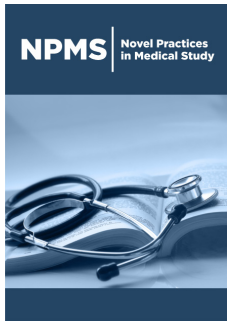


# Delayed ICANS in Post BCMA CAR-T Cell Therapy Challenges

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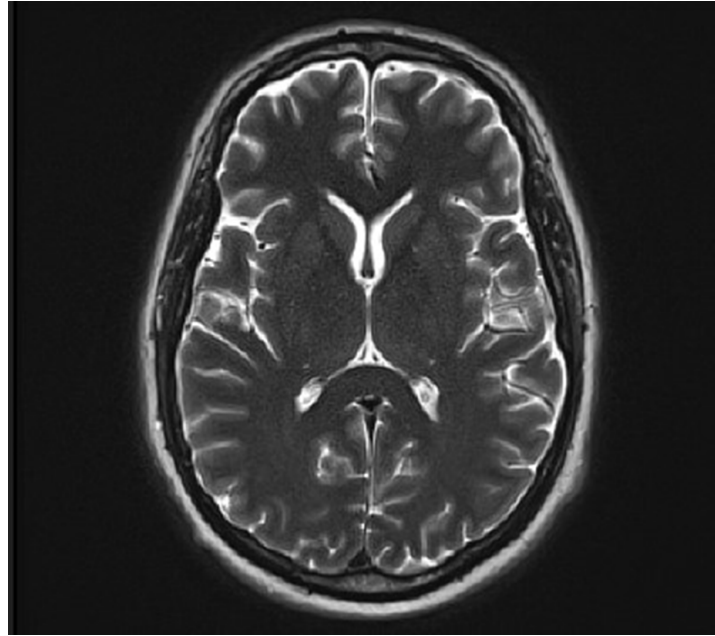
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## Introduction

Multiple Myeloma is a hematological malignancy that has been difficult to cure despite many available lines of therapies. New modalities like Chimeric Antigen Receptor modified T (CAR-T) cell therapy have given chance for Relapsed Refractory Multiple myeloma to get stringent responses and possibilities of long-term disease control. This modality is associated with specific toxicities like Cytokines Release Syndrome (CRS) and Immune effector Cell associated Neurological Syndrome (ICANS) and long-term side effects such as delayed cytopenia and neurological sequel. In this abstract we discuss a case of Multiple Myeloma who developed delayed ICANS. 37-year male presented with lytic lesions in the spine and ribs in September 2017 and work up confirmed diagnosis of multiple myeloma low risk as per International Staging System ISS-1. He received Bortezomib lenalidomide Dexamethasone four cycles, followed by Autologous Stem cell transplantation in April 2018 and maintenance lenalidomide. In December 2019, he relapsed with an extra-axial soft tissue disease treated with additional lines of treatment including radiotherapy, daratumumab, pomalidomide, and carfilzomib in various combination with steroids. He ultimately had CAR-T cell therapy in April 2023.

After CAR-T infusion he suffered adverse effects CRS grade 3 and ICANS grade 3, requiring ICU hospitalization and treatment with Tocilizumab and steroids he had long ICU hospitalization but discharged home on two antiepileptic agents (Phenobarbital and Levetiracetam). Day 90 assessment displayed stringent Complete Remission (sCR) with no evidence of biochemical markers and a negative PET (Positron Emission Tomography). He remained cytopenic post CAR-T cell therapy and required transfusion and growth factor support, IVIG and prophylaxis antimicrobial. He was able to return home to continue follow close at home in SEP 2023 and was weaned off all his seizure medication by that time and off steroids as well. 6 months post his CAR-T cell therapy he was admitted to ICU (Intensive Care Unit) with episode of seizure and post ictal confusion required intubation due to difficult protecting airway.

Every investigation into viral markers was negative. Myeloma screening was negative. MRI of the brain indicated Pan-meningitis (Figure 1). No abnormal cells in the CSF, high protein level and normal glucose levels. Generalized periodic epileptiform activity was seen on the EEG. He was treated for delayed ICANS grade 4 with steroids and antiseizure medications (Phenytoin and Levetiracetam). He clinically improved and was discharged with a prescription for steroids, phenytoin, and Levetiracetam and followed up in clinic. Unfortunately, he suffered another seizure at home unwitnessed and admitted to ICU, he was found to have septic shock with streptococcal pneumonia and passed away from septic shock.



**Figure 1:** MRI of the brain indicated Pan-meningitis.

### Conclusion

In conclusion CAR T cell therapy can put patients with Relapsed Refractory Myeloma into deep remission but is associated with both acute and late complications. Late complications like Movement

and Neurocognitive Toxicities (MNT) and Delayed ICANS are part of this but also cytopenia and infection is another. High index of suspicion and close follow up is important for better support and adequate management for such patients.