Case Report

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2025.63.009944

Paraneoplastic Epilepsy Developed After Ovarian Cancer Cytoreduction

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ARTICLE INFO

Received: October 15, 2025

Published: November 06, 2025

Citation: Hiroshi Ishikawa, Shigeru Abe, Hitoshi Hasegawa, Satoshi Ichigo and Atsushi Imai. Paraneoplastic Epilepsy Developed After Ovarian Cancer Cytoreduction. Biomed J Sci & Tech Res 63(5)-2025. BJSTR. MS.ID.009944.

ABSTRACT

Paraneoplastic encephalitis, a rare subtype of autoimmune encephalitis, is frequently associated with malignant neoplasms such as lung and breast cancers. Typically, the tumor is identified during diagnostic evaluations following the onset of encephalitic symptoms and is considered a potential immunologic trigger. We herein report the case of a 71-year-old woman who developed autonomic dysfunction and epilepsy subsequent to primary cytoreductive surgery for clear cell ovarian carcinoma. Given that encephalitic symptoms manifested postoperatively, we propose that cytoreductive surgery may serve as a precipitating factor for autoimmune encephalitis. Surgeons should remain vigilant for patients who develop unexplained cognitive impairment or seizure-like episodes shortly after ovarian tumor resection, and paraneoplastic encephalitis should be considered in the differential diagnosis.

Introduction

Paraneoplastic encephalitis represents one of the most severe and prevalent forms of autoimmune encephalitis [1,2]. Patients typically present with acute or subacute onset of seizures, short-term memory deficits, psychosis, aphasia, dyskinesia, autonomic dysfunction, or altered consciousness. Underlying or recurrent neoplasms such as thymoma, breast, lung, or renal cancers are often identified during subsequent diagnostic evaluations [3-6]. However, its occurrence in association with ovarian carcinoma remains exceedingly uncommon. We describe a patient who developed paraneoplastic syndrome–related seizures following primary cytoreductive surgery for clear cell ovarian carcinoma. Despite intensive therapeutic intervention, her condition failed to improve, and serologic testing confirmed the presence of paraneoplastic antibodies.

Case Presentation

A 71-year-old Japanese woman (gravida 4, para 1) presented with a palpable lower abdominal mass. Her medical history was unremarkable. Magnetic resonance imaging revealed a right ovarian mass extending to the umbilical level, measuring 15 × 20 × 18 cm, with evidence of peritoneal and omental metastases. Exploratory laparotomy demonstrated extensive malignant deposits in the cul-de-sac with sacral involvement. A primary cytoreductive procedure (ascitic fluid aspiration, surgical exploration, omentectomy, total hysterectomy, and bilateral salpingo-oophorectomy) was performed without intraoperative complications. Histopathological analysis confirmed clear cell carcinoma of the right ovary with omental and peritoneal dissemination, classified as stage IIIC (pT2aN1M0). Postoperative chemotherapy was planned. The patient developed persistent fever of unknown origin; blood cultures remained negative, suggesting tumor-related fever. On postoperative day 9, she exhibited autonomic instability, severe dysphoria, and epileptic seizures. Electroencephalography (EEG) revealed epileptiform discharges. Limited improvement was achieved with diazepam, fosphenytoin, and levetiracetam. Midazolam and rocuronium administration improved her consciousness, and she required endotracheal intubation and mechanical ventilation. Recurrent generalized convulsions necessitated escalation

of midazolam and high-dose intravenous methylprednisolone pulse therapy. Continuous administration of levetiracetam, lacosamide, perampanel, and fentanyl followed.

EEG demonstrated rhythmic delta activity consistent with non-convulsive status epilepticus. On postoperative day 17, the paraneoplastic antibody panel returned positive, confirming autoimmune encephalitis. On postoperative day 18, while her condition remained critical, the medical team informed the patient and her family of the prognosis and potential for recurrent seizures. A decision was made to withhold deintubation and refrain from further pharmacologic escalation. By postoperative day 32, she developed diffuse subcutaneous hemorrhages over the forearm and anterior chest, and laboratory data suggested paraneoplastic disseminated intravascular coagulation. The patient died 33 days after surgery.

Discussion

Although intracranial metastases account for 50–60% of tumor-associated epilepsies, immunologic mechanisms underlying paraneoplastic syndromes are increasingly recognized [7-9]. Gonadal teratoma, derived from pluripotent germ cells, represents the most common germ cell tumor associated with paraneoplastic encephalitis, particularly anti–N-methyl-D-aspartate (NMDA) receptor encephalitis, where seizures constitute an initial symptom in approximately 70% of cases [10-14]. Severe paraneoplastic encephalitis may result in death or profound neurologic sequelae [15,16]; however, up to 89% of patients improve following appropriate immunotherapy and tumor removal [14]. Patients with ovarian tumors may experience more rapid deterioration, frequently necessitating intensive care due to severe autonomic and consciousness disturbances. Cytoreductive surgery—entailing comprehensive surgical exploration, omentectomy, peritonectomy, and organ resection for peritoneal carcinomatosis—could act as a potential trigger for autoimmune encephalitis. As in our case, postoperative onset of encephalitis raises the possibility that surgical manipulation may facilitate the release of tumor-associated antigens into systemic circulation, provoking autoimmune activation. Although NMDA receptor expression has been documented in ovarian tumor tissues [3], the causal relationship between cytoreductive surgery and the onset of autoimmune encephalitis remains to be fully elucidated.

Given the potential for life-threatening neurological complications, early recognition, prompt immunotherapy, and optimized intensive care are imperative. Clinicians should maintain high clinical suspicion for paraneoplastic encephalitis in postoperative patients with unexplained cognitive dysfunction, epileptic seizures, or altered mental status, particularly following ovarian cancer surgery.

Conflict of Interest

The authors declare that they have no conflict of interest.

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ISSN: 2574-1241

DOI: 10.26717/BJSTR.2025.63.009944

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