI with contrast in sagittal plane showing intramedullary lesions consistent with demyelinating pathology.

CRediT authorship contribution statement

Rina Ghorpade: Conceptualization, Methodology, Writing - original draft, Visualization. **Ans Ahamad:** Writing - review & editing, Resources. **Jennifer Bolyard:** Supervision.

Declaration of Competing Interest

The authors mentioned below declare that they have NO known competing financial interests or personal relationships that could have appeared to influence the work reported in this case report. We have not received any funding from any source.

References

- Cowan, J, Ormerod, IEC, Rudge, P, 1990. Hemiparetic multiple sclerosis. J. Neurol. Neurosurg. Psychiatry 53 (8), 675–680.
- Gelfand, JM, 2014. Multiple sclerosis: Diagnosis, differential diagnosis, and clinical presentation, 1st ed. Handbook of Clinical Neurology 122. Elsevier B.V., pp. 269–290. Available from: http://dx.doi.org/10.1016/B978-0-444-52001-2.00011-X.
- Ogawa, K, Kishi, M, Kurihara, T, Ikeda, K, Kinoshita, M, 1999. Multiple sclerosis with extensive lesions, left hemiplegia, mental dysfunction and retrobulbar neuritis.
- Psychiatry Clin. Neurosci. 53 (4), 485–490. Polliack ML, Barak Y, Achiron A. Late-Onset Multiple Sclerosis. 2001; 168–71.
- Poinack ML, Barak Y, Achiron A. Late-Onser Multiple Scierosis. 2001; 108-71.
 Prabhash, K, Noronha, V, Tandon, N, Joshi, A, Sharma, V, 2013. A systematic approach to diagnosis of cystic brain lesions. South Asian J. Cancer 2 (2), 98.
- Przeklasa-Auth, M, Ovbiagele, B, Yim, C, Shewmon, DA, 2010. Multiple sclerosis with initial stroke-like clinicoradiologic features: Case report and literature review. J. Child Neurol. 25 (6), 732–737.