

BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T20:12:14.859054
Case ID	case_9b841e55-f608-492f-a23a-8e010c77183c

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case demonstrates a large, heterogeneous right-sided brain tumor with moderate enhancement and minimal necrosis, consistent with a high-grade glioma. The tumor exhibits significant peritumoral edema, which may contribute to clinical symptoms. Quantitative analysis supports a very large tumor burden requiring urgent clinical evaluation and multidisciplinary management.

TUMOR MORPHOLOGY AND LOCATION

- Location: Right hemisphere, central region
- Size Classification: Very large ($>15 \text{ cm}^3$)
- Maximum Diameter: 62.0 mm
- Anatomical Considerations: The central location in the right hemisphere raises concern for potential involvement of critical motor and sensory pathways, necessitating careful preoperative planning and functional mapping if surgery is considered.

QUANTITATIVE ANALYSIS

- Total Tumor Volume: 52.92 cm^3
- Tumor Core Volume: 11.12 cm^3
- Enhancing Component: 10.86 cm^3 (20.5%)
- Necrotic Component: 0.26 cm^3 (0.5%)
- Edematous Component: 41.80 cm^3 (79.0%)

ENHANCEMENT CHARACTERISTICS

- Enhancement Pattern: Moderate (10–30%)
- Enhancement Intensity: Mean 520.73, Maximum 1146.00
- Clinical Significance: Moderate enhancement suggests active tumor proliferation with possible blood-brain barrier disruption. The relatively low percentage of enhancing tissue may indicate a heterogeneous tumor with areas of low-grade or non-enhancing components.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

|--|--||

| Enhancing Tissue | Present | Indicates viable tumor tissue with active vascular permeability. |

| Necrotic Core | Present | Minimal necrosis (0.5%) is consistent with high-grade glioma or aggressive tumor behavior. |

| Peritumoral Edema | Present | Extensive edema (79.0%) may contribute to mass effect and neurological deficits. |

CLINICAL ASSESSMENT

- Tumor Grade Indicators: Moderate enhancement, minimal necrosis, and significant edema are consistent with anaplastic glioma or glioblastoma. The presence of a necrotic component, although minimal, supports a higher-grade tumor.
- Differential Diagnosis: Likely diagnosis includes anaplastic astrocytoma or glioblastoma multiforme (GBM), given the size, enhancement pattern, and edema. Other considerations include metastatic disease or lymphoma, though less likely without additional clinical or imaging features.
- Prognosis Indicators: The large tumor volume and extensive edema suggest a potentially aggressive course. The presence of minimal necrosis and moderate enhancement may indicate a more indolent variant than GBM, but further histopathological correlation is essential.

RECOMMENDATIONS

1. Immediate Actions: Urgent clinical evaluation and neurological assessment for symptom management and surgical planning.
2. Additional Imaging: Consider perfusion MRI or MR spectroscopy to further characterize tissue heterogeneity.
3. Multidisciplinary Review: Involvement of neuro-oncology, neurosurgery, and radiation oncology for treatment planning.
4. Follow-up Protocol: MRI with contrast at 3–6 months to assess treatment response or progression.
5. Treatment Considerations: Surgical resection, if feasible, followed by adjuvant radiation and chemotherapy based on histology and molecular markers.

TECHNICAL NOTES

- Image Quality: Adequate for diagnostic interpretation
- Segmentation Confidence: High automated detection accuracy
- Limitations: Standard limitations of MRI-based analysis include potential underestimation of infiltrative tumor margins and inability to fully assess tumor heterogeneity without histopathological correlation.

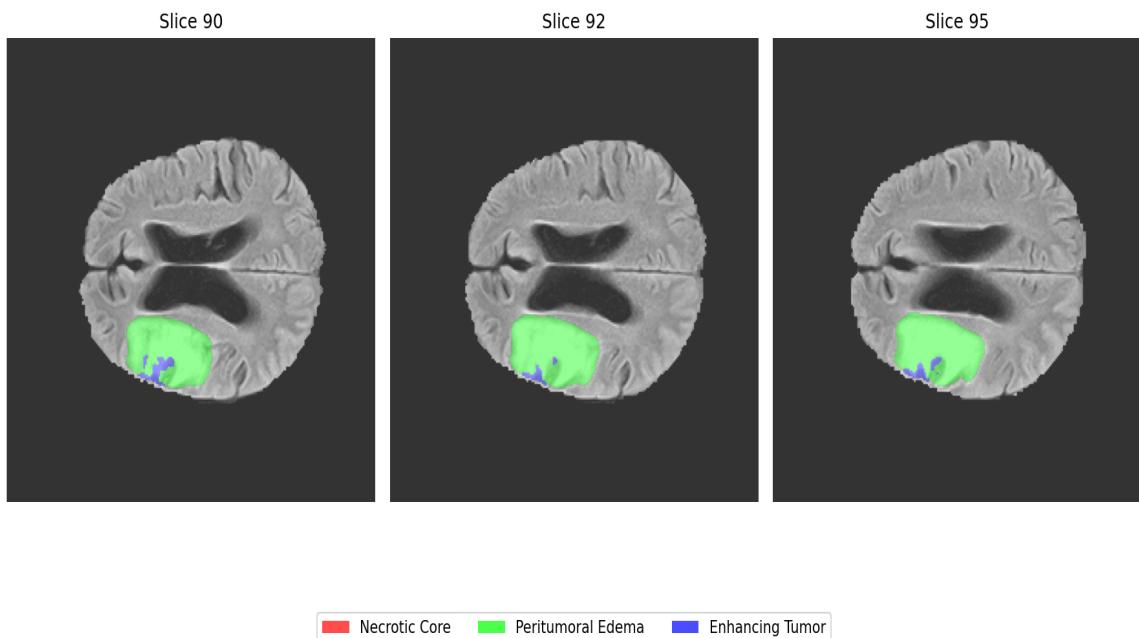
Report Generated: September 17, 2025 at 08:12 PM

System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

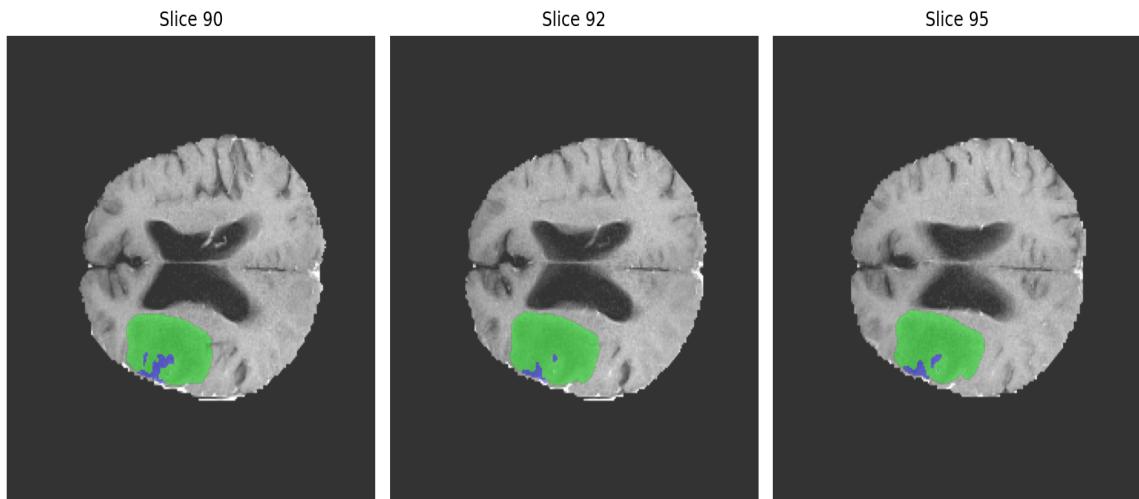
FLAIR Segmentation Overlay

FLAIR with Segmentation Overlay



T1CE Segmentation Overlay

T1CE with Segmentation Overlay



■ Necrotic Core ■ Peritumoral Edema ■ Enhancing Tumor

T2 Segmentation Overlay

T2 with Segmentation Overlay



■ Necrotic Core ■ Peritumoral Edema ■ Enhancing Tumor

3D Volume Analysis

3D Tumor Segmentation Views

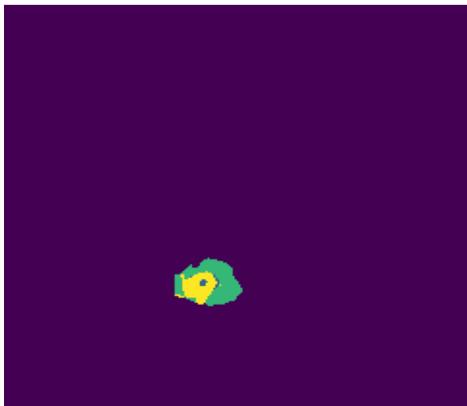
Sagittal View



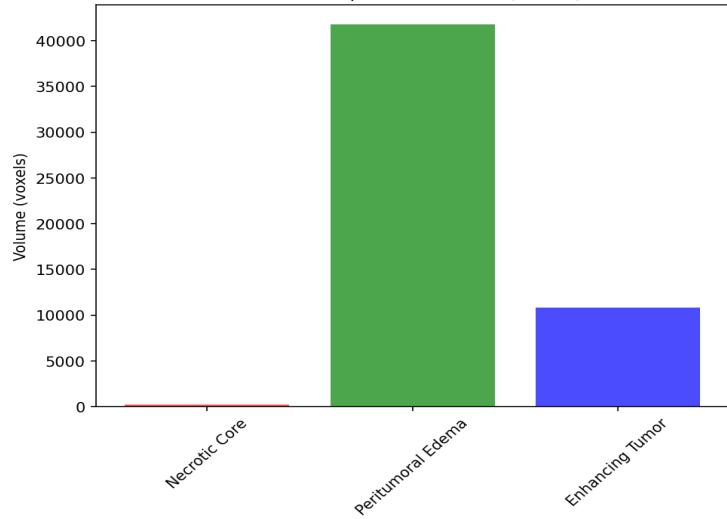
Coronal View



Axial View

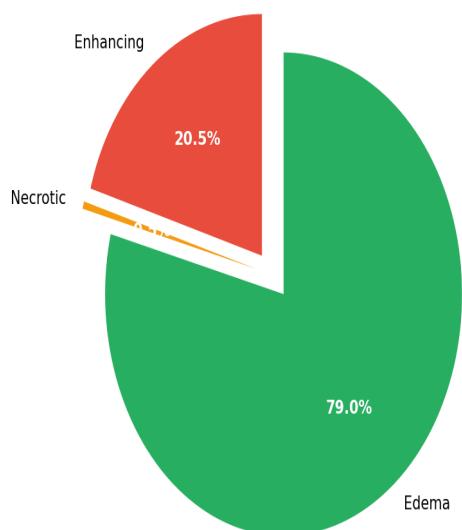


Tumor Component Volumes (voxels)

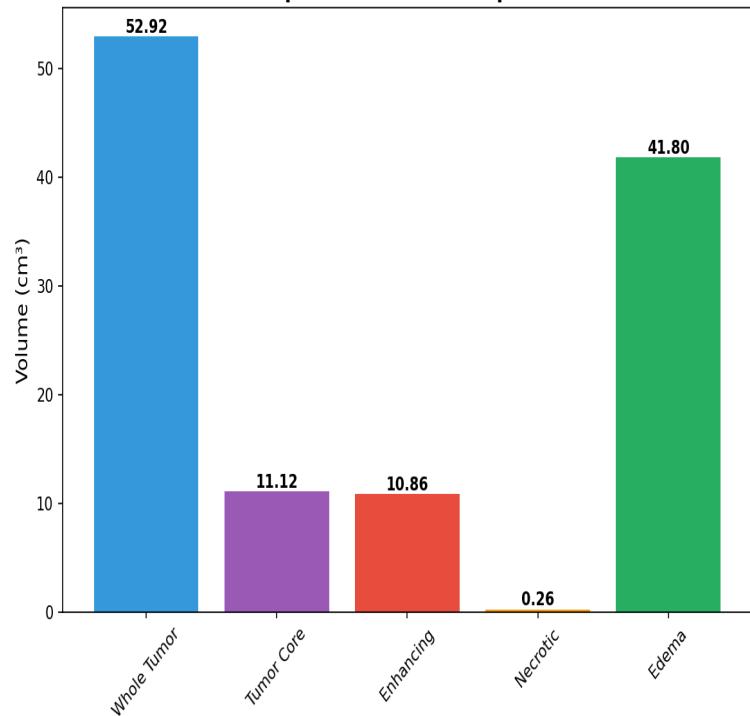


QUANTITATIVE ANALYSIS

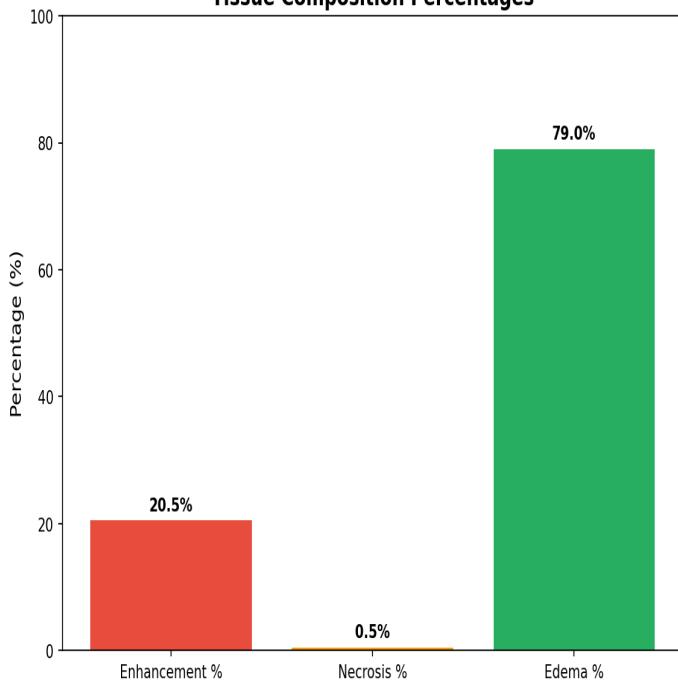
Tumor Component Distribution



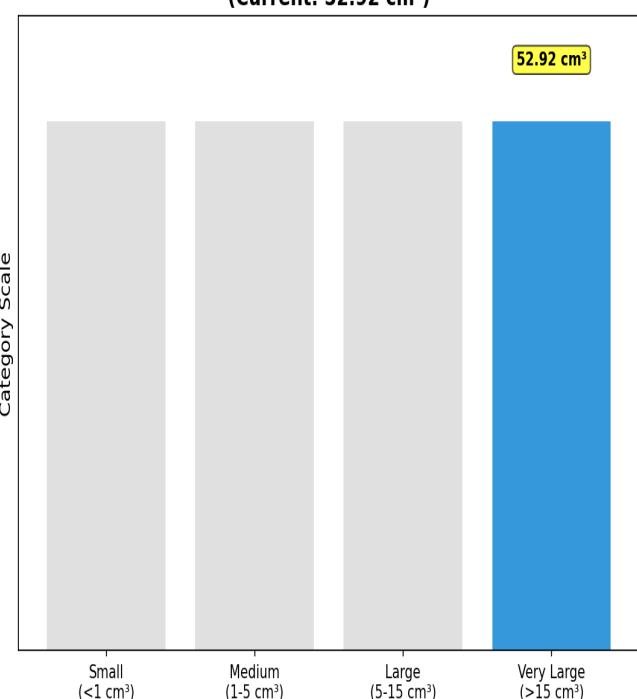
Component Volume Comparison



Tissue Composition Percentages



Tumor Size Classification
(Current: 52.92 cm³)



Clinical Summary Table

Parameter	Value	Clinical Significance
Total Volume	52.92 cm³	very_large (>15 cm³)
Maximum Diameter	62.0 mm	Surgical planning reference
Enhancement	20.5%	moderate (10-30%)
Necrosis	0.5%	minimal (<10%)
Location	right central	Functional considerations
Enhancement Present	yes	Blood-brain barrier disruption
Necrosis Present	yes	Tissue viability indicator
Edema Present	yes	Peritumoral involvement

IMPORTANT DISCLAIMERS

- This report is generated using artificial intelligence algorithms for automated brain tumor segmentation and analysis.
- The AI model used for report generation is designed to assist healthcare professionals but does not replace clinical judgment.
- All quantitative measurements and assessments should be validated by qualified radiologists and medical professionals.
- Treatment decisions should not be based solely on this automated analysis.
- This system is intended for research and educational purposes and to support clinical decision-making.
- Report generated on September 17, 2025 at 08:12 PM using microsoft/DialoGPT-medium.