CASE REPORT

NUREXUS

Journal of MedVerse Research & Practice

ISSN: 3107-4278

When a Seizure Leads to a Fatal Course: Refractory Status Epilepticus and Polymicrobial Sepsis in a Medicolegal Case

S Vikash Shah[1], H Murthy [2]

Postgraduate, Assistant Professor

Department of Forensic Medicine and Toxicology, Zhejiang University, China

Email ID: vikashshah@gmail.Com

Submission Date: 10.08.2026	Accepted Date:19.09.2026	Published Date: 30.09.2026
DOI: 10.65188/nurexus.1103		

Copyright © 2026. The author(s). Published by *Journal of MedVerse Research and Practice*. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

Abstract

Background: Refractory status epilepticus and polymicrobial sepsis are critical medical emergencies that may lead to progressive multiorgan dysfunction and death. When neurological symptoms occur in association with a suspected traumatic event, establishing the sequence of events and identifying the underlying cause of deterioration can be particularly challenging. Correlation of clinical findings with postmortem pathological observations is essential in such circumstances.

Case Presentation: We report the case of a 44-year-old male who presented with high-grade fever, altered sensorium and neck pain, with a history suggestive of a recent road traffic accident. The initial event occurred when the patient reportedly experienced a seizure while driving, resulting in a collision with stationary vehicles along the roadside. He was subsequently found unconscious, with his body positioned against the steering wheel. Bystanders alerted the police, who initially suspected alcohol intoxication as a possible contributing factor to the accident. A medico-legal case was subsequently registered, and the patient was transported to a nearby healthcare facility for emergency stabilisation. During hospitalisation, his condition was complicated by refractory status epilepticus and polymicrobial sepsis, followed by progressive multiorgan dysfunction. Despite intensive supportive management, including airway stabilisation, tracheostomy and antimicrobial treatment, his clinical condition continued to worsen, ultimately resulting in death. Postmortem examination demonstrated pulmonary oedema, steatohepatitis, acute tubular necrosis and an organising thrombus involving the posterior interventricular artery. These pathological findings reflected extensive systemic involvement and provided additional information for clinicopathological correlation.

Conclusion: This case illustrates the potentially fatal progression of refractory status epilepticus complicated by polymicrobial sepsis and multiorgan dysfunction. It also demonstrates the diagnostic challenges encountered when an acute neurological event presents as a road traffic accident and is initially suspected to be associated with intoxication. Integration of the circumstances surrounding the incident, clinical documentation and postmortem findings is crucial for reconstructing the sequence of events and understanding the terminal disease process. Careful clinicopathological correlation remains particularly valuable when gross postmortem findings are limited and histopathological examination provides important additional evidence.

Keywords: Refractory status epilepticus; Polymicrobial sepsis; Multiorgan dysfunction; Road traffic accident; Forensic pathology; Acute tubular necrosis; Steatohepatitis; Postmortem examination.

Introduction

Status epilepticus (SE) represents a neurological emergency characterised by sustained seizure activity or repeated seizures occurring without restoration of consciousness between episodes. According to the International League Against Epilepsy (ILAE), convulsive seizure activity persisting for five minutes or

longer should be considered status epilepticus and requires immediate therapeutic intervention. Refractory status epilepticus (RSE) is defined by the persistence of seizure activity despite appropriate treatment with a benzodiazepine followed by at least one adequately selected second-line antiseizure medication. This condition is associated with considerable morbidity and mortality, particularly in individuals with concurrent infections, metabolic abnormalities or acute neurological insults [1,2].

Sepsis is a potentially fatal systemic condition arising from an abnormal host response to infection, leading to life-threatening organ dysfunction. The simultaneous occurrence of sepsis and persistent seizure activity can significantly complicate clinical management, resulting in neurological impairment, circulatory instability and progressive multiorgan dysfunction. Inflammatory mediators, metabolic derangements, disturbances in cerebral perfusion and altered neuronal activity may contribute to the development and persistence of seizures. Additionally, sepsis-related dysfunction of vital organs can influence drug metabolism, complicate antiseizure medication administration and adversely affect therapeutic outcomes [3,4]. Managing patients with concurrent neurological deterioration and severe systemic infection requires a comprehensive multidisciplinary approach. Timely identification of the underlying cause, appropriate microbiological investigations, targeted antimicrobial treatment, seizure control and supportive management of organ dysfunction are essential to improving clinical outcomes. In fatal presentations, postmortem examination serves as an important diagnostic tool by identifying pathological alterations in different organ systems and facilitating correlation between clinical progression and anatomical findings.

However, conventional autopsy may not always demonstrate specific structural abnormalities corresponding to severe neurological dysfunction. Since seizure activity primarily involves abnormal electrical discharges within the brain, its underlying functional disturbances may not produce identifiable gross or microscopic pathological changes. Consequently, the absence of significant structural abnormalities does not exclude the occurrence of severe or fatal neurological events. Histopathological assessment, together with clinical documentation and postmortem findings, is therefore essential for a comprehensive interpretation of such cases [5-7].

The present case report describes the clinical course and postmortem pathological findings of a 44-year-old male who developed refractory status epilepticus complicated by polymicrobial sepsis, ultimately progressing to multiorgan dysfunction syndrome and death. This case emphasises the diagnostic complexities associated with overlapping neurological and infectious emergencies and highlights the importance of integrating clinical, microbiological and pathological evidence in understanding fatal clinical outcomes.

Case Report

Patient Profile

A 44-year-old male was admitted to the hospital for further evaluation and management of a complex neurological and infectious condition. During his hospital stay, his clinical course was complicated by refractory status epilepticus, polymicrobial sepsis, septic shock and progressive multiorgan dysfunction syndrome (MODS). Despite prolonged hospitalisation and intensive medical management, the patient eventually succumbed to the complications of his illness.

Clinical Presentation

The patient was employed as a driver and had no documented history of seizures or previously diagnosed seizure disorder. According to information provided by his family members, he had been experiencing high-grade fever associated with chills for approximately one week before the incident. While driving, he reportedly experienced his first seizure episode, following which his vehicle collided with a stationary truck.

Following the accident, the patient was found unconscious at the scene. Bystanders reportedly suspected alcohol intoxication and alerted the police. He was subsequently transported to a nearby hospital by police personnel for emergency medical attention. His family members alleged that he had been subjected to physical assault by police personnel after the incident; however, this allegation could not be independently substantiated by the available clinical documentation or postmortem examination. The incident was registered as a medico-legal case (MLC), necessitating subsequent forensic evaluation.

Following the incident, the patient presented with altered sensorium and neck pain. He initially received treatment with antibiotics and antipyretic medications at an outside healthcare facility. In view of his deteriorating neurological condition, he was referred to the present institution on 21 February 2025 for further investigation and specialised management. During the subsequent hospitalisation, he developed recurrent seizure episodes, and serial electroencephalographic (EEG) examinations demonstrated persistent epileptiform activity. Despite intensive therapeutic interventions, his condition progressively worsened, complicated by refractory status epilepticus, polymicrobial sepsis, septic shock and multiorgan dysfunction. He ultimately died on 24 March 2025.

Hospital Course

During the hospital stay, the patient experienced recurrent episodes of seizure activity, with serial EEG recordings demonstrating persistent abnormal electrical activity. The seizures remained uncontrolled despite medical intervention, fulfilling the clinical picture of refractory status epilepticus. Owing to prolonged critical illness and the requirement for sustained airway support, tracheostomy was performed following persistent bleeding through the endotracheal tube.

Microbiological investigations revealed the growth of *Enterobacter* and *Providencia* species in endotracheal aspirate cultures. Urine culture yielded *Candida tropicalis*, while blood cultures obtained from the left femoral site demonstrated *Acinetobacter* species and coagulase-negative *Staphylococcus*. These findings indicated the presence of multiple microbial isolates during the patient's complicated hospital course.

Despite intensive supportive treatment, including antimicrobial therapy, airway management and other critical care interventions, the patient's clinical status continued to deteriorate. Progressive systemic infection, persistent neurological dysfunction and circulatory compromise ultimately resulted in septic shock and multiorgan dysfunction syndrome, leading to his death on 24 March 2025.

Postmortem Findings

External Examination

External examination revealed a surgically created wound measuring 3 × 2 cm over the anterior aspect of the neck, approximately 5 cm above the suprasternal notch. The wound extended to the depth of the trachea and was consistent with the tracheostomy procedure performed during the hospitalisation.

Internal Examination

Examination of the thoracic and abdominal cavities revealed approximately 1.5 litres of straw-coloured fluid within the peritoneal cavity. The heart demonstrated two pale areas measuring 1 × 1 cm and 1 × 0.5 cm over the anterior and posterior surfaces of the left ventricle, respectively. The coronary arteries showed marked narrowing, with their luminal calibre reduced to approximately pinhead size. Calcification of the cardiac valves and atheromatous plaques involving the aortic root were also observed. Both lungs appeared congested on examination. The stomach contained approximately 100 ml of brownish fluid without any characteristic odour, while the gastric mucosa appeared grossly unremarkable. The liver, spleen and kidneys did not demonstrate any obvious gross pathological abnormalities on cut-section examination. Similarly, the brain showed no appreciable gross abnormality on examination of its external surface and cut sections.

Histopathological Findings

Histopathological examination revealed pulmonary edema and congestion in both lungs, indicating significant pulmonary involvement. The liver showed features of steatohepatitis, while the kidneys demonstrated acute tubular necrosis, suggesting renal tubular injury. Examination of the heart revealed an organizing thrombus in the posterior interventricular artery. These findings provided additional pathological evidence of organ involvement in the context of the patient's prolonged critical illness and multiorgan dysfunction.

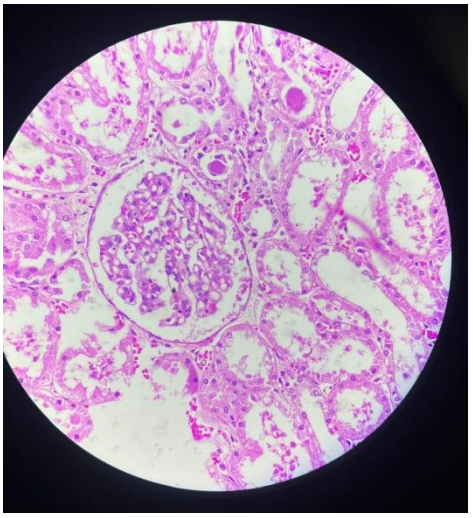


Figure 1: Pictomicrograph of kidney @ 20x power resolution showing diffuse flattening and loss of tubular epithelial cells along the basement membrane suggestive of acute tubular necrosis

Cause of Death

Based on the reported clinical course and final diagnosis, the cause of death was attributed to refractory status epilepticus associated with septic shock, polymicrobial sepsis, and multiorgan dysfunction syndrome. The combination of persistent neurological deterioration and severe systemic infection contributed to the fatal outcome despite intensive medical management.

Discussion

Refractory status epilepticus (RSE) is a life-threatening neurological emergency associated with considerable morbidity and mortality, particularly when accompanied by systemic infections and multiorgan dysfunction syndrome (MODS). In the present case, a 38-year-old male presented with high-grade fever, chills, altered sensorium, and neck pain, followed by persistent seizure activity. The preceding febrile illness raises the possibility of an infectious or inflammatory precipitant. However, in the absence of definitive cerebrospinal fluid findings or other confirmatory investigations, the underlying etiology of RSE could not be established. Early recognition and prompt management of the precipitating cause are essential components of the treatment of status epilepticus [8,9].

Microbiological investigations revealed *Enterobacter* and *Providencia* species in endotracheal aspirate cultures, *Candida tropicalis* in urine, and *Acinetobacter* species and coagulase-negative *Staphylococcus* in blood cultures. These findings demonstrate the isolation of multiple microorganisms from different clinical specimens. Nevertheless, the clinical significance of individual isolates should be interpreted cautiously, considering the specimen source, collection quality, clinical features, and antimicrobial susceptibility profile. Critically ill patients requiring prolonged intensive care and invasive medical devices are particularly vulnerable to healthcare-associated infections [10,11]. Sepsis is defined as life-threatening organ dysfunction resulting from a dysregulated host response to infection and may progress to septic shock and multiorgan failure [10]. In this case, the microbiological findings, together with the progressive clinical deterioration, suggest a possible contribution of systemic infection to the patient's critical condition.

Despite intensive antimicrobial therapy, airway management, and supportive treatment, the patient's condition continued to deteriorate. Persistent seizure activity, together with severe systemic illness, may have contributed to the adverse clinical outcome. The management of RSE requires timely escalation of antiseizure medications, continuous electroencephalographic monitoring when indicated, and a systematic search for potentially reversible causes [12,13]. International consensus recommendations for new-onset refractory status epilepticus (NORSE) also emphasize early diagnostic evaluation and targeted treatment of infectious, autoimmune, inflammatory, and other possible etiologies [14]. In the present case, the available clinical information was insufficient to determine whether the seizures were directly associated with central nervous system infection, systemic inflammation, metabolic disturbances, or another neurological process.

Postmortem histopathological examination revealed pulmonary oedema and congestion, steatohepatitis, acute tubular necrosis, and an organizing thrombus in the posterior interventricular artery. Pulmonary oedema and congestion are compatible with significant pulmonary involvement during critical illness, while acute tubular necrosis indicates renal tubular injury that may occur in association with sepsis, impaired tissue perfusion, or other systemic insults [15]. Neurological dysfunction in severe systemic infection may also be influenced by sepsis-associated encephalopathy, which involves inflammatory, endothelial, and microcirculatory disturbances [16,17]. However, the available findings do not independently establish sepsis-associated encephalopathy in this patient. The organizing coronary arterial thrombus and marked coronary narrowing identified during postmortem examination represent additional cardiovascular abnormalities. Nevertheless, their contribution to the terminal event cannot be conclusively determined without further clinicopathological correlation.

The medico-legal circumstances surrounding this case add further significance to its presentation. The patient reportedly experienced his first seizure while driving, resulting in a road traffic incident and subsequent medico-legal investigation. The absence of a previous seizure history, together with progressive neurological deterioration during hospitalization, highlights the importance of a comprehensive evaluation of new-onset seizure activity. Although the family reportedly raised concerns regarding possible physical assault following the incident, this allegation could not be independently established from the available clinical and postmortem findings. In such circumstances, careful documentation and correlation of the clinical history, EEG findings, biochemical investigations, microbiological results, and autopsy findings are essential for an objective interpretation of the events.

This case also demonstrates the limitations of conventional postmortem examination in explaining severe neurological dysfunction. Although no apparent gross structural abnormality was identified in the brain, the patient had persistent seizure activity and an ultimately fatal clinical course. Seizures arise from abnormal neuronal electrical activity and may occur without distinctive structural changes detectable during routine gross autopsy. However, the absence of gross cerebral abnormalities does not exclude microscopic pathology or establish a specific underlying biochemical mechanism. The findings emphasize the importance of integrating clinical, electroencephalographic, biochemical, microbiological, and histopathological evidence when investigating fatal neurological emergencies, particularly those complicated by systemic infection and multiorgan dysfunction.

Summary

This case highlights the fatal course of refractory status epilepticus complicated by polymicrobial infection, sepsis, and multiorgan dysfunction. Despite intensive treatment, the patient's condition progressively deteriorated. Postmortem examination revealed pulmonary oedema, steatohepatitis, acute tubular necrosis, and coronary arterial abnormalities. The absence of gross cerebral abnormalities emphasizes the limitations

of routine autopsy in explaining neurological dysfunction. This case underlines the importance of early identification of the underlying cause of new-onset seizures and comprehensive clinicopathological correlation in medico-legal investigations.

Conclusion

This case emphasizes the clinical complexity and fatal consequences of refractory status epilepticus complicated by systemic infection and multiorgan dysfunction. It highlights the importance of early diagnosis, prompt management of the underlying cause, and appropriate intensive care support. The absence of significant gross cerebral abnormalities despite persistent seizures also demonstrates the limitations of routine postmortem examination. Comprehensive clinicopathological correlation is essential to establish the possible mechanisms of deterioration and provide a reliable interpretation in medico-legal cases.

Declaration

Consent: Written informed consent was obtained from the patient's legally authorized representative. All identifying information has been kept confidential.

Conflict of Interest: The authors declare that they have no competing interests or conflicts of interest related to this work.

Funding: Nil

Reference

1. Rossetti AO, Claassen J, Gaspard N. Status epilepticus in the ICU. Intensive Care Med. 2024;50(1):1-16. doi:10.1007/s00134-023-07263-w.
2. Coppler PJ, Elmer J. Status epilepticus: a neurologic emergency. Crit Care Clin. 2023;39(1):87-102. doi:10.1016/j.ccc.2022.07.006.
3. Rosenthal ES. Seizures, status epilepticus, and continuous EEG in the intensive care unit. Continuum (Minneap Minn). 2021;27(5):1321-1343. doi:10.1212/CON.0000000000001012.
4. Besha A, Adamu Y, Mulugeta H, Zemedkun A, Destaw B. Evidence-based guideline on management of status epilepticus in adult intensive care unit in resource-limited settings: a review article. Ann Med Surg (Lond). 2023;85(6):2714-2720. doi:10.1097/MS9.0000000000000625.
5. Wickstrom R, Taraschenko O, Dilena R, Payne ET, Specchio N, Nabbout R, et al. International consensus recommendations for management of new-onset refractory status epilepticus (NORSE) including febrile infection-related epilepsy syndrome (FIRES): summary and clinical tools. Epilepsia. 2022;63(11):2827-2839. doi:10.1111/epi.17391.
6. Wickstrom R, Taraschenko O, Dilena R, Payne ET, Specchio N, Nabbout R, et al. International consensus recommendations for management of new-onset refractory status epilepticus including febrile infection-related epilepsy syndrome: statements and supporting evidence. Epilepsia. 2022;63(11):2840-2864. doi:10.1111/epi.17397.
7. Tharmaraja T, Neligan A. The etiology and mortality of new-onset refractory status epilepticus (NORSE) in adults: a systematic review and meta-analysis. Epilepsia. 2023;64(5):1113-1124. doi:10.1111/epi.17523.
8. Evans L, Rhodes A, Alhazzani W, Antonelli M, Coopersmith CM, French C, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. Intensive Care Med. 2021;47(11):1181-1247. doi:10.1007/s00134-021-06506-y.
9. Egi M, Ogura H, Yatabe T, et al. The Japanese Clinical Practice Guidelines for Management of Sepsis and Septic Shock 2020 (J-SSCG 2020). J Intensive Care. 2021;9:53. doi:10.1186/s40560-021-00555-7.
10. Tabah A, et al. Use of antimicrobials for bloodstream infections in the intensive care unit: a clinically oriented review. Antibiotics (Basel). 2022;11(3):362. doi:10.3390/antibiotics11030362.
11. World Health Organization. Global report on infection prevention and control. Geneva: World Health Organization; 2022.
12. Sonneville R, Benghanem S, Jeantin L, de Montmollin E, Doman M, Gaudemer A, et al. The spectrum of

sepsis-associated encephalopathy: a clinical perspective. Crit Care. 2023;27:386. doi:10.1186/s13054-023-04655-8.
13. Hong Y, Chen P, Gao J, Lin Y, Chen L, Shang X. Sepsis-associated encephalopathy: from pathophysiology to clinical management. Int Immunopharmacol. 2023;124(Pt A):110800. doi:10.1016/j.intimp.2023.110800.
14. Alkhachroum A, et al. Electroencephalogram in the intensive care unit: a focused look at acute brain injury. Intensive Care Med. 2022;48(10):1443-1462.
15. Birkelo BC, et al. Overview of diagnostic criteria and epidemiology of acute kidney injury and acute kidney disease in the critically ill patient. Clin J Am Soc Nephrol. 2022;17(5):717-735.
16. Jamme M, et al. Outcome of acute kidney injury: how to make a difference? Ann Intensive Care. 2021;11:60.
17. Evans L, Rhodes A, Alhazzani W, et al. Executive summary: Surviving Sepsis Campaign: international guidelines for the management of sepsis and septic shock 2021. Crit Care Med. 2021;49(11):1974-1982. doi:10.1097/CCM.0000000000005357.