Making History with Histiocytes: An Uncommon Presentation of Erdheim Chester Disease

Faizan Azim[1], Suzanne Powell[2], Ethan Burns[3]

1. Department of Academic Medicine, Houston Methodist Hospital
2. Department of Pathology, Houston Methodist Hospital
3. Houston Methodist Neal Cancer Center, Houston Methodist Hospital

Introduction

- Erdheim Chester Disease (ECD) is a rare neoplastic disease with only approximately 1000 reported cases worldwide
- It is classified as a histiocytic inflammatory neoplasm with diverse clinical manifestations that reflect its ability to involve multiple organ systems
- Overlap with other histiocytic diseases, lymphomas, and granulomatous diseases leads to diagnostic and treatment delays.

Case Presentation

A 41-year-old male presented with 4 months of progressive neurological symptoms, including headaches, slurred speech, and gait instability. He was initially evaluated in the outpatient setting, where a CT head was ordered and he was prescribed a short course of oral steroids, resulting in transient symptom improvement.

He subsequently experienced acute clinical deterioration, developing dysphagia and new right-sided weakness, prompting presentation to the emergency department.

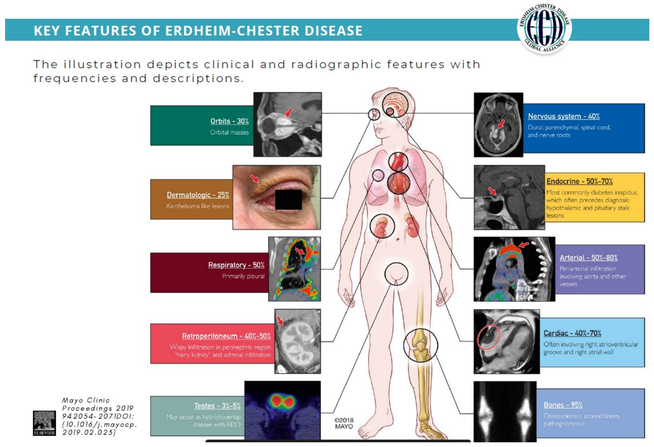
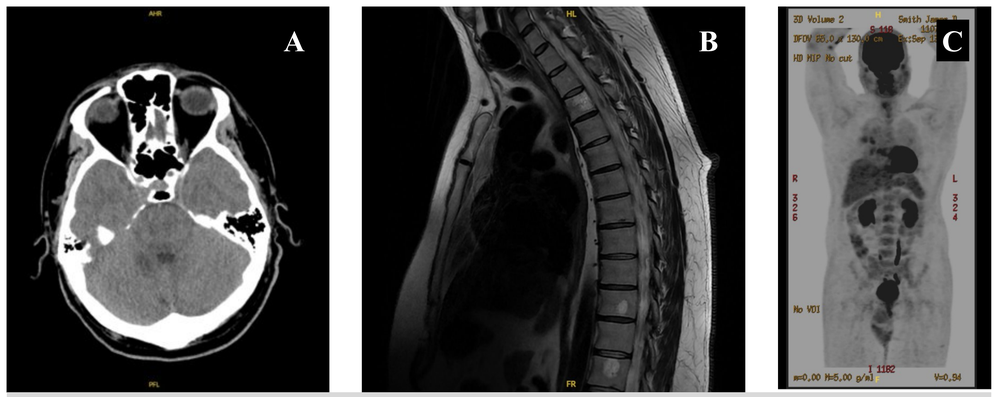
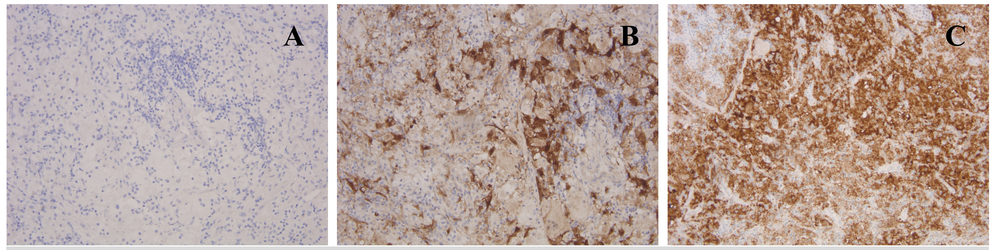


Figure 1. This infographic demonstrates the multisystem involvement of ECD

Radiographic and Histopathologic Findings



Figures 2,-4. Multimodal imaging demonstrating multisystem involvement. (A) Non-contrast CT Head showing posterior fossa lesion. (B) MRI spine demonstrating osseous involvement (C) PET/CT with hypermetabolic systemic disease



Figures 4 - 6. Immunohistochemistry showing (A) CD1a negativity, (B) Factor XIIIa positivity, and (C) BRAF V600E positivity, supporting diagnosis of ECD.

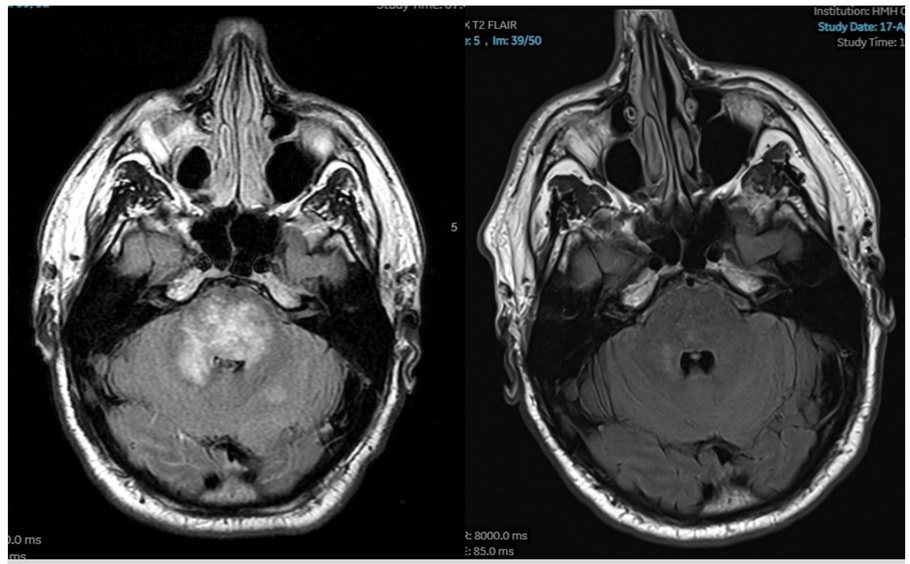


Figure 7 and 8. Axial T2 FLAIR MRI demonstrating posterior fossa lesion pre-treatment (left) and post-treatment (right)

Diagnostic Workup

- **CT Head:** Heterogeneously hypodense process/mass expanding the pons extending to pontomedullary junction
- **MRI Brain:** Infiltrative mass within posterior fossa, most prominently involving the pons
- **MRI Thoracic Spine:** Multiple T2 hyperintense lesions throughout thoracic cord
- **PET/CT:** Marked hypermetabolism in area of CNS mass, mostly centered in the pons
- **Lumbar Puncture:** No evidence of lymphoma or malignant cells

Treatment and Outcome

- Initiated on BRAF-targeted therapy (Vemurafenib) following identification of BRAF V600E mutation
- Demonstrated significant clinical and radiographic response on interval MRI and PET imaging
- Concurrent BRAF V600E-mutated melanoma was identified, excised, and has not recurred

Diagnostic Challenges and Management Considerations

- While BRAF-targeted therapy (Vemurafenib) resulted in marked clinical and radiographic improvement, the optimal duration of therapy remains unclear due to limited long-term data
- ECD is associated with secondary malignancies and endocrinopathies, as seen in this case, requiring multidisciplinary follow-up
- Proper use of immunophenotypic markers (e.g., Factor XIIIa, CD1a) is essential to differentiate ECD from Langerhans Cell Histiocytosis

Key Takeaway

- ECD requires a multimodal diagnosis, and BRAF-targeted therapy can lead to dramatic clinical and radiographic response

References

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