BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T22:04:53.665351
Case ID	case_07e4a90e-e139-457d-b104-09433575845d

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case demonstrates a large right-sided brain tumor with moderate enhancement and significant peritumoral edema. The tumor exhibits a heterogeneous composition with a small necrotic component and a predominantly enhancing core. These findings are consistent with a high-grade glioma, likely an anaplastic astrocytoma or glioblastoma, warranting urgent multidisciplinary evaluation and consideration of biopsy or surgical resection.

TUMOR MORPHOLOGY AND LOCATION

- Location: Right hemisphere, central region
- Size Classification: Very large (>15 cm^3)
- Maximum Diameter: 62.0 mm
- Anatomical Considerations: The central location in the right hemisphere may pose risks for motor and sensory function, depending on the specific anatomical structures involved. Given the presence of significant edema, potential for mass effect and midline shift should be evaluated clinically.

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 HU, Maximum 1146.00 HU
- Clinical Significance: Moderate enhancement with a high maximum intensity suggests active tumor proliferation and likely intact blood-brain barrier disruption. This pattern is commonly seen in high-grade gliomas and indicates a need for further histopathological evaluation.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

|--|--||

| Enhancing Tissue | Present | Indicates viable tumor tissue with active angiogenesis and potential for aggressive behavior. |

| Necrotic Core | Present | Minimal necrosis (0.5%) suggests relatively well-perfused tumor with limited areas of ischemia. |

| Peritumoral Edema | Present | Extensive edema (79%) is consistent with high-grade glioma and may contribute to mass effect. |

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Moderate enhancement, significant edema, and absence of cystic changes suggest a high-grade glioma (e.g., glioblastoma or anaplastic astrocytoma).

• Differential Diagnosis: Likely high-grade glioma (e.g., glioblastoma multiforme or anaplastic astrocytoma), with features favoring a more aggressive histology.

• Prognosis Indicators: Large tumor volume, presence of edema, and moderate enhancement are associated with a poorer prognosis. However, the minimal necrosis may indicate a less aggressive subtype.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurosurgical consultation for potential biopsy or resection. Clinical assessment for neurological deficits.

2. Additional Imaging: Consider perfusion MRI or MR spectroscopy to further characterize the tumor.

3. Multidisciplinary Review: Involvement of neuro-oncology, radiation oncology, and neuropathology for staging and treatment planning.

4. Follow-up Protocol: MRI with contrast at 6–12 weeks post-treatment, or earlier if clinical deterioration occurs.

5. Treatment Considerations: Surgical resection if feasible; adjuvant radiation and chemotherapy should be considered based on histology and molecular markers.

TECHNICAL NOTES

• Image Quality: Adequate for diagnostic interpretation.

• Segmentation Confidence: High automated detection accuracy.

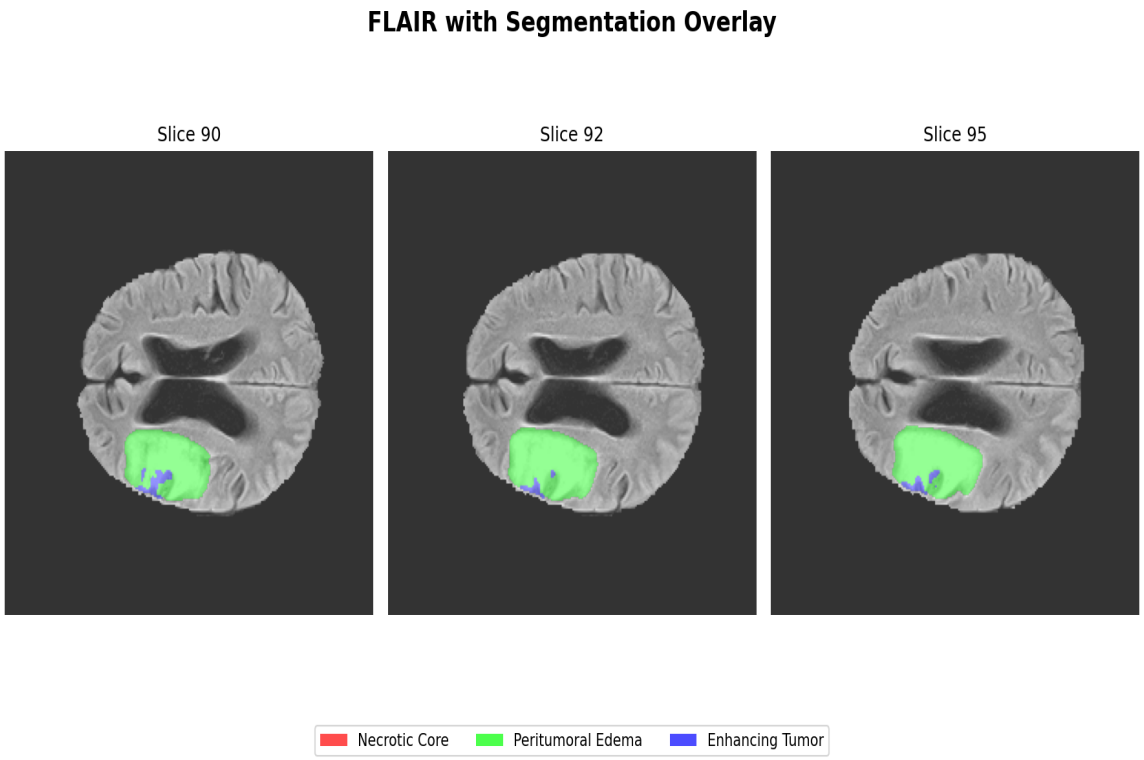
• Limitations: Standard limitations of MRI-based analysis include potential underestimation of infiltrative components and inability to fully characterize molecular subtypes without histopathological correlation.

Report Generated: September 17, 2025 at 10:04 PM

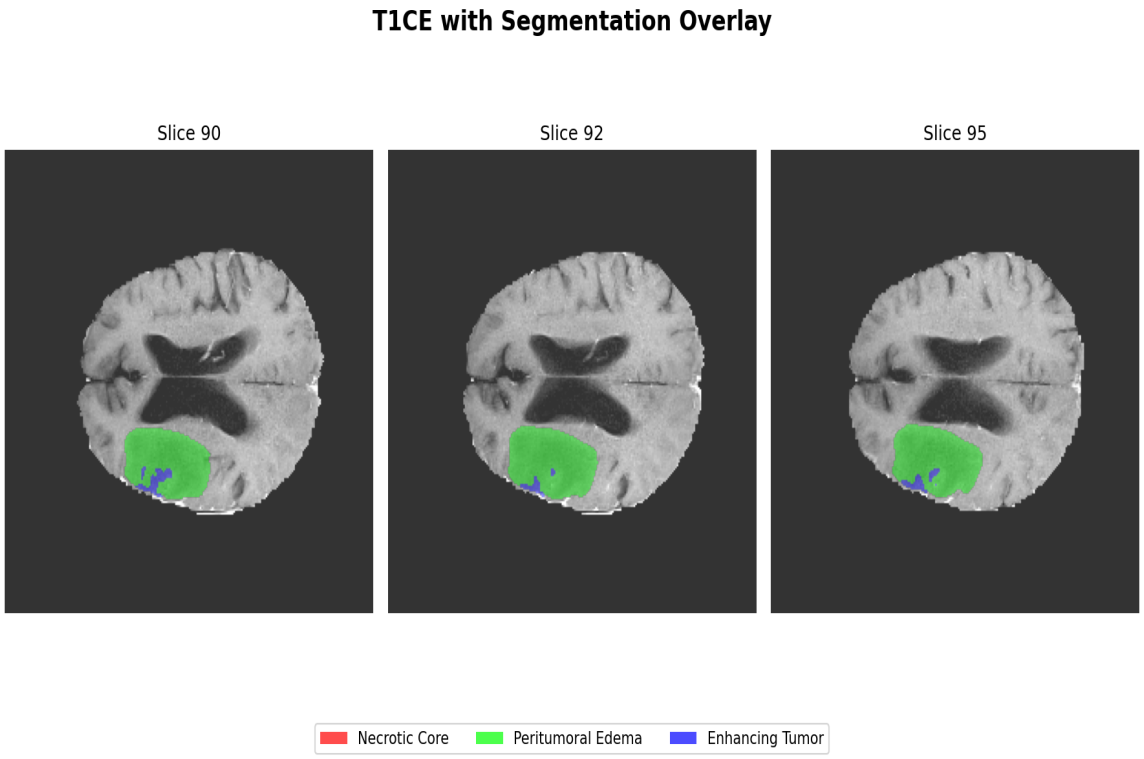
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

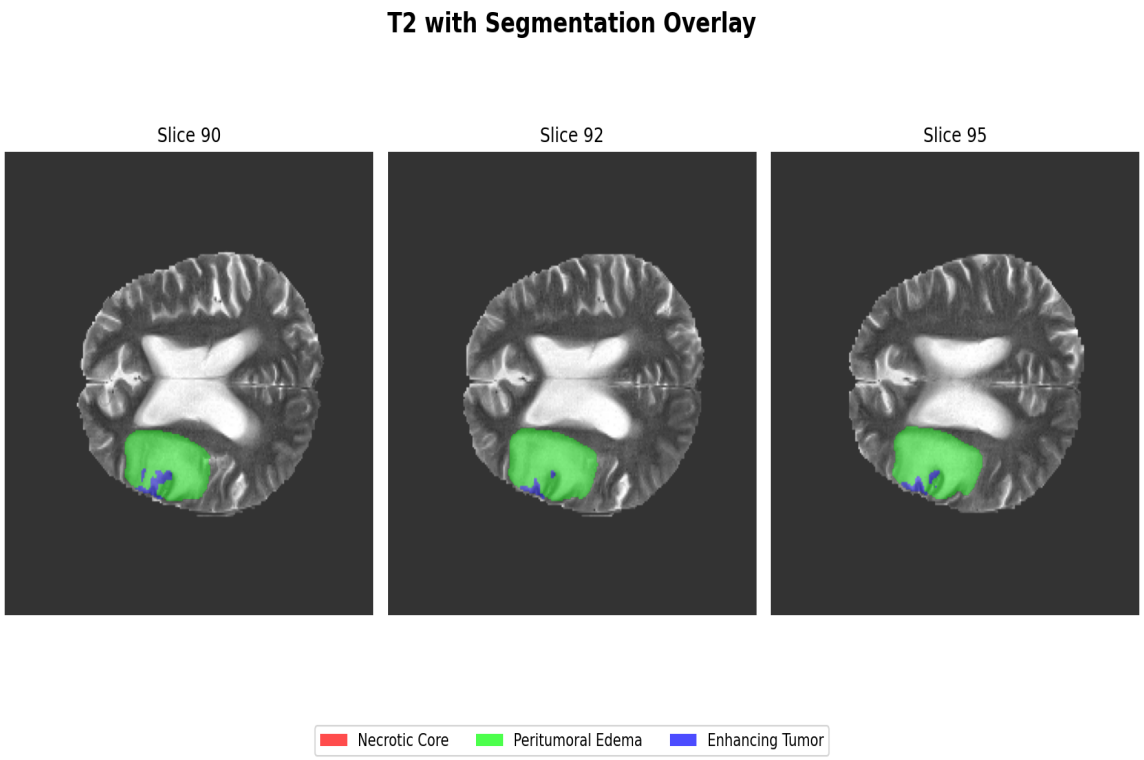
FLAIR Segmentation Overlay



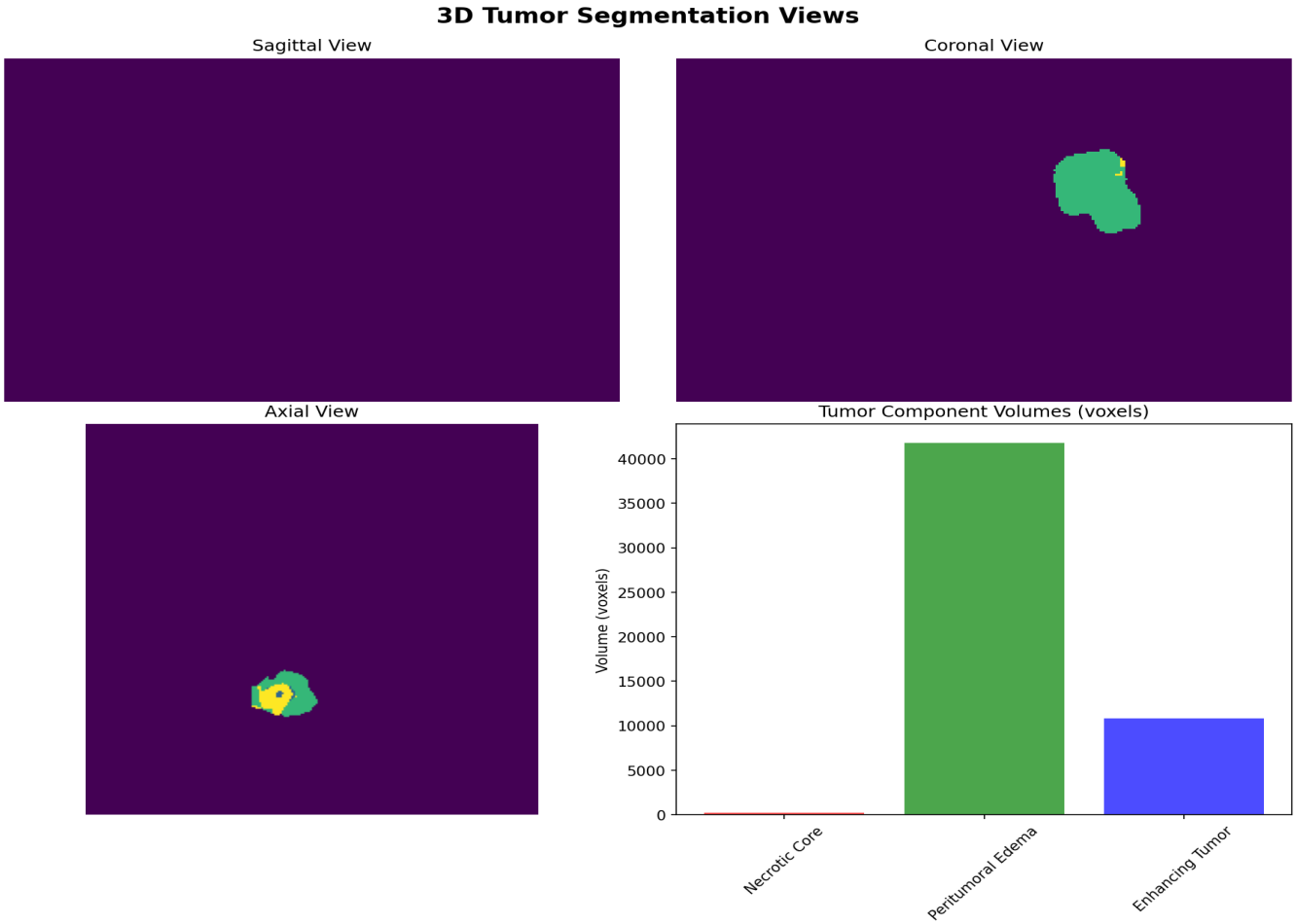
T1CE Segmentation Overlay



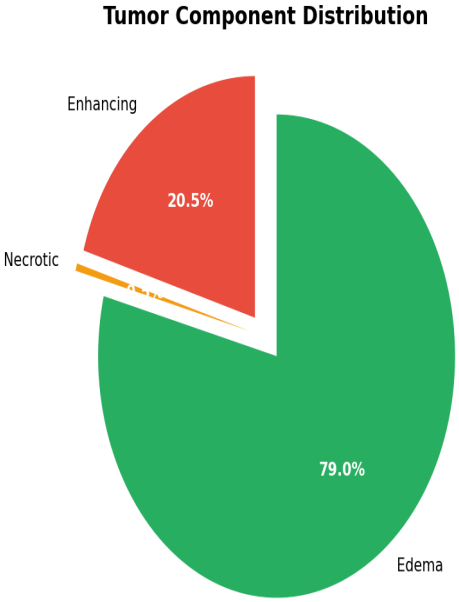
T2 Segmentation Overlay

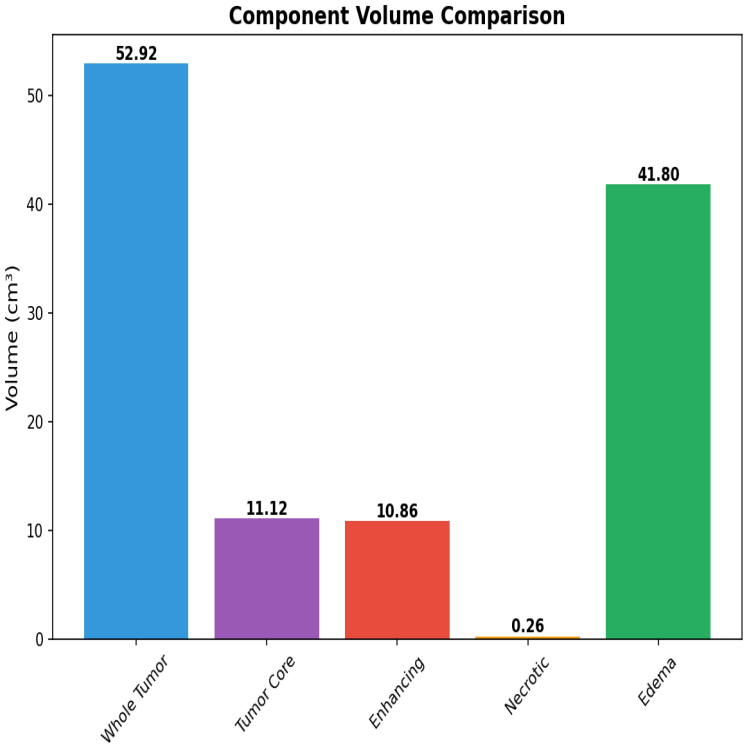


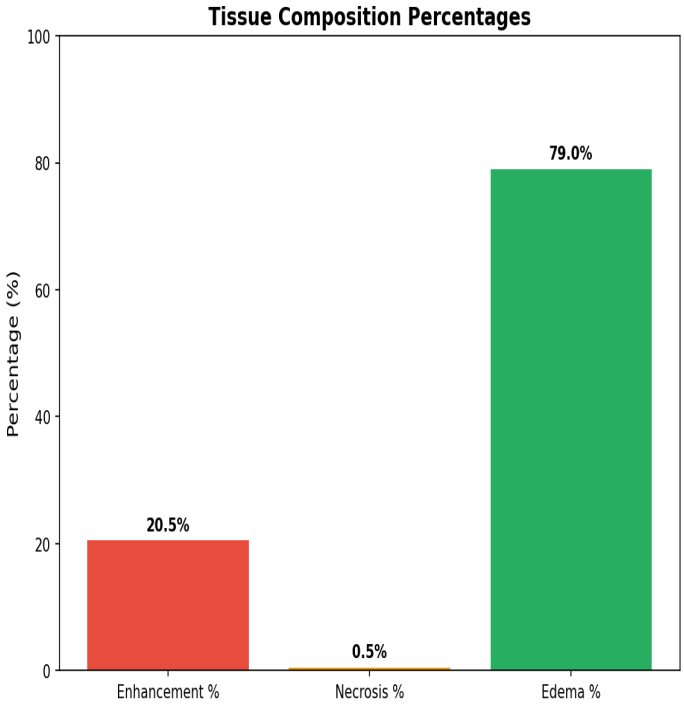
3D Volume Analysis

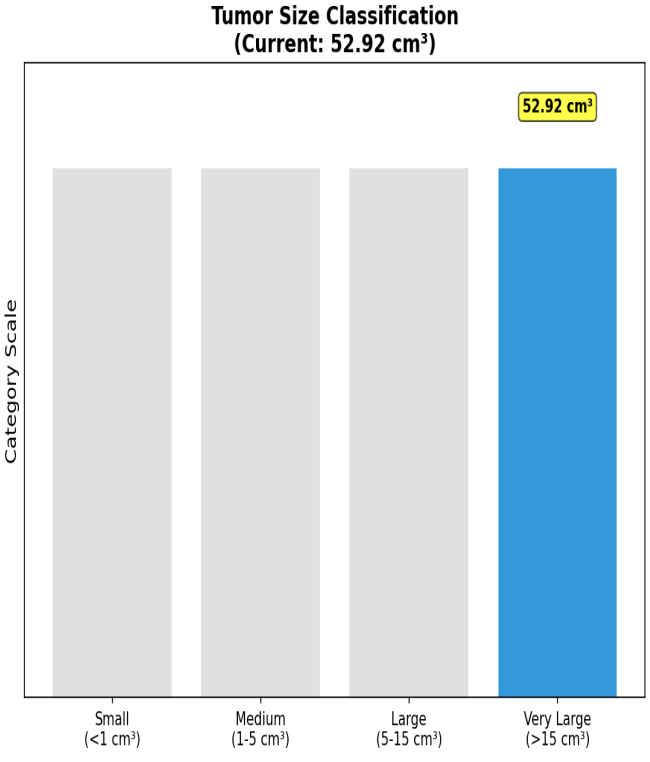

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

QUANTITATIVE ANALYSIS









Clinical Summary Table

Parameter	Value	Clinical Significance
Total Volume	52.92 cm³	very_large (>15 cmÂ³)
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 10:04 PM using microsoft/DialoGPT-medium.