Steroid-Responsive Encephalomyelitis Associated with Anti-SOX1 Antibodies and a Suspected Neurohypophyseal Tumor: A Case Report of an Unusual Paraneoplastic Presentation.

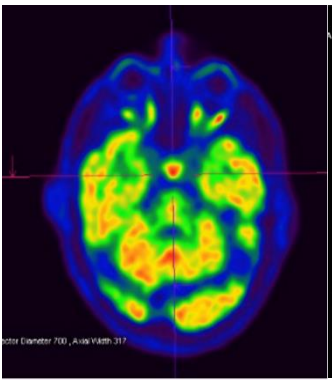
Davide Di Mare, Danial Mirkarimi, Marco Zoccarato, Maurizio Corbetta

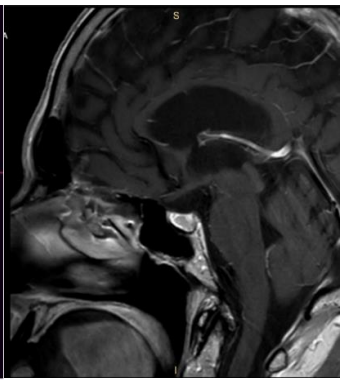
Introduction Paraneoplastic neurological syndromes (PNS) are rare neurological disorders caused by an immune response directed against antigens shared by tumor cells and neurons. The identification of anti-neuronal autoantibodies supports the diagnosis of PNS.

The anti-SOX1 antibody is an autoantibody associated with PNS and targets a family of developmental transcription factors from the Sry-like high mobility group superfamily, predominantly expressed in the nuclei of Bergmann glial cells in the, adult cerebellum.

Neurologically, the anti-SOX1 antibody has been described in the context of paraneoplastic Lambert-Eaton myasthenic syndrome and other clinical phenotypes, such as peripheral neuropathies. The tumor most frequently associated is small cell lung cancer (SCLC).

Case description: A 69-year-old man with a history of multiple sclerosis and non-muscle-invasive bladder cancer treated with radical cystectomy presented to the emergency department with two days of inappropriate behavior. A head CT scan was negative for acute findings. Neurological examination revealed confusion, aphasic speech with anomia, ideomotor apraxia, right homonymous hemianopsia, and a dystonic posture of the right hand. Prophylactic antibiotic and antiviral therapy was initiated, followed by high-dose intravenous methylprednisolone, with progressive clinical improvement. EEG





showed slow-wave abnormalities predominantly in the left fronto-centro-temporal regions, and levetiracetam therapy was started.

CSF analysis showed leukocytosis (9µL) without blood-brain barrier damage; microbiological tests were negative. However, both serum and CSF tested positive for anti-SOX1 antibodies via immunoblot assay. Due to suspicion of an underlying tumor, a whole-body PET-CT was performed, revealing a hypermetabolic area in the chiasmatic region. Brain and spinal MRI with contrast confirmed a mass in the neurohypophysis and signal alterations in the posterior columns of C2 and the posterolateral region of C3.

Table 5 PNS-Care Score

	Points
Clinical level	
High-risk phenotypes	3
Intermediate-risk phenotypes	2
Defined phenotype epidemiologically not associated with cancer	0
Laboratory level*	
High-risk antibody (>70% cancer association)	3
Intermediate risk antibody (30%–70%)	2
Lower risk antibody (<30%) or negative	0
Cancer	
Found, consistent with phenotype and (if present) antibody, or not consistent but antigen expression demonstrated	4
Not found (or not consistent) but follow-up <2 y	1
Not found and follow-up ≥2 y	0
Diagnostic level	
Definite ≥8	
Probable 6–7	
Possible 4–5	
Non-PNS ≤3	

Abbreviation: PNS = paraneoplastic neurologic syndrome.
* See text for recommended diagnostic methods.

A diagnosis of probable paraneoplastic encephalomyelitis (applyng the PNS-Care score) was made.

The hypophyseal mass was neither biopsied or resected and remained stable at 1-year follow-up.

Conclusions: Anti-SOX1 antibody positivity may suggest a paraneoplastic origin of a neurological syndrome. In this case, a steroid-responsive acute encephalomyelitis was observed in association with a probable neurohypophyseal tumor. This association has not been previously reported in the literature and "although not typical"emphasizes the importance of thorough oncological screening in patients with intracellular neuronal antibody positivity.

Bibliography:

1) Graus F., Updated Diagnostic Criteria for Paraneoplastic Neurologic Syndromes. 2021