BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T20:08:03.381678
Case ID	case_432a1b68-95c2-4997-9523-172633b7296f

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

A large right-sided central brain tumor with moderate enhancement and minimal necrosis is identified. The tumor demonstrates significant peritumoral edema and exhibits features consistent with a high-grade glioma. This imaging profile supports the need for prompt clinical evaluation and multidisciplinary management.

TUMOR MORPHOLOGY AND LOCATION

- Location: Right hemisphere, central brain 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 adjacent anatomical structures. The presence of significant edema may contribute to mass effect and neurological symptoms.

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 consistent with active tumor proliferation and blood-brain barrier disruption, commonly seen in high-grade gliomas. The absence of extensive rim enhancement suggests limited vascular proliferation or encapsulation.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Present/Absent | Clinical Interpretation |

||-|--|

| Enhancing Tissue | Present | Indicates viable tumor tissue with active proliferation and BBB disruption. |

| Necrotic Core | Present | Minimal necrosis (0.5%) suggests relatively well-perfused tumor with low central ischemia. |

| Peritumoral Edema | Present | Extensive edema (79%) indicates significant mass effect and likely inflammatory response. |

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Moderate enhancement, minimal necrosis, and extensive edema are consistent with a high-grade glioma (e.g., glioblastoma or anaplastic astrocytoma).

• Differential Diagnosis: Likely glioblastoma multiforme (GBM) or anaplastic astrocytoma, given the large volume, moderate enhancement, and presence of edema.

• Prognosis Indicators: The presence of edema and moderate enhancement may indicate aggressive tumor behavior. However, the minimal necrosis suggests a potentially more indolent course compared to GBM with extensive necrosis.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurosurgical consultation for potential biopsy or resection.

2. Additional Imaging: Consider perfusion MRI or spectroscopy for further characterization of tumor biology.

3. Multidisciplinary Review: Initiate tumor board discussion including neuro-oncology, radiation oncology, and neurosurgery.

4. Follow-up Protocol: MRI with contrast every 3–6 months post-treatment.

5. Treatment Considerations: Consider adjuvant radiation and chemotherapy based on histological findings and tumor grade.

TECHNICAL NOTES

• Image Quality: Adequate for diagnostic interpretation

• Segmentation Confidence: High automated detection accuracy

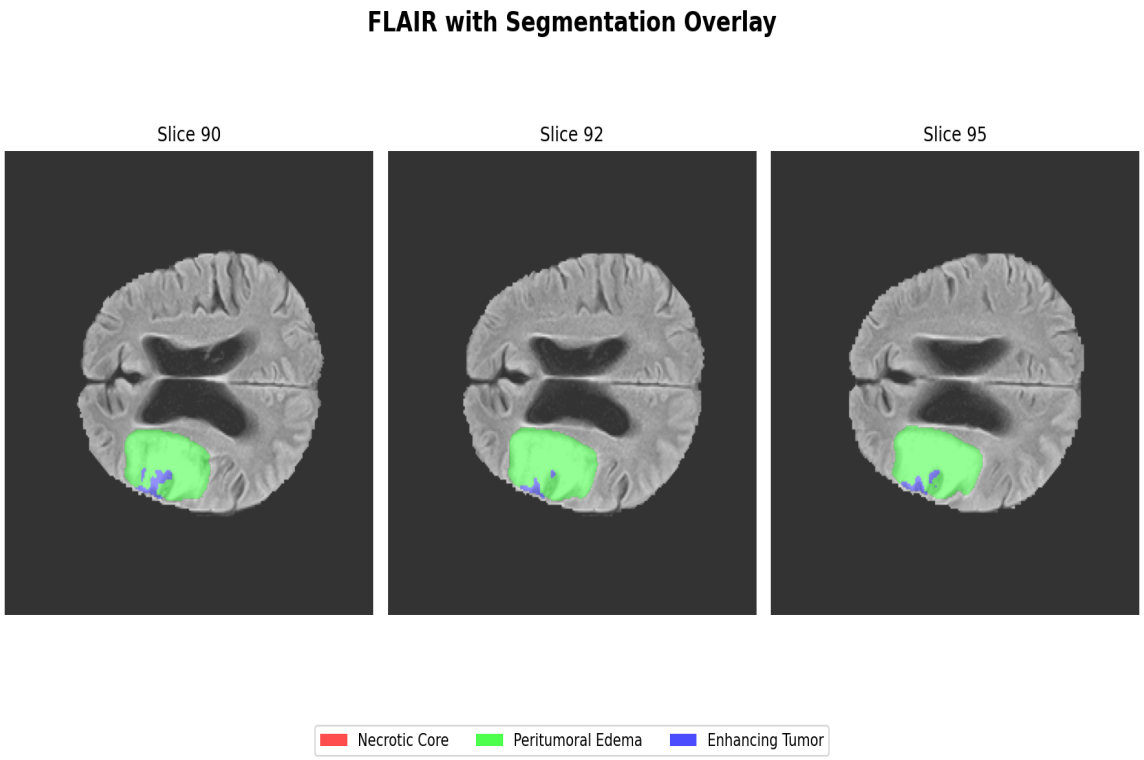
• Limitations: Standard limitations of MRI-based analysis include potential underestimation of subtle tissue changes and reliance on contrast enhancement for viability assessment.

Report Generated: September 17, 2025 at 08:07 PM

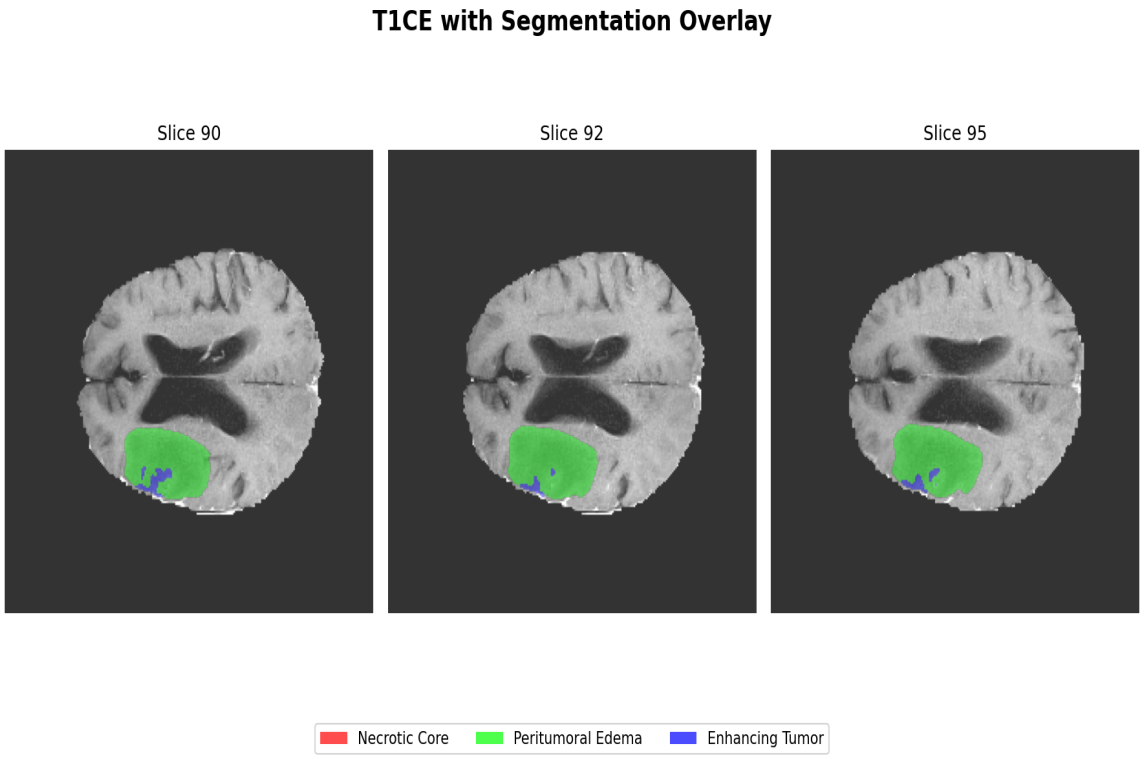
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

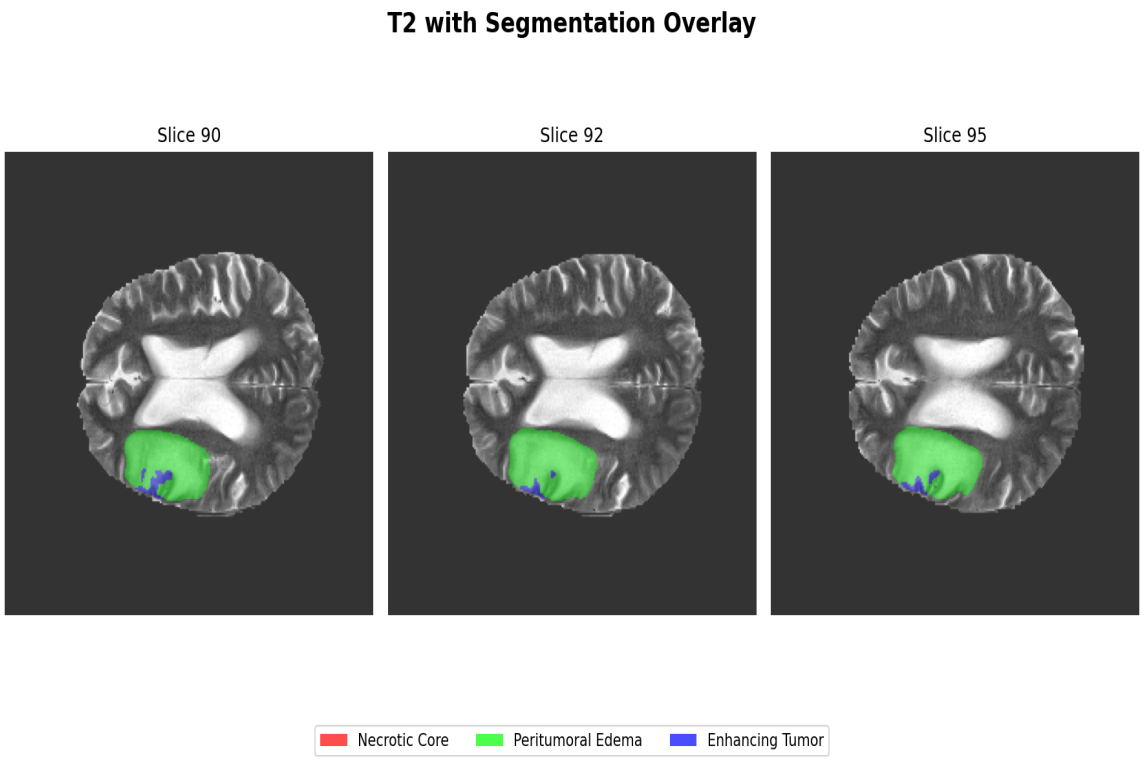
FLAIR Segmentation Overlay



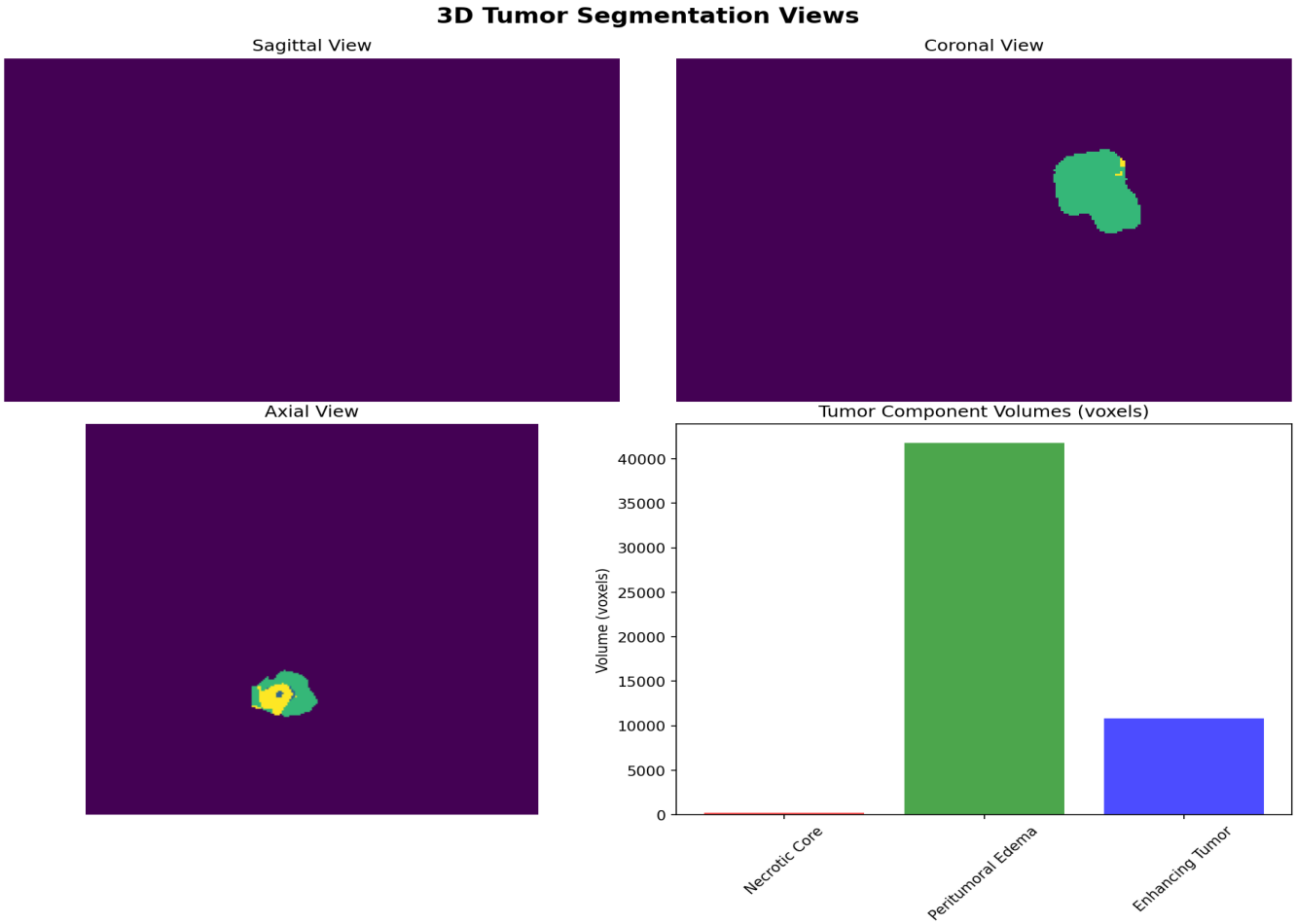
T1CE Segmentation Overlay



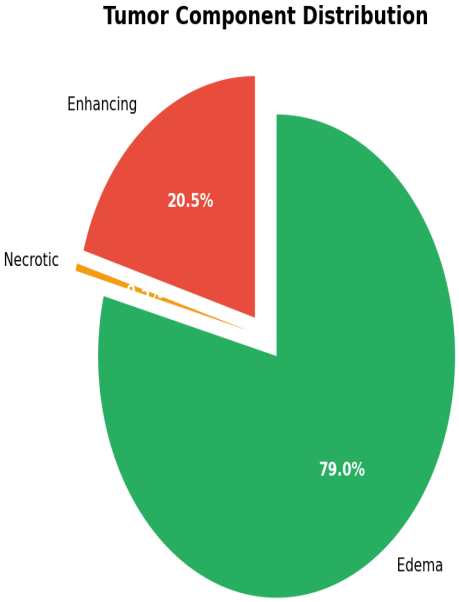
T2 Segmentation Overlay

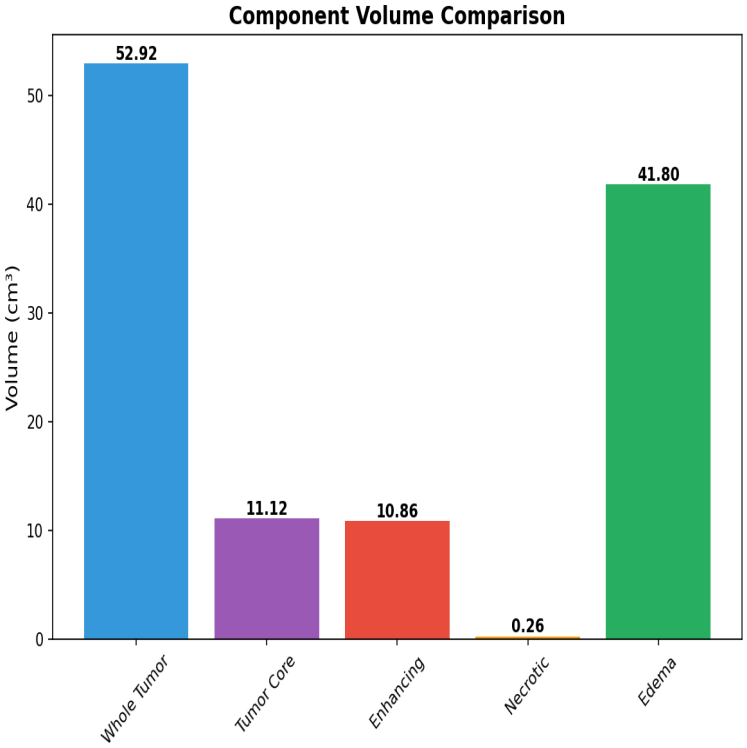


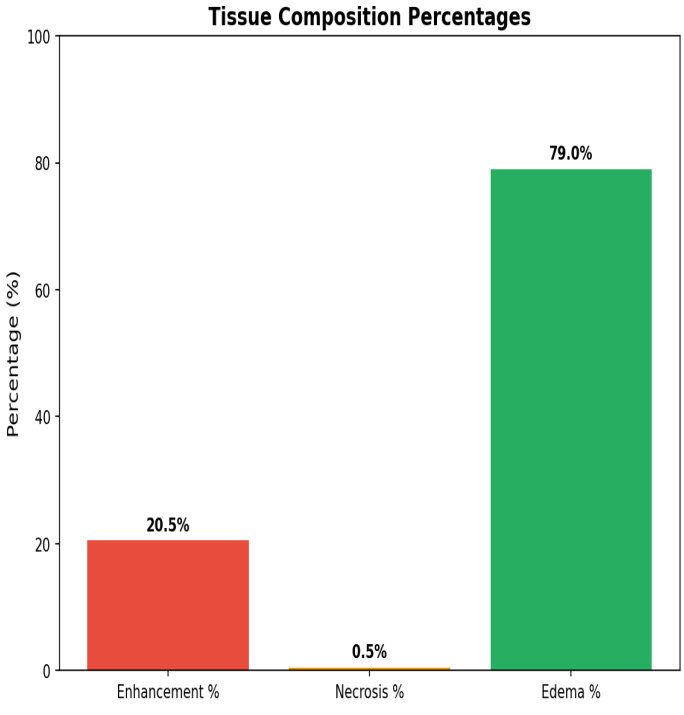
3D Volume Analysis

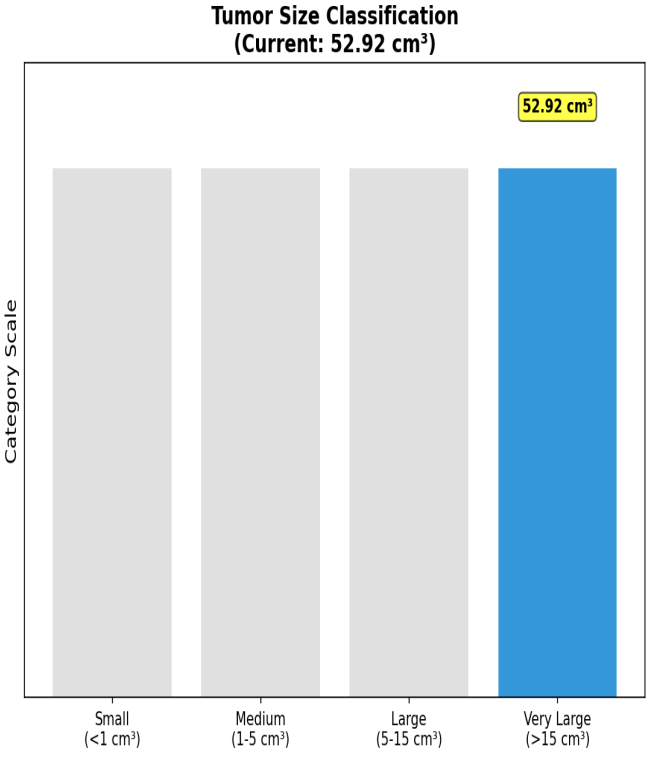

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 08:08 PM using microsoft/DialoGPT-medium.