

BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T20:03:41.640983
Case ID	case_c4c95e84-72c8-4fca-a1a7-f14b6e2b2239

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

A large right-sided central brain tumor with moderate enhancement and minimal necrosis is identified. The lesion demonstrates significant peritumoral edema and exhibits morphological features consistent with a high-grade glioma. Quantitative analysis reveals a tumor volume of 52.92 cm^3 , with an enhancing component comprising approximately 20.5% of the total tumor volume. These findings support the need for prompt multidisciplinary evaluation and consideration of biopsy or surgical resection.

TUMOR MORPHOLOGY AND LOCATION

- Location: Right hemisphere, central brain region
- Size Classification: Very large (tumor volume $>15 \text{ cm}^3$)
- Maximum Diameter: 62.0 mm
- Anatomical Considerations: The central location in the right hemisphere may pose risks for motor, sensory, or cognitive deficits depending on involvement of adjacent structures such as the motor cortex or white matter tracts.

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 is suggestive of active tumor proliferation and blood-brain barrier disruption, commonly seen in high-grade gliomas. The absence of extensive rim enhancement may indicate less aggressive tumor behavior, though further histopathological correlation is required.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

|--|--||

| Enhancing Tissue | Present | Indicates viable tumor tissue with active vascularization and potential for growth. |

| Necrotic Core | Present | Minimal necrosis (0.5%) suggests relatively well-perfused tumor, possibly indicating lower-grade histology or recent treatment effect. |

| Peritumoral Edema | Present | Extensive edema (79%) is consistent with high-grade glioma or aggressive neoplasm, potentially causing mass effect and increased intracranial pressure. |

CLINICAL ASSESSMENT

- Tumor Grade Indicators: Moderate enhancement, minimal necrosis, and extensive edema are consistent with anaplastic glioma or glioblastoma, particularly in the context of central location and large size.
- Differential Diagnosis: Likely high-grade glioma (e.g., glioblastoma multiforme or anaplastic astrocytoma), with possibility of other infiltrative lesions such as metastasis or lymphoma.
- Prognosis Indicators: The presence of significant edema and large tumor volume may suggest a more aggressive course; however, the minimal necrotic component and moderate enhancement pattern may indicate a less diffusive tumor phenotype.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurosurgical consultation for potential biopsy or resection. Consider neuroimaging with contrast-enhanced T1-weighted sequences to assess for mass effect and midline shift.
2. Additional Imaging: MRI with diffusion-weighted imaging (DWI) and magnetic resonance spectroscopy (MRS) to further characterize the lesion.
3. Multidisciplinary Review: Involvement of neuro-oncology, radiation oncology, and neuropathology teams for staging and treatment planning.
4. Follow-up Protocol: MRI follow-up in 2–4 weeks post-intervention or if clinical deterioration occurs.
5. Treatment Considerations: Consider surgical resection with histopathological confirmation. Adjuvant radiation therapy and/or chemotherapy should be considered based on final 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 overestimation of edema and inability to distinguish between tumor recurrence and treatment-related changes without clinical correlation.

Report Generated: September 17, 2025 at 08:03 PM

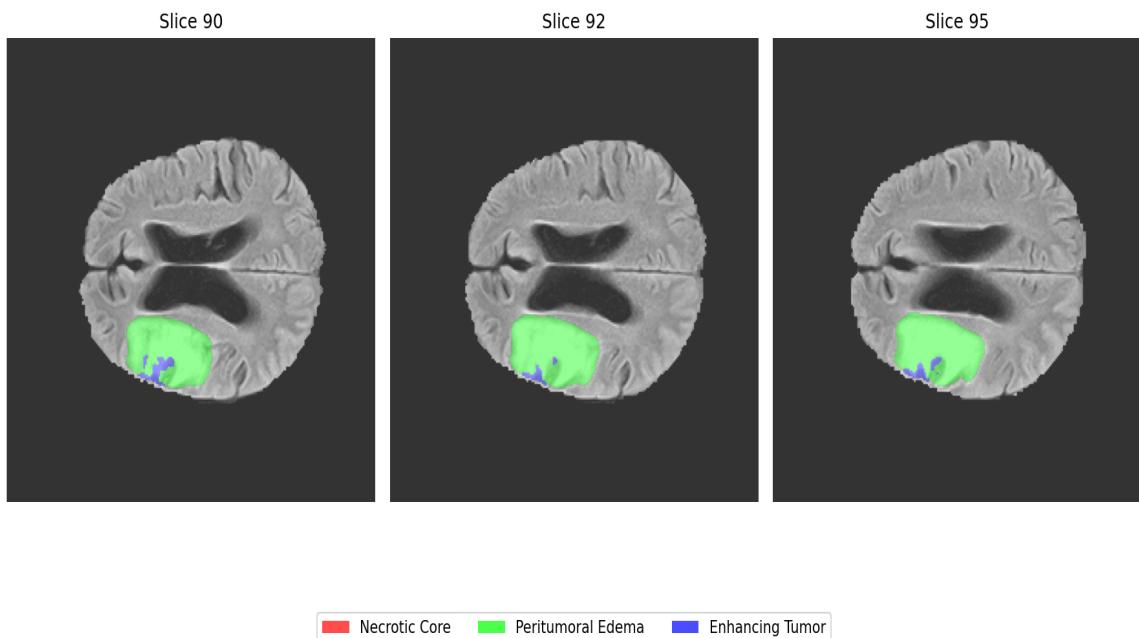
System: AI-Assisted Brain Tumor Analysis Platform

Case ID: case_c4c95e84-72c8-4fca-a1a7-f14b6e2b2239

SEGMENTATION VISUALIZATIONS

FLAIR Segmentation Overlay

FLAIR with Segmentation Overlay



T1CE Segmentation Overlay

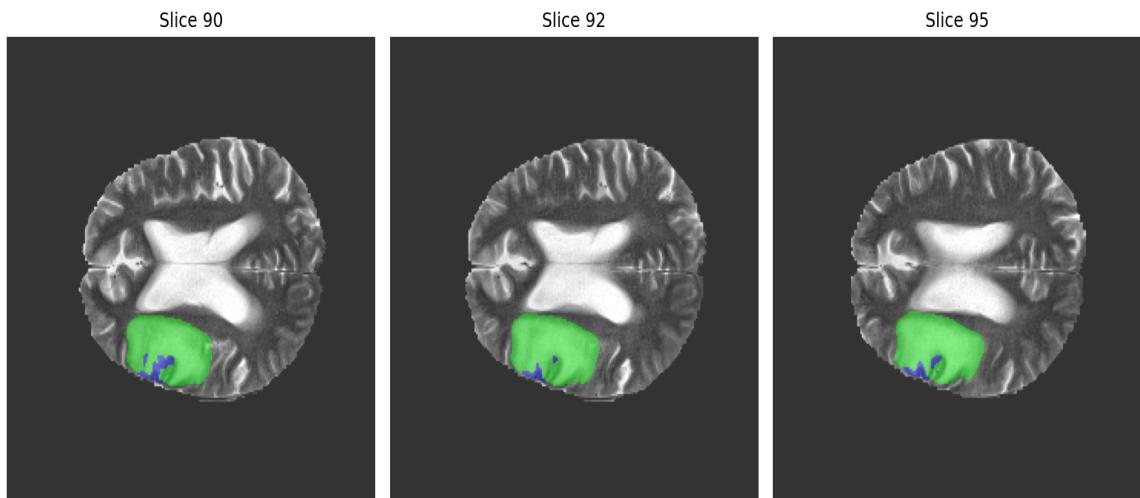
T1CE with Segmentation Overlay



■ 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

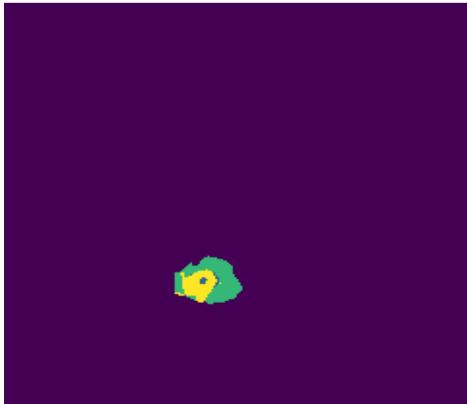
Sagittal View



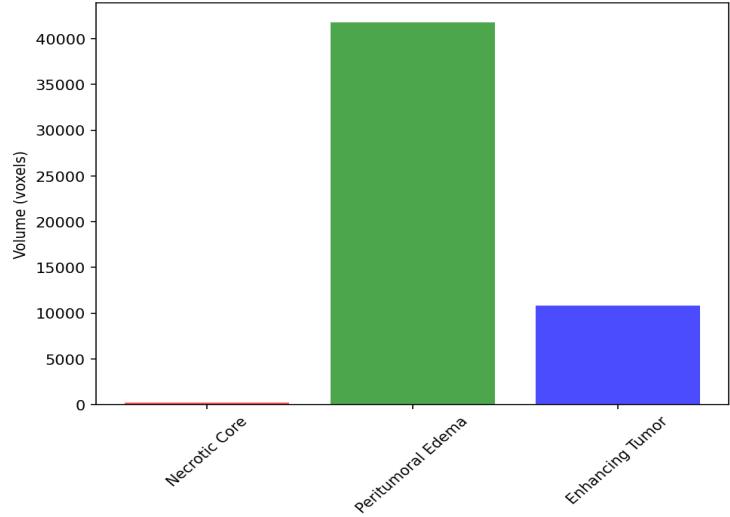
Coronal View



Axial View

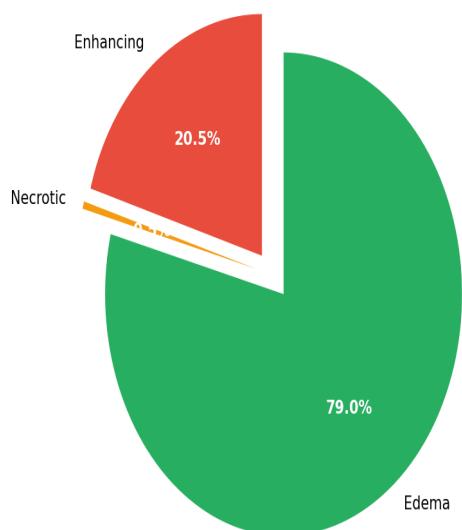


Tumor Component Volumes (voxels)

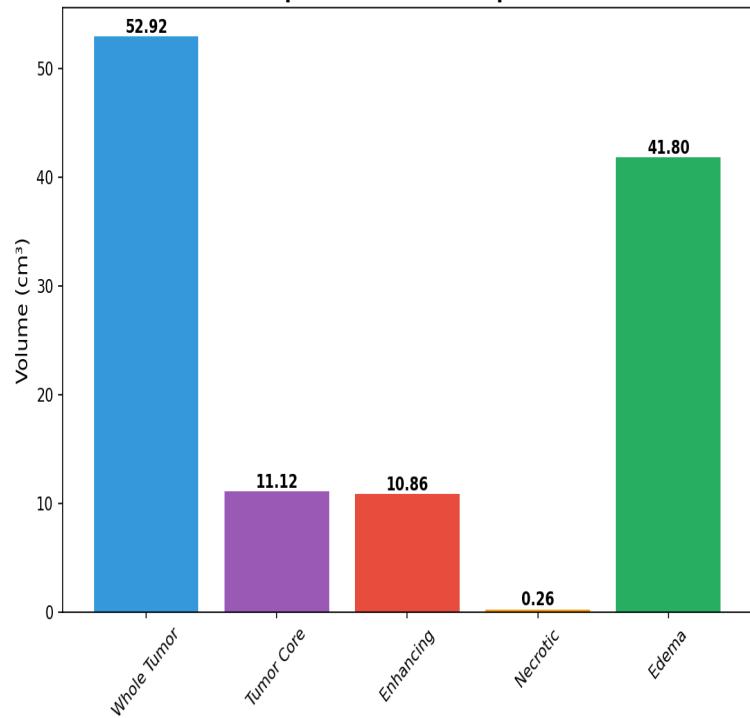


QUANTITATIVE ANALYSIS

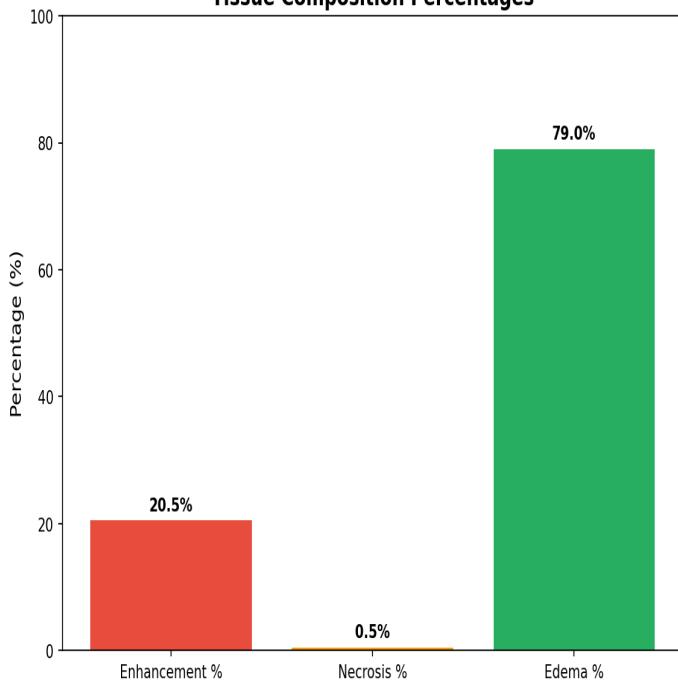
Tumor Component Distribution



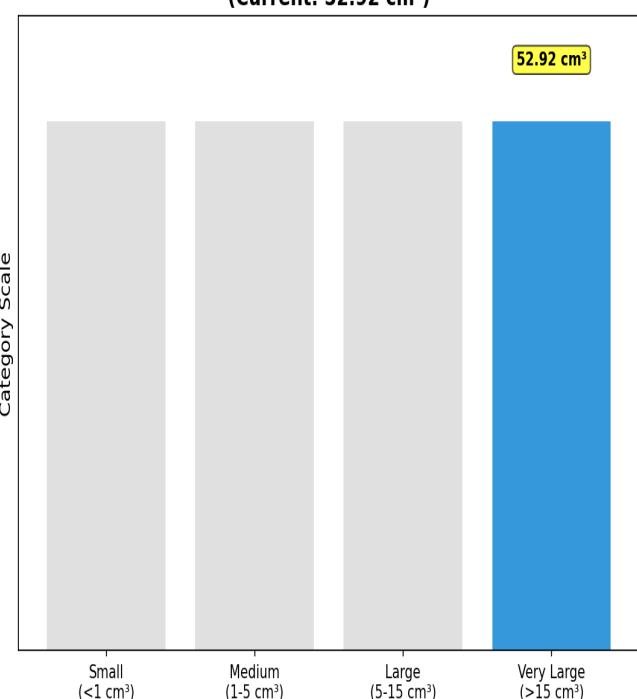
Component Volume Comparison



Tissue Composition Percentages



Tumor Size Classification
(Current: 52.92 cm³)



Clinical Summary Table

Parameter	Value	Clinical Significance
Total Volume	52.92 cm ³	very_large (>15 cm ³)
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 08:03 PM using microsoft/DialoGPT-medium.