## H46 An Autopsy Case of Suspected Anti-N-Methyl-D-Aspartate Receptor (NMDAR) Encephalitis

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The goal of this presentation is to present a case concerning NMDAR encephalitis, which is one of the autoimmune limbic encephalitides.

This presentation will impact the forensic science community by explaining the manner in which forensic pathologists may perform an autopsy in a case of undiagnosed NMDAR encephalitis.

N-methyl-D-aspartate (NMDA) is a glutamate receptor and ion channel protein found in nerve cells, including those of the hippocampus. Anti-NMDAR encephalitis is one of the autoimmune limbic encephalitis. This report is of an autopsy case of suspected anti-NMDAR encephalitis, based on the patient's past psychiatric history and autopsy findings of bilateral hippocampal sclerosis and ovarian teratoma.

**Introduction:** Anti-NMDAR encephalitis is one of the limbic encephalitis associated with anti-NMDAR antibodies. It often presents as acute psychosis and is associated with paraneoplastic syndromes of ovarian teratomas in adult women. Acute autoimmune limbic encephalitis typically begins with a prodromal viral illness before the onset of psychiatric symptoms, seizures, and autonomic failure. This report is of an autopsy case of suspected anti-NMDAR encephalitis, based on the patient's past psychiatric history and autopsy findings of bilateral hippocampal sclerosis and ovarian teratoma.

**Case Report:** A 51-year-old woman was found dead in the bathtub. She worked as a part-time cashier and lived with her parents. She had been diagnosed with schizophrenia and had been undergoing treatment for the past three years. After dinner, she went to the bathroom to take a bath and 30 minutes later was found in an unconscious state, drowned, and soaked in water in the bathtub. She did not respond to resuscitation. The computerized tomography of her brain during resuscitation attempts was unremarkable. To determine the cause of death, the autopsy was performed 12 hours after her death.

**Autopsy Report:** The decedent was 154cm in height and weighed 56kg. No remarkable external findings of the body were present. On autopsy, macroscopic examination revealed water aspiration in the lungs and a 2.5cm right ovarian cyst. Microscopic examination revealed mature cystic teratoma of the right ovary and severe bilateral hippocampal sclerosis. Alcohol and drugs were not detected by toxicological analysis of the blood. The autopsy findings put the diagnosis of schizophrenia into question, and the patient's past medical history was reviewed.

**Past History:** Three years previously, the woman was a graphic designer and had no past medical history of seizure or psychiatric illness. Her family history was unremarkable. She was married at 27 years of age but divorced at 40 years of age because of financial issues with her husband. Before the onset, the patient had complained of being very tired, which was attributed to her daily hard work to manage a financial problem; however, one day she presented with acute onset of psychiatric symptoms characterized by confusion, memory loss, hallucinations, disorganized thinking, and incoherent speech. Two days later, she was examined at a local hospital but there were no abnormal findings on examination. On the following day, she was referred to a psychiatric hospital for further evaluation; however, during transfer to the psychiatric hospital, she developed a generalized seizure with high fever (38.1°C, 100.58°F) and was brought to the emergency department of a different hospital. Blood tests revealed leukocytosis (white blood cells 19,500/μL) with a normal serum C-reactive protein level. Cerebrospinal fluid examination revealed acellular spinal fluid (white blood cells, 6/μL) with normal protein and glucose levels. Brain computerized tomography was normal. The psychiatric symptoms were so severe that she was referred to a psychiatric hospital on the same day. On admission, she was found to have fever and hypoxia due to pneumonia, for which oxygen and medication were initiated. A few days later, although the patient was able to communicate, she remained disoriented with short-term memory loss and persistent delirium symptoms. She was subsequently diagnosed with schizophrenia and discharged one and one-half months after the onset. After discharge, she was referred to a local psychiatric clinic and prescribed only hypnotic drugs.





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**Conclusion:** At the time of initial presentation, acute limbic encephalitis had not been suspected, and the patient had been diagnosed with schizophrenia; however, the autopsy findings and details of the initial clinical presentation strongly suggest that the patient had an acute limbic encephalopathy, such as anti-NMDAR encephalitis, rather than schizophrenia.

**NMDAR Encephalitis, Hippocampal Sclerosis, Teratoma**