BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-19T07:57:14.403665
Case ID	case_e4856777-32df-4755-ab95-7b4dcea40640

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case demonstrates a large right-sided central brain tumor with moderate enhancement and minimal necrosis, exhibiting significant peritumoral edema. The tumor is classified as very large based on volumetric measurements and shows features consistent with a high-grade glioma, though definitive histopathological correlation is required. Imaging findings suggest a potentially aggressive lesion with clinical implications for treatment planning and prognosis.

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 be associated with risk of involvement of critical motor and sensory pathways, potentially impacting neurological function and influencing surgical planning and radiation targeting.

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 commonly seen in high-grade gliomas and indicates active tumor proliferation or blood-brain barrier disruption. The absence of significant rim enhancement or irregular enhancement patterns does not support a highly aggressive or hemorrhagic component at this time.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Present/Absent | Clinical Interpretation |

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| Enhancing Tissue | Present | Indicates viable tumor tissue with active growth or perfusion; supports diagnosis of glioma. |

| Necrotic Core | Present | Minimal necrosis (0.5%) suggests early or low-grade necrotic change; not indicative of extensive tumor death. |

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

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Moderate enhancement, minimal necrosis, and extensive edema are consistent with anaplastic glioma or glioblastoma. The absence of significant hemorrhage or cystic components does not exclude high-grade pathology.

• Differential Diagnosis: Likely high-grade glioma (e.g., glioblastoma multiforme or anaplastic astrocytoma), given the tumor size, edema pattern, and enhancement characteristics. Other considerations include metastatic disease or lymphoma, though less likely without additional clinical data.

• Prognosis Indicators: The presence of extensive edema and moderate enhancement suggests a potentially aggressive tumor. The minimal necrosis and lack of hemorrhage may indicate a more indolent course, but overall tumor burden and location are concerning.

RECOMMENDATIONS

1. Immediate Actions: Surgical resection planning, if feasible, with consideration of functional MRI and DTI for mapping critical pathways.

2. Additional Imaging: Consider perfusion MRI and spectroscopy to further characterize tumor metabolism and differentiate from other lesions.

3. Multidisciplinary Review: Consultation with neuro-oncology, neurosurgery, and radiation oncology for staging and treatment strategy.

4. Follow-up Protocol: MRI with contrast at 6–12 weeks post-treatment or if neurological symptoms worsen.

5. Treatment Considerations: Initiation of adjuvant radiation therapy and chemotherapy (e.g., temozolomide) is likely indicated based on tumor characteristics and location.

TECHNICAL NOTES

• Image Quality: Adequate for diagnostic interpretation

• Segmentation Confidence: High automated detection accuracy

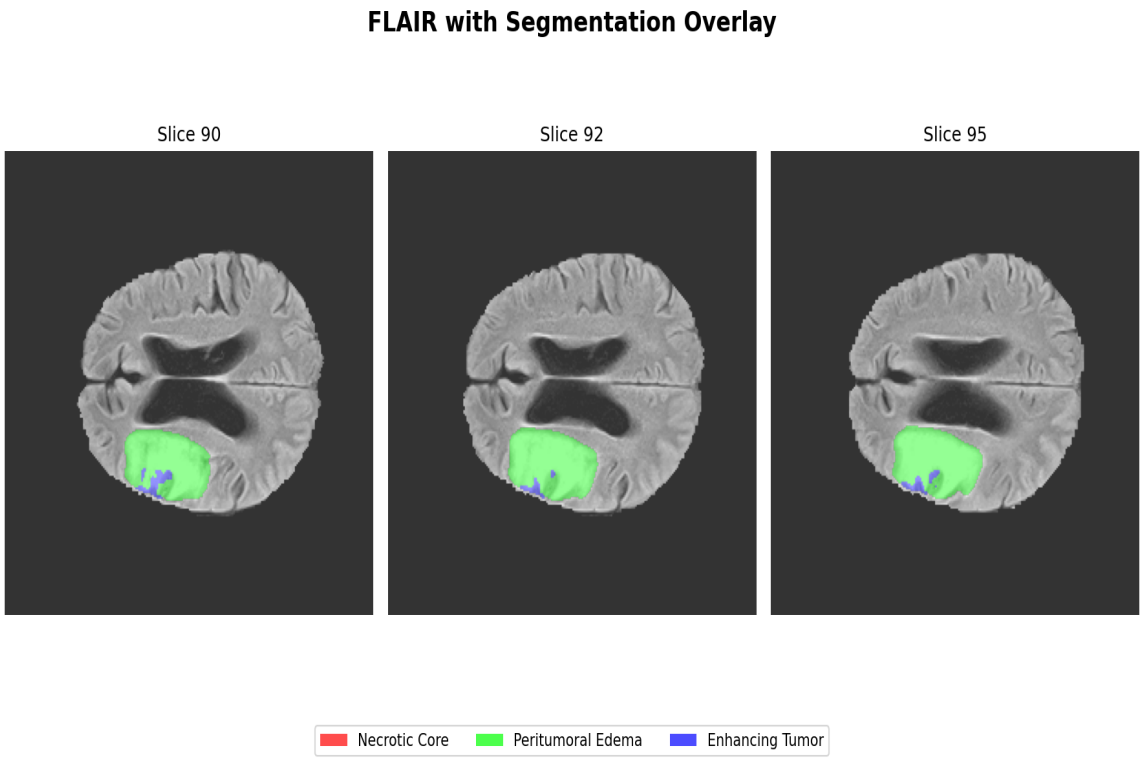
• Limitations: Standard limitations of MRI-based analysis include potential overestimation of edema and underestimation of subtle enhancement in low-grade lesions. Functional and molecular imaging may be required for definitive characterization.

Report Generated: September 19, 2025 at 07:57 AM

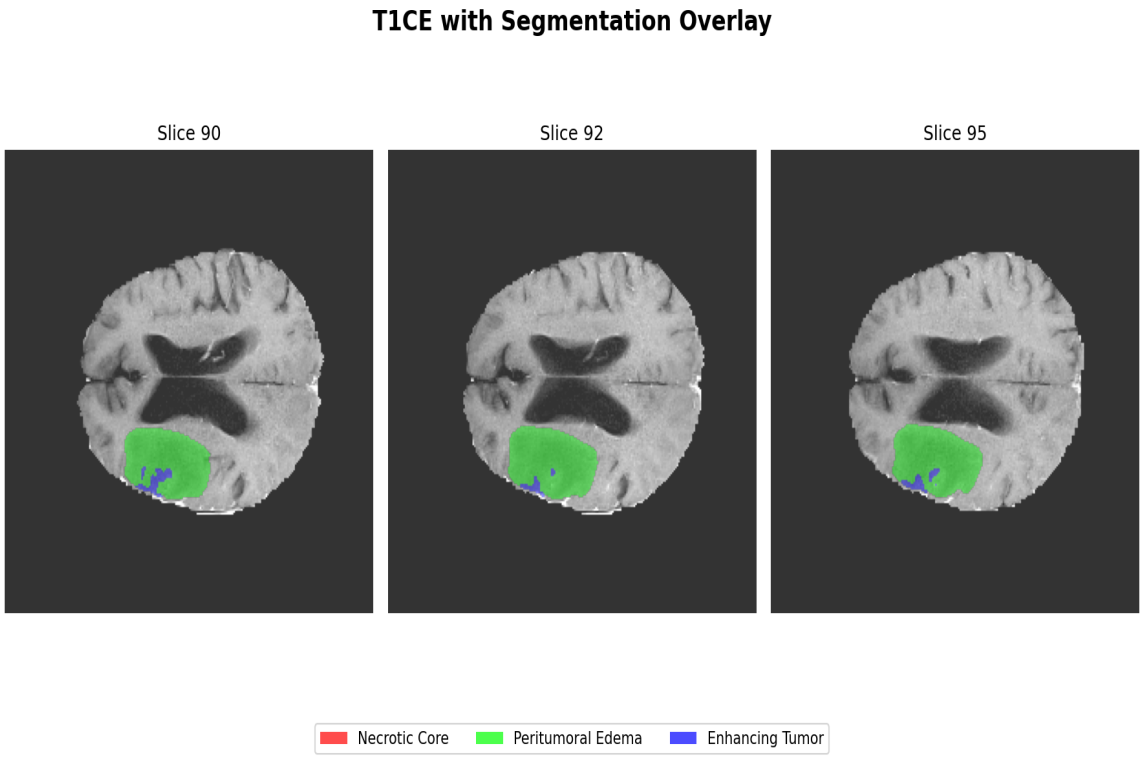
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

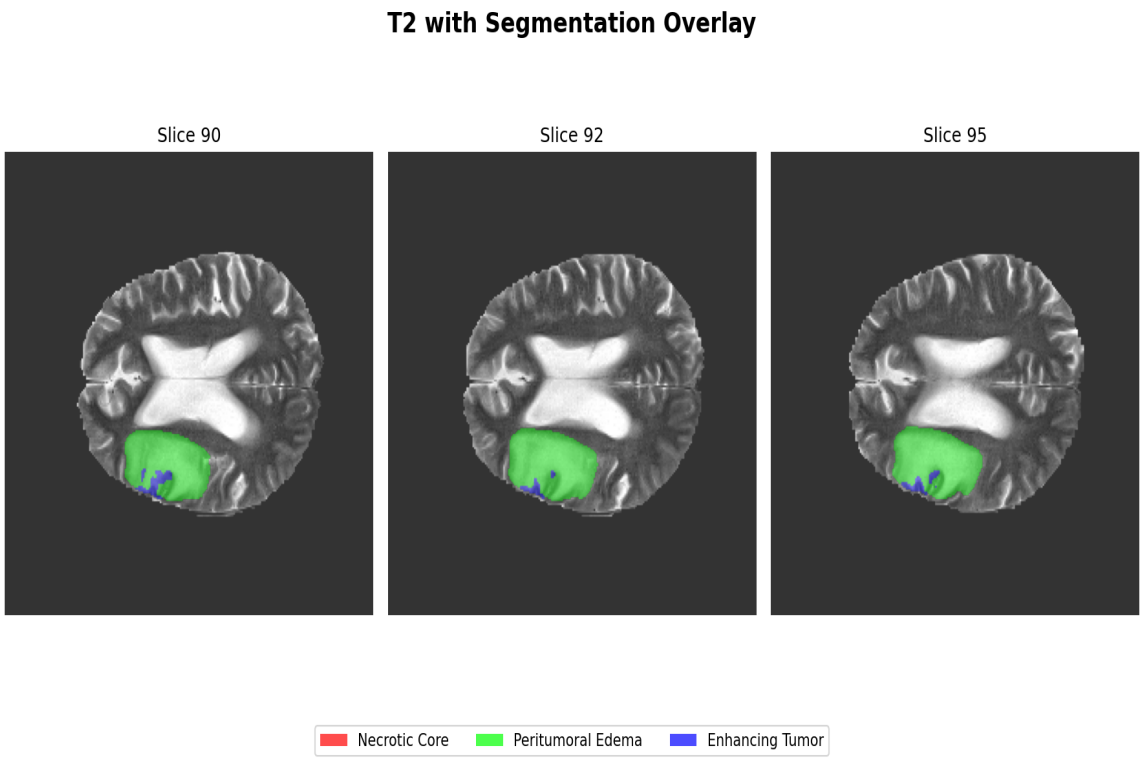
FLAIR Segmentation Overlay



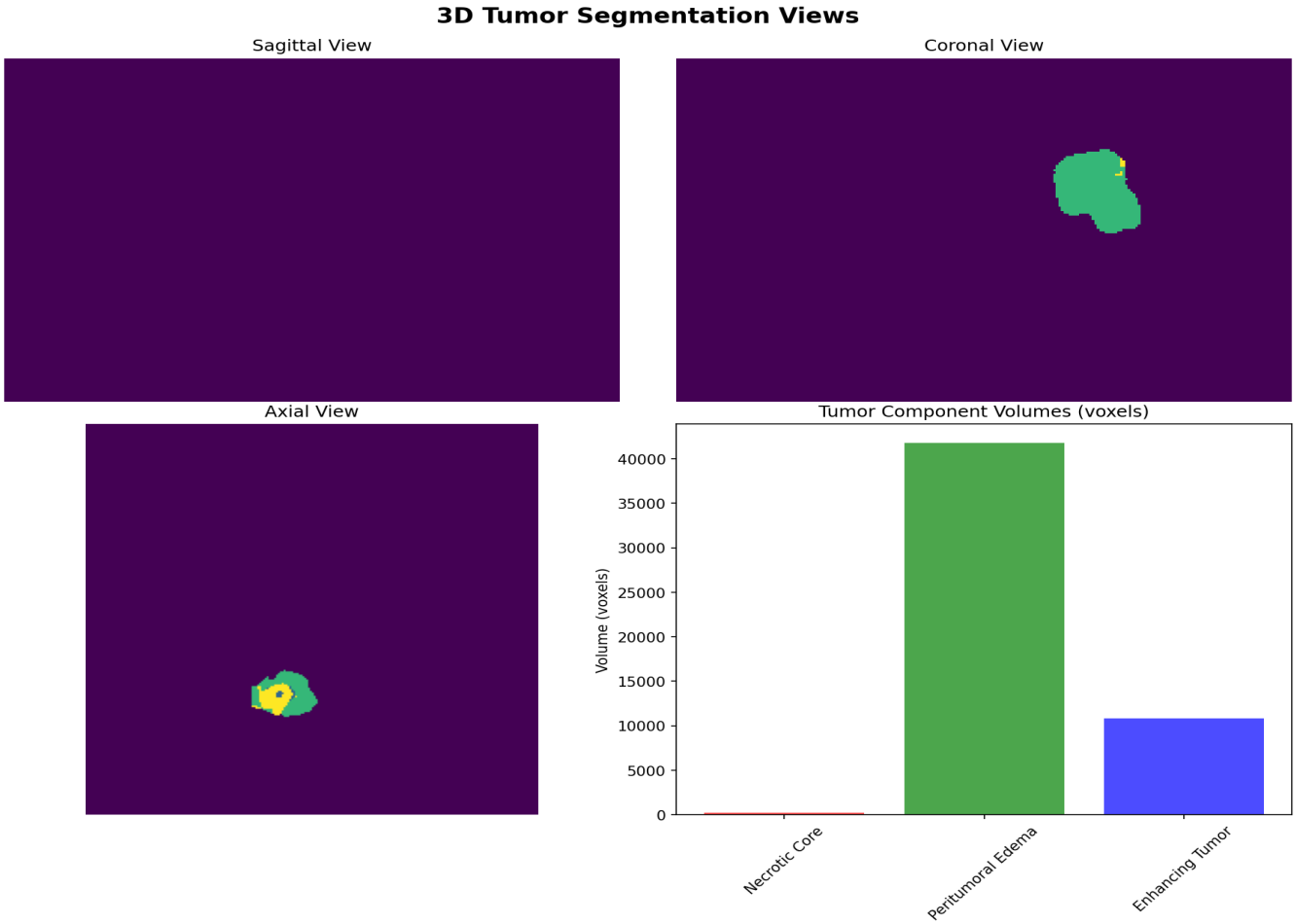
T1CE Segmentation Overlay



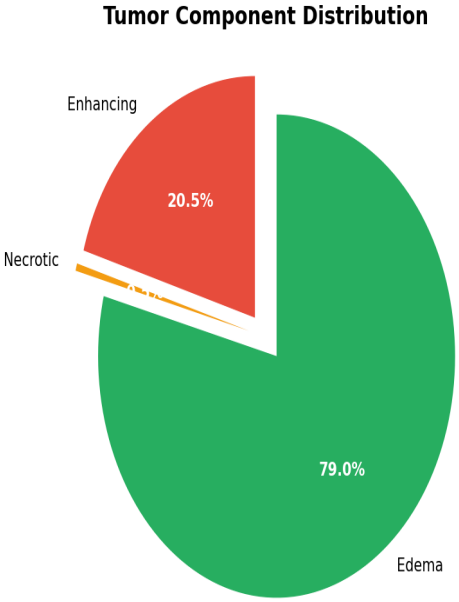
T2 Segmentation Overlay

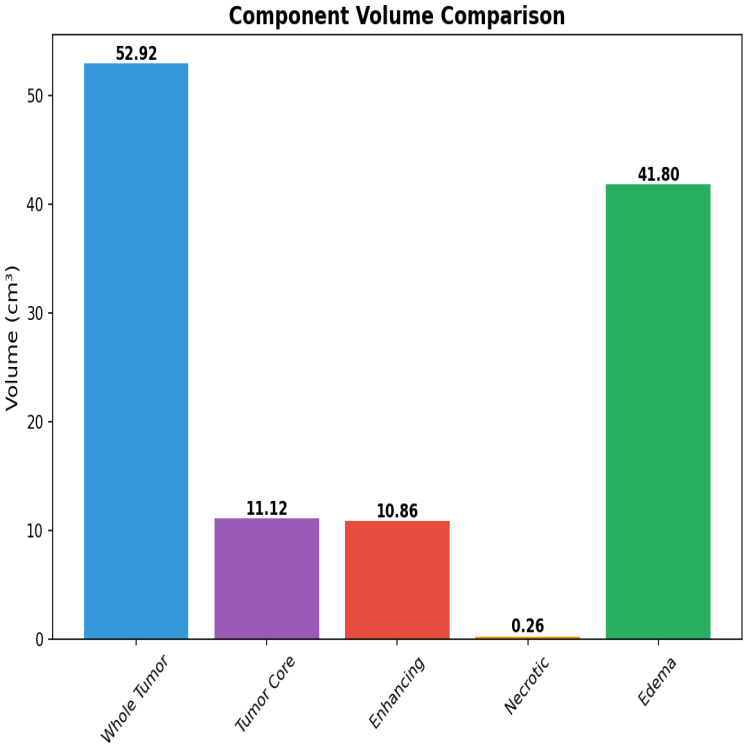


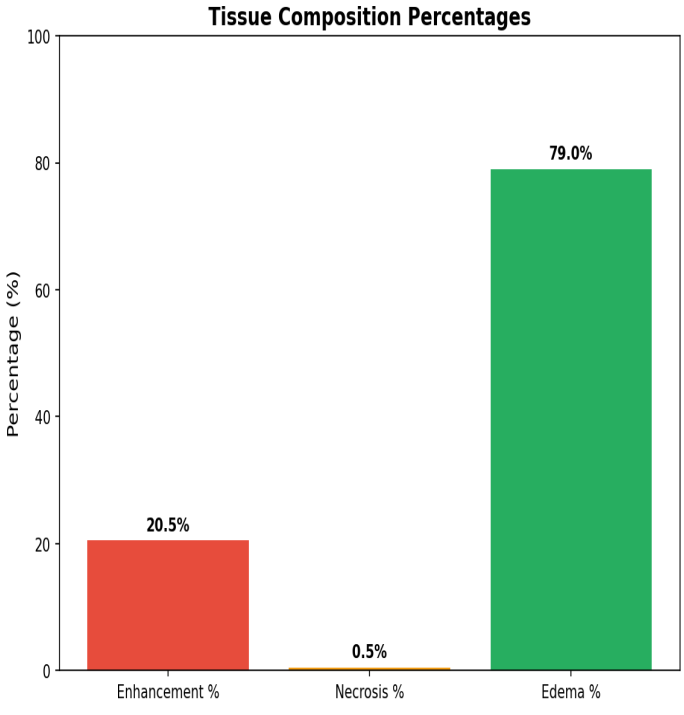
3D Volume Analysis

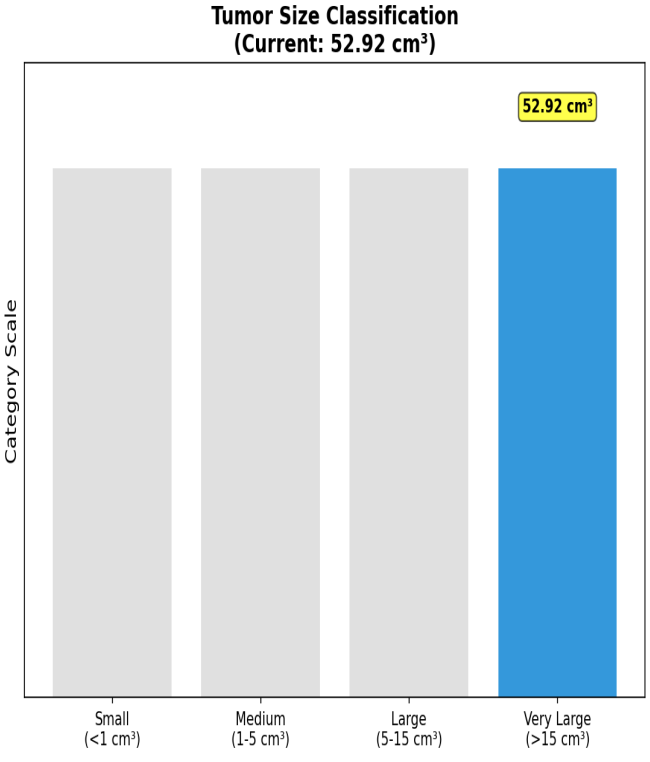

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 19, 2025 at 07:57 AM using Qwen/Qwen3-Coder-30B-A3B-Instruct.