BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-15T07:24:41.199644
Case ID	case_e38f8866-33ec-49d9-8493-2b494958f5bc

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This MRI-based brain tumor segmentation analysis identifies a large right-sided central brain lesion with heterogeneous tissue composition. The tumor demonstrates moderate enhancement, minimal necrosis, and significant peritumoral edema. These findings suggest an aggressive neoplasm requiring urgent multidisciplinary evaluation and management planning.

TUMOR MORPHOLOGY AND LOCATION

- Location: Right cerebral hemisphere, central brain region
- Size Classification: Very large (tumor volume >15 cm^3)
- Maximum Diameter: 62.0 mm
- Anatomical Considerations: The central location in the right hemisphere may impact motor or sensory function, depending on proximity to eloquent cortices such as the primary motor or sensory areas.

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 typically indicates active tumor proliferation with intact blood-brain barrier integrity; low-intensity necrosis confirms viable tumor parenchyma despite focal areas of cell death.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

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| Enhancing Tissue | Present | Suggests active tumor biology including angiogenesis and cellular proliferation; consistent with high-grade glioma or metastatic disease. |

| Necrotic Core | Present | Minimal necrosis (0.5%), indicating recent or ongoing treatment effect or inherent aggressiveness; not typical of benign tumors. |

| Peritumoral Edema | Present | Extensive perilesional edema (79%) is highly suggestive of infiltrative nature, possibly implying glioblastoma or other high-grade gliomas due to cytotoxic effects or microvascular compromise. |

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Large size (>5 cm), presence of enhancing component, significant edema, and minimal necrosis point toward a high-grade lesion.

• Differential Diagnosis: Likely glioblastoma multiforme (GBM), anaplastic astrocytoma, or metastatic brain tumor; further histopathologic confirmation required for definitive classification.

• Prognosis Indicators: Extensive edema, large enhancing volume, and focal necrosis suggest poor prognosis without effective intervention.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurosurgical consultation; consideration of biopsy or resection for histopathological confirmation.

2. Additional Imaging: Consider perfusion MRI and/or MRS to assess tumor metabolism and vascularity.

3. Multidisciplinary Review: Engagement of neuro-oncology team, radiation oncology, and neuropsychology for comprehensive care plan development.

4. Follow-up Protocol: Surgical planning within 2–4 weeks post-consent; follow-up MRI at 3–6 months post-treatment.

5. Treatment Considerations: Based on imaging findings, initiate adjuvant therapy (radiotherapy + temozolomide) pending histopathology results.

TECHNICAL NOTES

• Image Quality: Adequate for diagnostic interpretation

• Segmentation Confidence: High automated detection accuracy

• Limitations: Standard MRI-based analysis lacks functional assessment and molecular profiling capabilities

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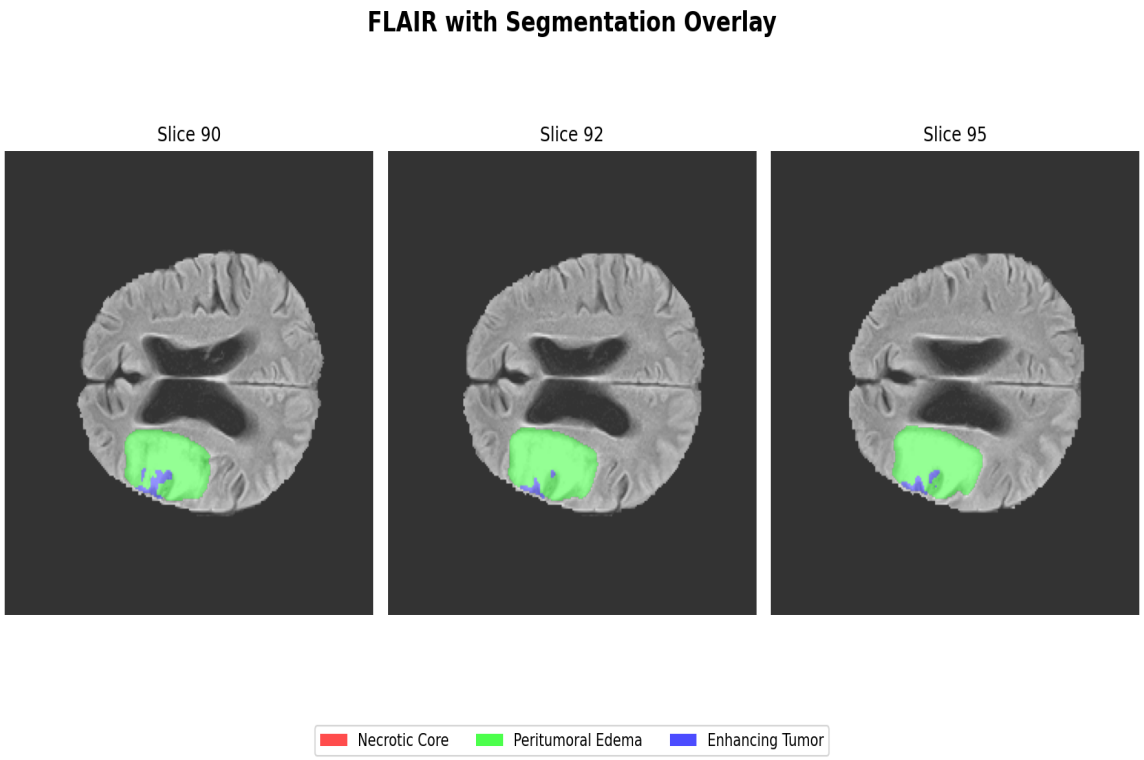
System: AI-Assisted Brain Tumor Analysis Platform

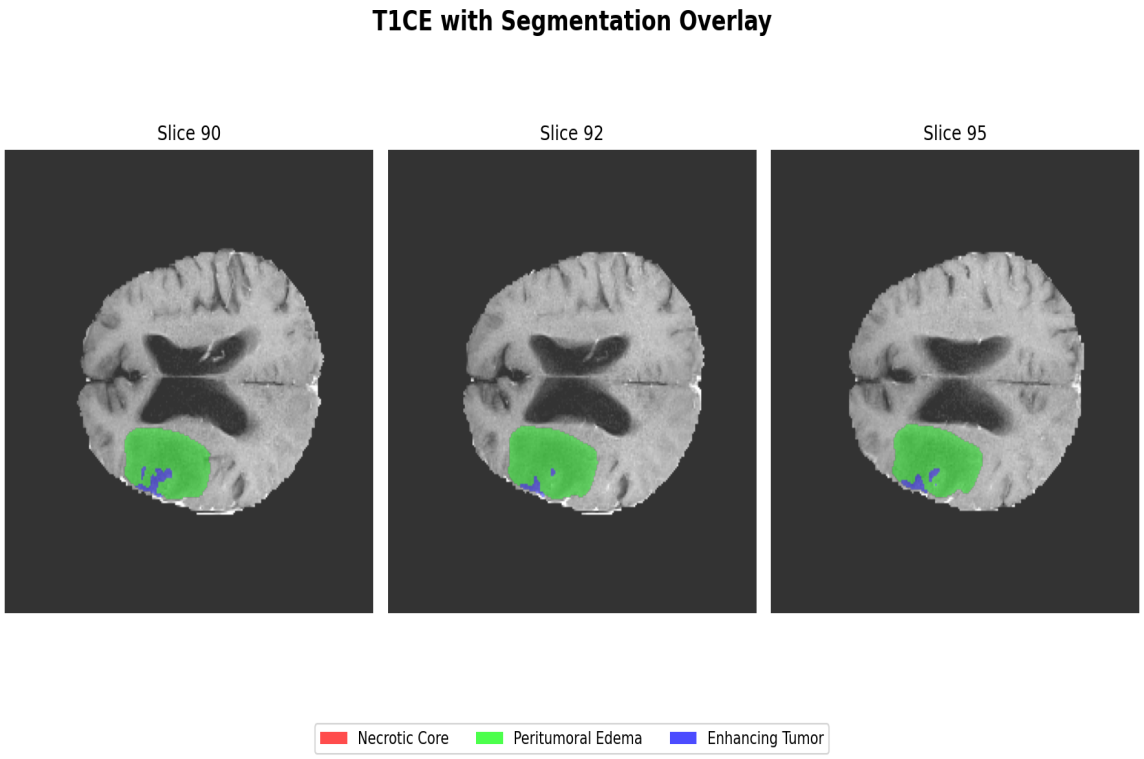
End of Report

SEGMENTATION VISUALIZATIONS

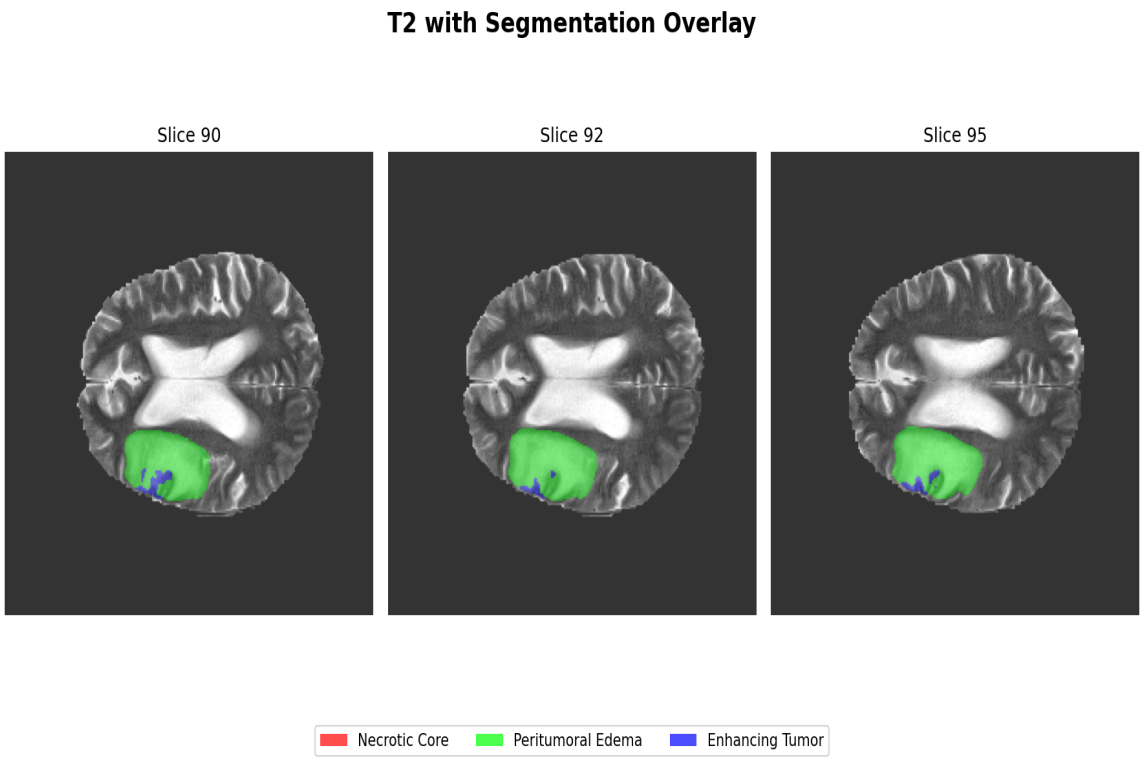
FLAIR Segmentation Overlay



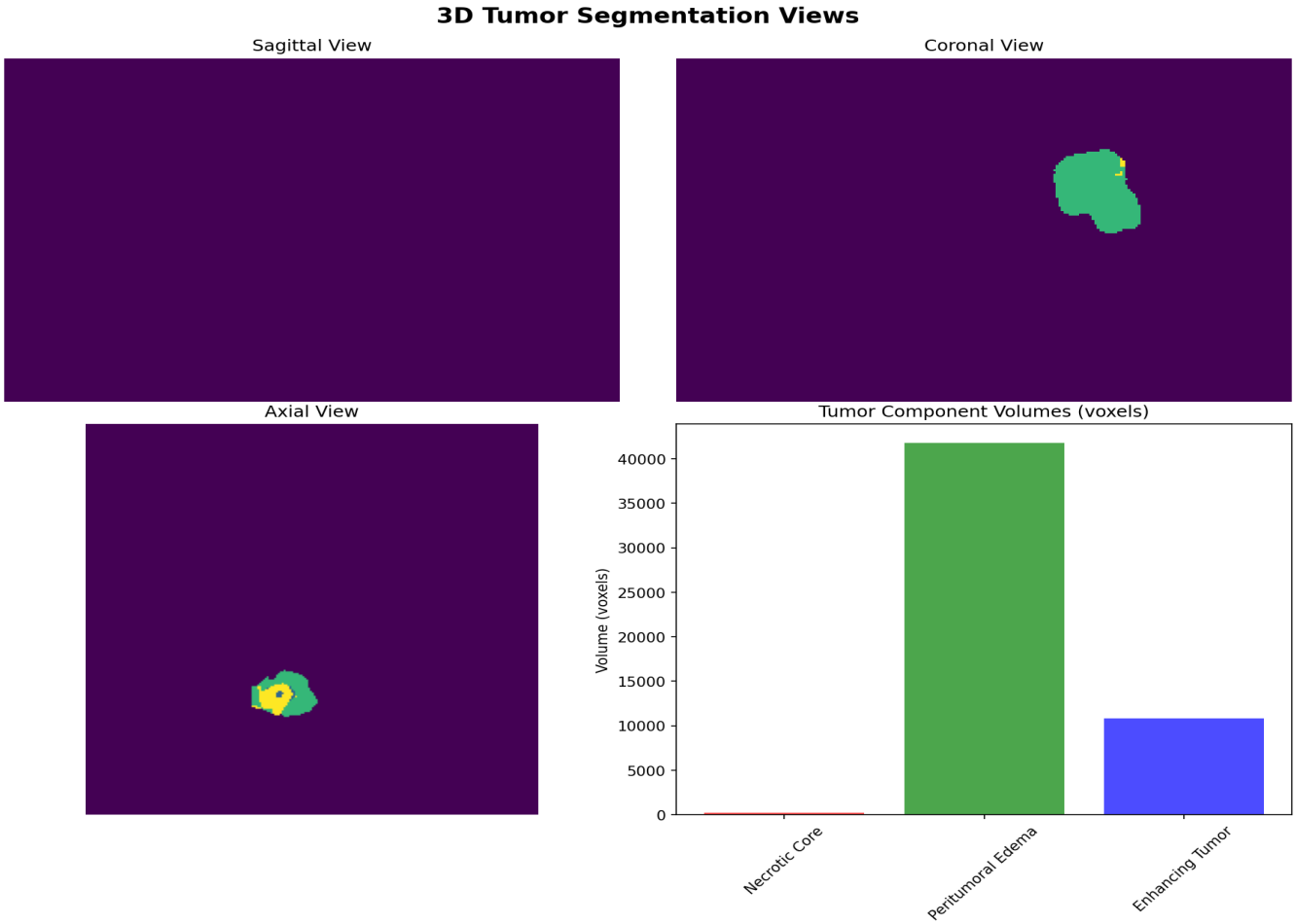
T1CE Segmentation Overlay



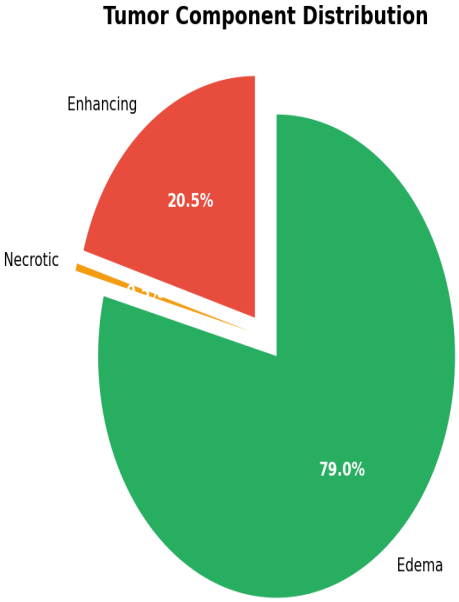
T2 Segmentation Overlay

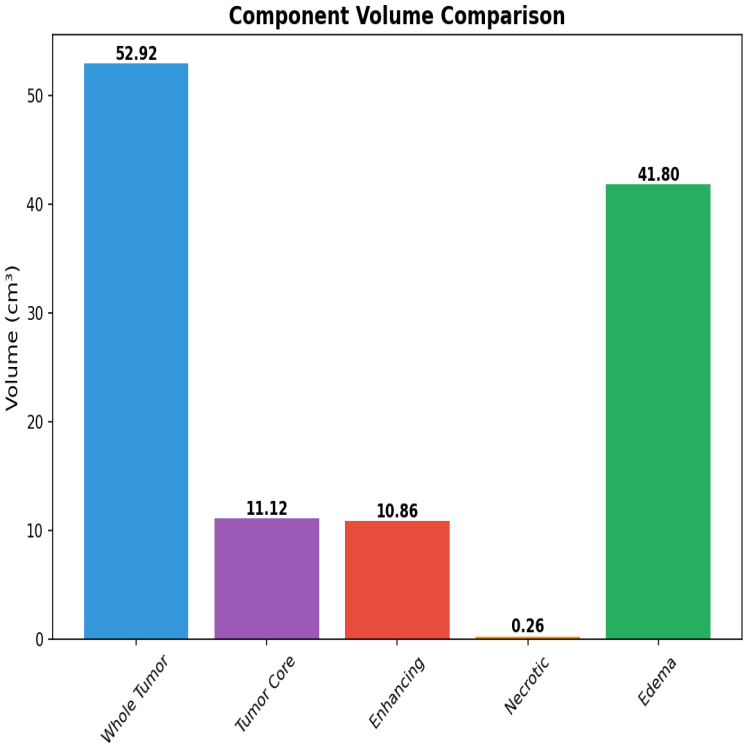


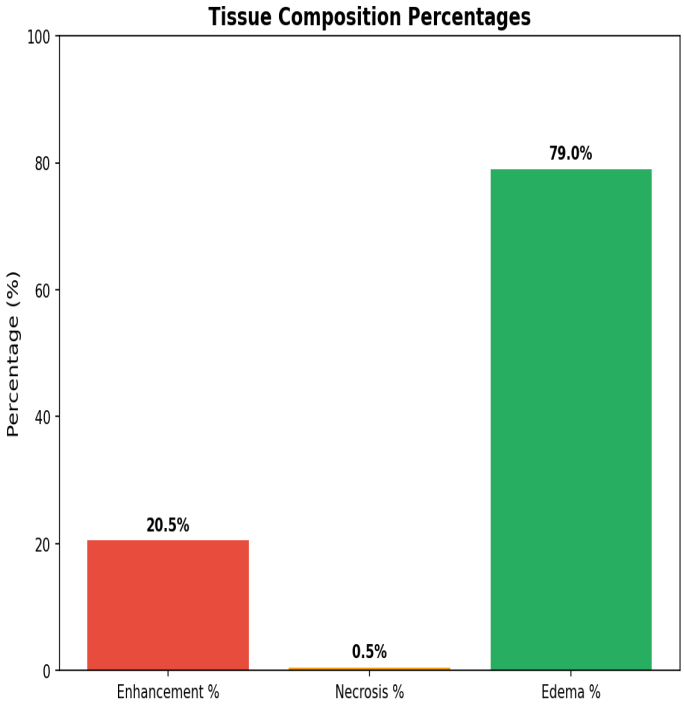
3D Volume Analysis

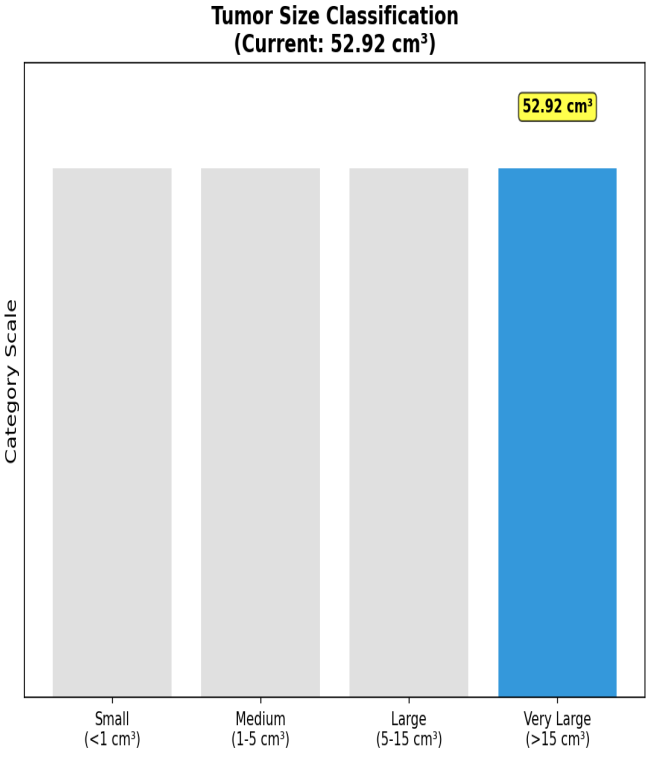

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 15, 2025 at 07:24 AM using microsoft/DialoGPT-medium.