



## ACUTE HAEMORRHAGIC ENCEPHALITIS IN RABIES: AN ATYPICAL MRI PRESENTATION

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### ABSTRACT

Rabies encephalitis is a rapidly fatal viral infection affecting the central nervous system, typically presenting with altered sensorium, autonomic dysfunction, and progressive coma. MRI plays a crucial role in diagnosis, often revealing T2 hyperintensities in the brainstem, basal ganglia, and limbic system. In this case, an intubated ICU patient with rabies encephalitis exhibited T2 hyperintensities involving the bilateral cortex, basal ganglia (caudate, globus pallidus, putamen), and parts of the thalami, with diffusion restriction and hemorrhagic foci on SWI, suggestive of acute hemorrhagic encephalitis. These findings highlight an uncommon radiological manifestation of rabies, which can mimic other viral or autoimmune encephalitides. Early recognition of such atypical imaging features is crucial for timely diagnosis and management in endemic regions.

### INTRODUCTION

Rabies is a neurotropic viral disease with nearly 100% mortality once clinical symptoms appear. MRI findings typically include T2 hyperintensities in the brainstem, basal ganglia, and limbic system, but hemorrhagic changes are rare. This case presents **acute hemorrhagic encephalitis** as a distinct radiological feature of rabies encephalitis.

### Case Presentation

**Clinical History:** A 63 year-old female was admitted to the ICU with fever, agitation, altered sensorium. The

patient was intubated for airway protection. Family history later revealed a **possible animal exposure (stray dog bite)**.

**MRI Findings:** B/l symmetrical T2/FLAIR hyperintensities seen in basal ganglia and thalami with multiple foci of blooming in b/l basal ganglia. No diffusion restriction and post contrast enhancement seen.

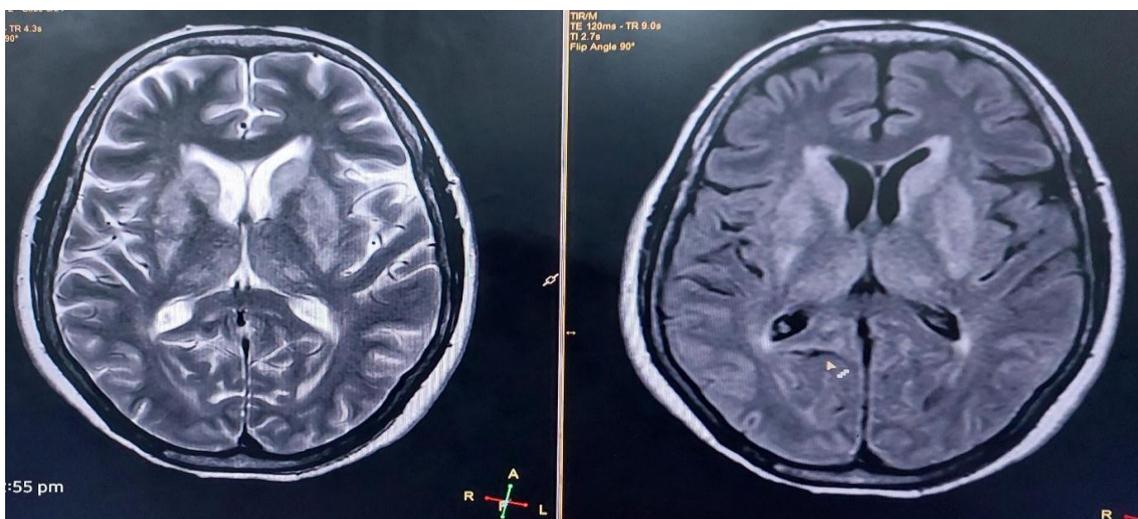


Figure 1: Axial T2/FLAIR MRI images showing hyperintensities with in b/l basal ganglia, thalami.

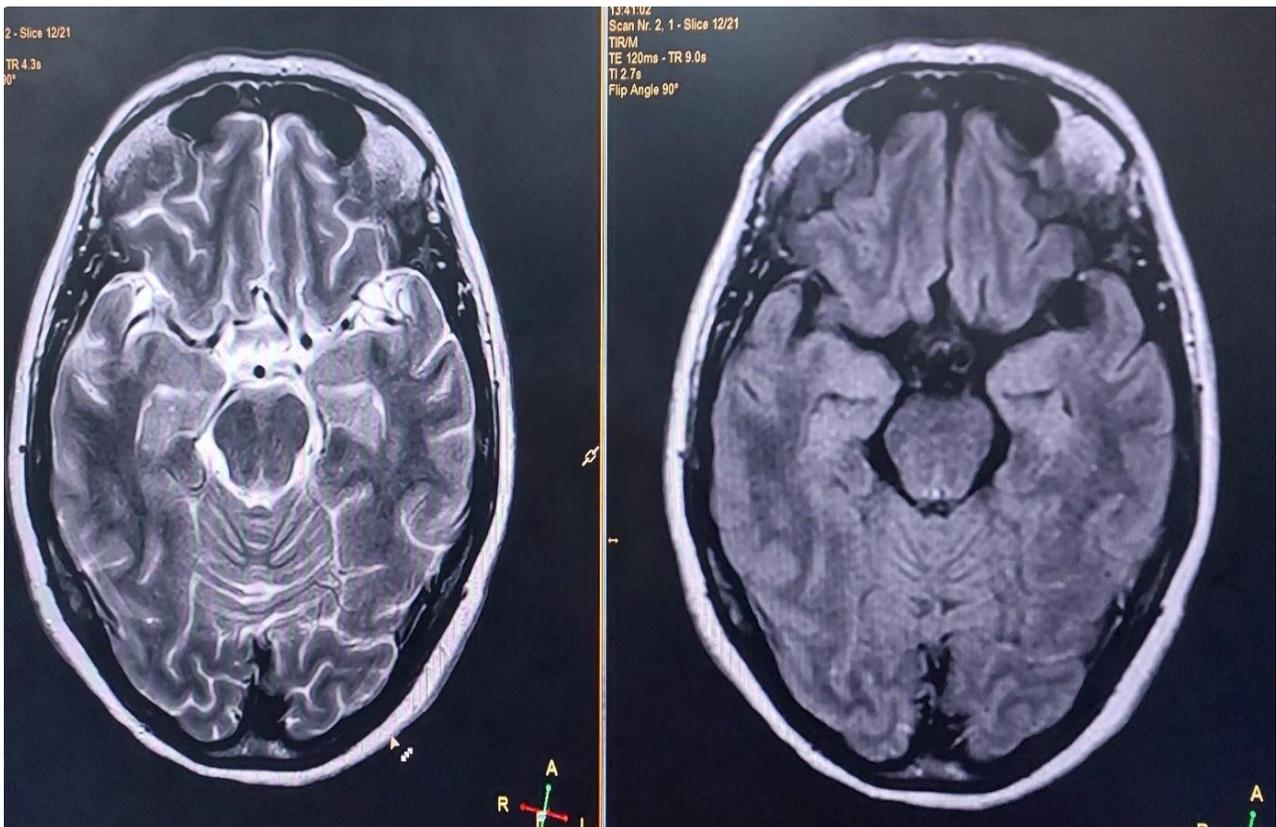


Figure 2: Axial T2/FLAIR MRI images showing hyperintensities with in b/l medial temporal lobe.

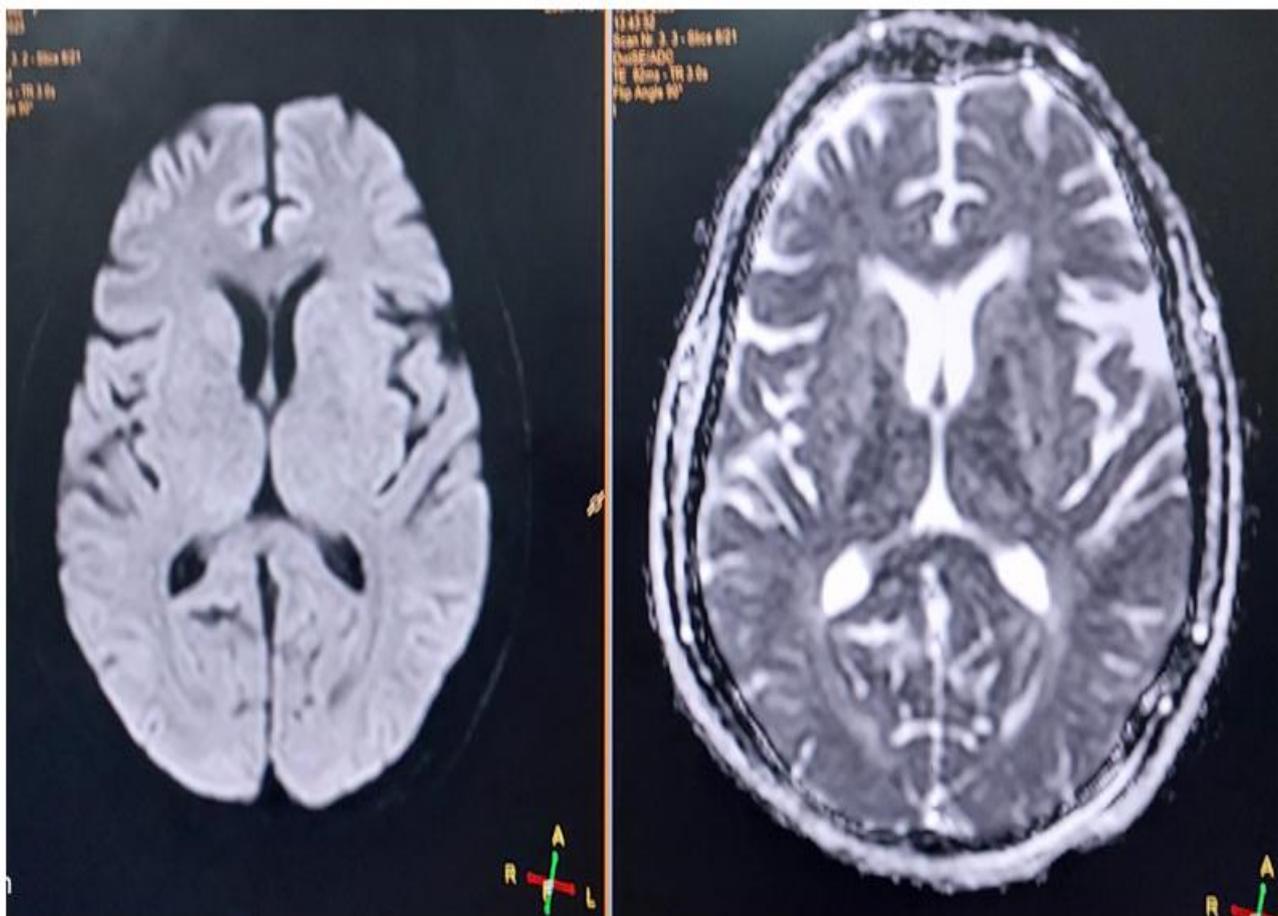


Figure 3: Axial DWI and ADC images showing no diffusion restriction within the b/l basal ganglia, thalami.



Figure 4: Axial SWI MRI images showing blooming foci within the b/l basal ganglia s/o Microhaemorrhages.

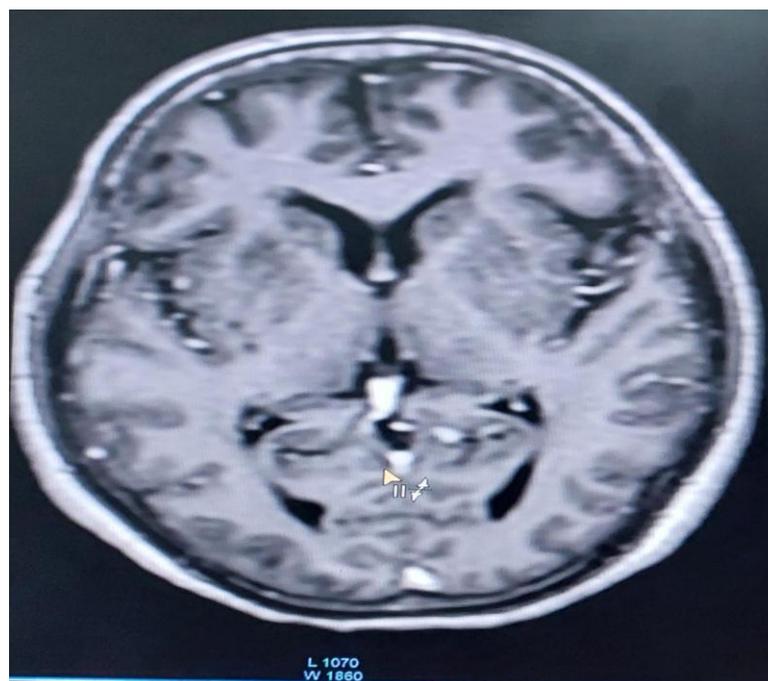


Figure 5: Axial T1 post contrast MRI image showing no abnormal contrast enhancement within the b/l basal ganglia, thalami.

### Diagnosis & Outcome

- **CSF analysis showed lymphocytic pleocytosis, elevated protein, and normal glucose.**
- **RT-PCR for rabies virus was positive.**
- The patient remained in critical condition and later succumbed to the illness.

### DISCUSSION

Rabies encephalitis is a devastating central nervous system infection caused by the rabies virus, primarily transmitted through animal bites, notably from dogs and bats.<sup>[1]</sup> The disease is almost universally fatal once clinical symptoms manifest, underscoring the importance of early diagnosis and intervention.

**Imaging Characteristics:** MRI is the imaging modality of choice for rabies encephalitis due to its superior sensitivity in detecting parenchymal changes. Typical MRI findings include:

- **T2/FLAIR Hyperintensities:** Predominantly observed in the brainstem, basal ganglia, thalami, and limbic system.<sup>[1]</sup>
- **Diffusion Restriction:** Areas showing hyperintensity on DWI with corresponding low ADC values, indicating cytotoxic edema.<sup>[2]</sup>
- **Hemorrhagic Foci:** Although uncommon, susceptibility-weighted imaging (SWI) can detect microhemorrhages, as seen in this case.<sup>[3]</sup>  
The presence of hemorrhagic lesions, particularly in the basal ganglia and thalami, is atypical for rabies encephalitis and can lead to diagnostic dilemmas.

**Differential Diagnosis:** The MRI findings in this case necessitate differentiation from other encephalitic processes.

- **Herpes Simplex Encephalitis (HSE):** Typically involves the medial temporal lobes and insular cortex, often sparing the basal ganglia.<sup>[4]</sup>
- **Japanese Encephalitis:** Characterized by thalamic involvement but usually presents with asymmetric lesions and lacks significant hemorrhagic components.<sup>[5]</sup>
- **Hemorrhagic Viral Encephalitis (e.g., Dengue):** May present with hemorrhagic lesions but is often accompanied by systemic manifestations like rash and thrombocytopenia.<sup>[6]</sup>

**Pathophysiology of Hemorrhagic Manifestations:** The hemorrhagic component observed in this case may be attributed to several factors.

- **Viral-Induced Vasculopathy:** Direct invasion of endothelial cells by the rabies virus can lead to vascular inflammation and subsequent hemorrhage.
- **Immune-Mediated Damage:** The host's immune response may cause a breakdown of the blood-brain barrier, resulting in petechial hemorrhages.  
Understanding these mechanisms is crucial for developing targeted therapeutic strategies and improving patient outcomes.

### CONCLUSION

This case report highlights **acute hemorrhagic encephalitis** as a rare radiological presentation of rabies. Recognizing **hemorrhagic foci within the basal ganglia and thalami on MRI** can aid in early diagnosis, differentiating it from other viral encephalitides.

### REFERENCES

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