A case of Immune Checkpoint Inhibitor associated Encephalitis

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Anamnesis: 60-year-old woman was admitted for acute global aphasia, no strength deficit, alert, no fever. In her medical history undifferentiated IV stage metastatic lung carcinoma, no brain metastases in a recent TB CT, treated with chemo-immunotherapy from November 2024, 4 cycles of Etoposide- Cisaplatin-Durvalumab with good response on lymph nodes but appearance of bone lesions in January 2025. She continued chemotherapy-immunotherapy until the previous month.

Fig.1

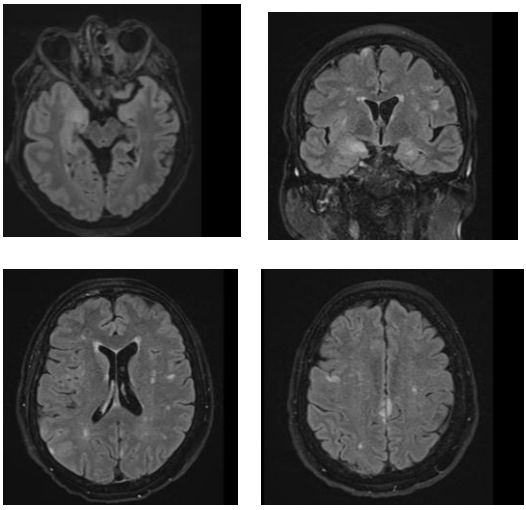
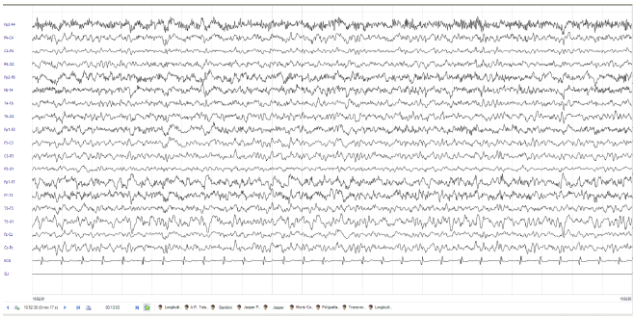


Fig.2



Diagnostic tests: at admission blood tests were normal, performed CT of intra-extracranic vessels negative for occlusions and metastatic lesions; after the exam she had a seizure treated with Diazepam iv. At recovery of the consciousness was overall slow down but with complete understanding and language improvement.

CSF showed 19 mononucleate cells, normal glucose and proteins, negative PCR Film Array for neurotropic agents and no growth at culture. Subsequently, also JCV, BK were tested resulting absent. Anti-onconeural and autoimmune encephalitis antibodies on serum and CSF resulted negative.

Quickly ***MRI*** of brain was perfomed showing "edema and swelling of the hippocampal cortex on the right side, with hyperintensity in the long TR sequences with shift of the median line (2-3mm). In flair post contrast and in DWI presence of multiple bi-hemispheric cortical areas of hyperintensity, the major in right fronto-parietal, left fronto-insular,left thalamus and parietal parafalcal at vertex, due to inflammatory lesions in encephalitis **(Fig.1).**

EEG performed after a few hours showed several prolonged sequences of slow waves, sharp-and-slow-wave complex or single spikes or sharp-waves in the left fronto-central-temporal site and/ or bilateral, consisting of ictal and interictal epileptiform discharges **(Fig.2).** During recording further seizure occurred so Levetiracetam 1000 mg three times a day was started.

Treatment: Initially antibiotic and antiviral treatments at dose of 10 mg/kg every 8 hours was administered, then considering no infectious agents on CSF or other potential sources of infection, we hypothesized an autoimmune encephalitis or ICIs-related (1,3). Methylprednisolone 1 g/iv for 5 days, with subsequent reduction of dose, was administered with anti-seizure drugs.

Conclusion:
patient improved language remaining ideational slowed down, oriented with short-term memory deficit. Oncological suggestion was to suspend the immunotherapy considering poor prognosis.

Discussion: the absence of autoimmune encephalitis antibodies, abrupt worsening and association with immunotherapy suggest a case of ICIs related Encephalitis; furthermore, despite the poor cancer prognosis neurological symptoms improved partially with steroid, moreover it is interesting because ICIs neurological events are significantly less frequent with the anti-PD-1 antibodies, as in our case, compared with CTLA-4 (2).

References:

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