Case 14052

Eurorad

Neurosyphilis: a case with bilateral mesiotemporal involvement

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Section: Neuroradiology
Area of Interest: Neuroradiology brain
Procedure: Imaging sequences
Imaging Technique: MR
Special Focus: Infection Case Type: Clinical Cases
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Patient: 35 years, male

Clinical History:

A 35-year-old man presented with seizures, altered mental status and dysphasia.
The blood tests showed a serology positive for syphilis. A lumbar puncture showed pleocytosis, elevated protein and increased IgG index. Treponemal serology was also positive in the CSF. The patient showed improvement of symptoms after initiation of treatment with penicillin.
Imaging Findings:

Figures 1 to 4: FLAIR sequence in the axial and coronal planes. Images show bilateral hyperintensities involving both temporal and left parietal lobes. In both hemispheres affectation of the medial temporal lobe exists, including the hippocampus. There is both cortical and subcortical white matter involvement. Despite the extent of the temporal hyperintensity, there is no mass effect and an enlarged temporal horn of the left lateral ventricle can be seen. No contrast enhancement was found.
Discussion:

Neurosyphilis is an infectious disease caused by invasion of the central nervous system by a spirochete named Treponema pallidum. It is a slow progressive, destructive infection that can occur at any stage of the disease process [1]. One third of patients who progress to tertiary syphilis develop neurosyphilis [1, 2].
Findings of neurosyphilis upon MRI are varied and commonly present as cerebrovascular disease-like changes, brain atrophy, and nonspecific white matter lesions in the temporal lobes [3].
Neurosyphilis commonly takes the meningeal or vascular form, and these often occur together. Imaging findings of meningovascular syphilis include both cortical and subcortical infarcts (25%), leptomeningeal enhancement associated with a clinical meningitis and arteritis. The arteritis is of two forms; Heubner arteritis, which is the more common form, affects the medium and large arteries, and the Nissl-Alzheimer form of arteritis, which affects the small arteries and arterioles [2].
The cause of the mesial temporal T2-weighted hyperintensity is unclear, but it is suggested that the signal changes represent a combination of vasogenic and cytotoxic oedema [1, 2] related to increased permeability of the blood-brain barrier and meningeal inflammatory reactions in small vessels [3]. The presence of gliosis may be present secondary to infection-induced small-vessel ischemic changes [2].
In neurosyphilis, mesial temporal hyperintensity includes some subtle temporal atrophy with slight enlargement of the temporal horns, rather than the mild mass effect that accompanies the profound cortical and subcortical oedema in acute herpes simplex virus infection [2, 4]. This is perhaps expected, because the course of neurosyphilis is more indolent than the fulminant course of herpes encephalitis [2]. In addition, gyral enhancement, signs of haemorrhage,

and areas of restricted diffusion are frequently described in viral encephalitis, but typically absent in neurosyphilis [3, 5].
Early diagnosis of neurosyphilis and appropriate antibiotic treatment make notable clinical improvement. However, the clinical diagnosis of neurosyphilis is often difficult because most patients are asymptomatic or present with nonspecific symptoms such as memory disturbance, disorientation, mental confusion, or seizures. Because syphilis serology is not routinely tested in patients with seizures or amnesia, radiologists should raise suspicion of neurosyphilis as well as limbic encephalitis when mesiotemporal signal changes are seen on MRI.
Differential Diagnosis List: Neurosyphilis, 1. Herpes encephalitis, 2. Paraneoplastic limbic encephalitis, 3. Bihemispheric diffuse glioma, 5. Vasculitis, 4. Neurosyphilis

Final Diagnosis: Neurosyphilis

References:

Jeong YM, Hwang HY, Kim HS (2009) MRI of Neurosyphilis presenting as Mesiotemporal Abnormalities: a Case Report. Korean J Radiol 10:310-12 (PMID: 19412521)
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Xiang T1, Li G, Xiao L, Chen S, Zeng H, Yan B, Liang Y (2013) Neuroimaging of six neurosyphilis cases mimicking viral encephalitis. J Neurol Sci 334:164-66 (PMID: 24007871)
Denays R, Collier A, Rubinstein M, Atsama P (1999) A 51 year-old woman with disorientation and amnesia: case report. Lancet 354:1786 (PMID: 10577641)
Vieira Santos A, Matias S, Saraiva P, Goulão A (2005) Differential diagnosis of mesiotemporal lesions: case report of neurosyphilis. Neuroradiology 47:664-67 (PMID: 16021441)

Figure 1

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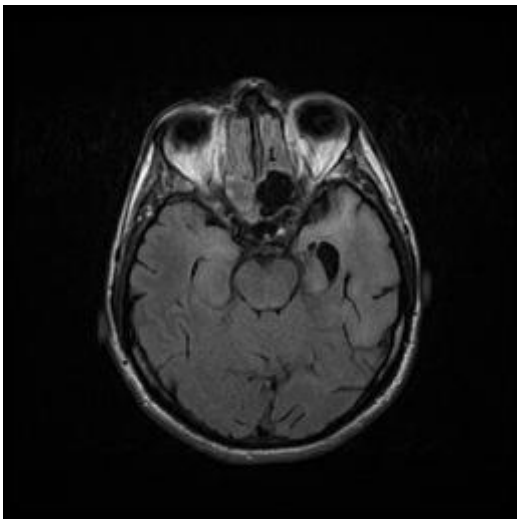
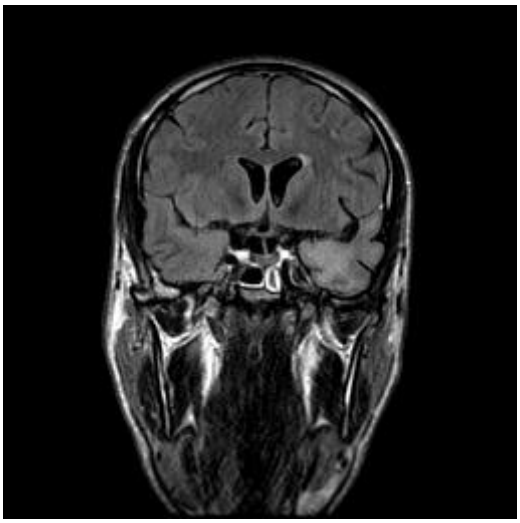


Description: Axial FLAIR shows bilateral temporal hyperintensities with an enlarged temporal horn of the left lateral ventricle. **Origin:** Hilario A, Department of Radiology, Neuroradiology Section, Hospital 12 de Octubre, Madrid, Spain

Figure 2

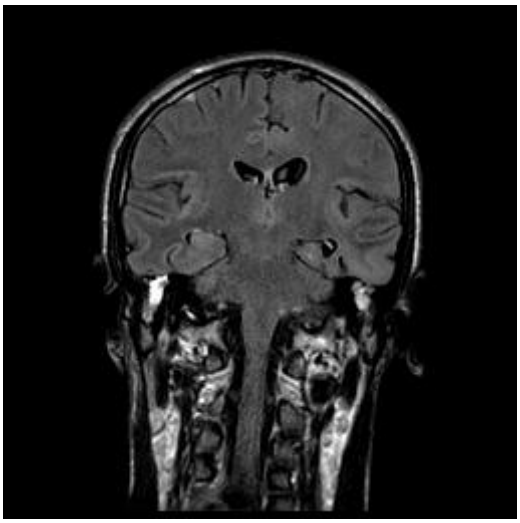
a



Description: Coronal FLAIR shows cortical and subcortical white matter involvement of the left parietal lobe **Origin:** Hilario, A. Department of Radiology. Neuroradiology Section. Hospital 12 de Octubre. Madrid, Spain

Figure 3

a



Description: Coronal FLAIR shows a bilateral involvement of the hippocampus with a dilated temporal horn of the left lateral ventricle **Origin:** Hilario A, Department of Radiology, Neuroradiology Section, Hospital 12 de Octubre, Madrid, Spain

Figure 4

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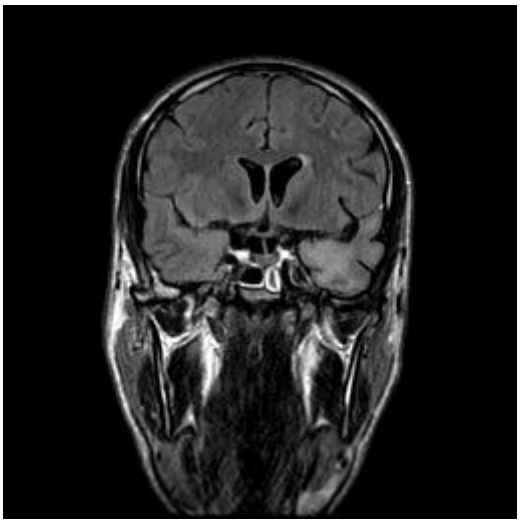

Description: Coronal FLAIR depicts a bilateral mesiotemporal lobe involvement **Origin:** Hilario A, Department of Radiology, Neuroradiology Section, Hospital 12 de Octubre, Madrid, Spain