# Multicentric Giant Cell Glioblastoma: A Potential Diagnostic Challenge

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## Background

- Giant cell glioblastoma is a very rare subtype of glioblastoma multiforme, comprising approximately 5% of all glioblastomas.
- Categorized as WHO grade IV, this glioblastoma variant usually affects younger patients and is thought to have a better prognosis than the classic type.
- The presence of multiple glioblastoma lesions in more than one location without direct connection between the lesions, known as multicentric disease, is even rarer still, and has significant prognostic and therapeutic implications.
- We report a case of multicentric giant cell glioblastoma with numerous lesions, which radiologically mimicked metastasis.

## Clinical Summary

- 69 year old white male with history of tobacco and alcohol abuse.
- Presented with gradually worsening memory loss, cognitive decline, and behavioral disturbances.
- MRI of the brain revealed multiple discrete, non-hemorrhagic lesions within the subcortical white matter and grey-white junction, involving the bilateral frontal lobes, left occipital lobe, and right insular cortex, which displayed varying degrees of peripheral rim enhancement, suspicious for metastasis (Fig. 1).
- An extensive work-up found no infectious or inflammatory etiology, and CT chest, abdomen, and pelvis were negative for malignancy.

## Results

- A brain biopsy was performed of the left frontal lobe lesion.
- Showed a highly cellular and pleomorphic glial neoplasm with numerous bizarre and multinucleated cells, vascular proliferation, necrosis, and infiltration of adjacent white matter (Fig. 2-5).
- Positive for GFAP and P53 by immunohistochemistry; Ki-67 proliferation index was relatively low at 3-4% (Fig. 6).
- Signed out as glioblastoma multiforme, giant cell type, WHO grade IV.

## Conclusion

- The diagnosis of giant cell glioblastoma is challenging, with two major diagnostic pitfalls which must be recognized and avoided.
- First, due to its often well-circumscribed nature and subcortical location, this tumor may appear as metastasis on imaging.
- This problem is further compounded in the context of multiple lesions, as seen in multicentric disease.
- In addition, the histologic features of giant cell glioblastoma may overlap in some cases with epithelioid glioblastoma and be mistaken for metastatic carcinoma or melanoma, particularly with suspicious imaging.
- In summation, we report a very rare case of multicentric giant cell glioblastoma mimicking metastasis, which highlights important radiologic and pathologic diagnostic pitfalls.

## Figures

- Figure 1. MRI with contrast, coronal sections showing multiple discrete lesions with variable rim enhancement (arrows).
- Figure 2. Touch prep of the left frontal lobe lesion shows hypercellularity (H&E, 100X).
- Figure 3. Highly cellular and pleomorphic glial neoplasm with numerous bizarre and multinucleated cells (H&E, 100X).
- Figure 4. Higher power highlights pleomorphism and multinucleated giant cells (H&E, 200X).
- Figure 5. CD34 immunohistochemistry highlights vascular proliferation (arrow) (100X).
- Figure 6. Neoplastic cells are positive by immunohistochemistry for A: GFAP, and B: P53 (100X).

## References