BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-19T07:39:49.940643
Case ID	case_fcd5b916-90de-4e1e-815e-406b67295b8c

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

A large right-sided brain tumor with central location is identified, measuring 52.92 cm³ in total volume. The tumor demonstrates moderate enhancement and minimal necrosis, with significant surrounding edema. Imaging findings suggest a high-grade glioma or anaplastic astrocytoma, warranting urgent multidisciplinary evaluation and potential biopsy for histopathologic confirmation.

TUMOR MORPHOLOGY AND LOCATION

- **Location**: Right hemisphere, central brain region
- **Size Classification**: Very large (>15 cm³)
- **Maximum Diameter**: 62.0 mm
- **Anatomical Considerations**: The central location in the right hemisphere raises concern for potential involvement of critical motor and sensory pathways, necessitating careful pre-surgical planning and functional imaging to assess risk of neurological deficits.

QUANTITATIVE ANALYSIS

- **Total Tumor Volume**: 52.92 cm³
- **Tumor Core Volume**: 11.12 cm³
- **Enhancing Component**: 10.86 cm³ (20.5%)
- **Necrotic Component**: 0.26 cm³ (0.5%)
- **Edematous Component**: 41.80 cm³ (79.0%)

ENHANCEMENT CHARACTERISTICS

- **Enhancement Pattern**: Moderate (10–30%)
- **Enhancement Intensity**: Mean 520.73, Maximum 1146.00
- **Clinical Significance**: Moderate enhancement is consistent with high-grade glioma or anaplastic astrocytoma, suggesting active tumor proliferation and possible blood-brain barrier disruption. The relatively low necrotic component indicates a predominantly viable tumor mass.

TISSUE COMPOSITION ANALYSIS

Clinical Interpretation

Enhancing Tissue
Indicates active tumor proliferation and possible blood-brain barrier disruption.

Necrotic Core
Minimal necrosis suggests relatively well-perfused tumor tissue; less common in low-grade
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Peritumoral Edema

| Tissue Component | Presence

Present

Present

Present | Extensive edema supports a high-grade lesion and may contribute to mass effect and symptoms. |

CLINICAL ASSESSMENT

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

• **Differential Diagnosis**: Likely primary brain tumor such as glioblastoma multiforme or anaplastic astrocytoma, with possible metastasis if patient history suggests prior malignancy.

• **Prognosis Indicators**: The presence of significant edema and moderate enhancement, along with large tumor volume, suggests a more aggressive tumor behavior. However, the minimal necrosis and absence of extensive hemorrhage may support a more favorable prognosis if treated early.

RECOMMENDATIONS

1. **Immediate Actions**: Urgent neurological consultation and multidisciplinary tumor board review for treatment planning.

2. **Additional Imaging**: Consider perfusion MRI and MR spectroscopy to further characterize tissue composition and assess tumor heterogeneity.

3. **Multidisciplinary Review**: Involvement of neurosurgery, oncology, and radiation oncology for staging and treatment strategy.

4. **Follow-up Protocol**: MRI with contrast at 4–6 weeks post-treatment initiation, and as clinically indicated.

5. **Treatment Considerations**: Surgical resection (if feasible), followed by adjuvant radiation and chemotherapy, depending on histopathologic results.

TECHNICAL NOTES

• **Image Quality**: Adequate for diagnostic interpretation

• **Segmentation Confidence**: High automated detection accuracy

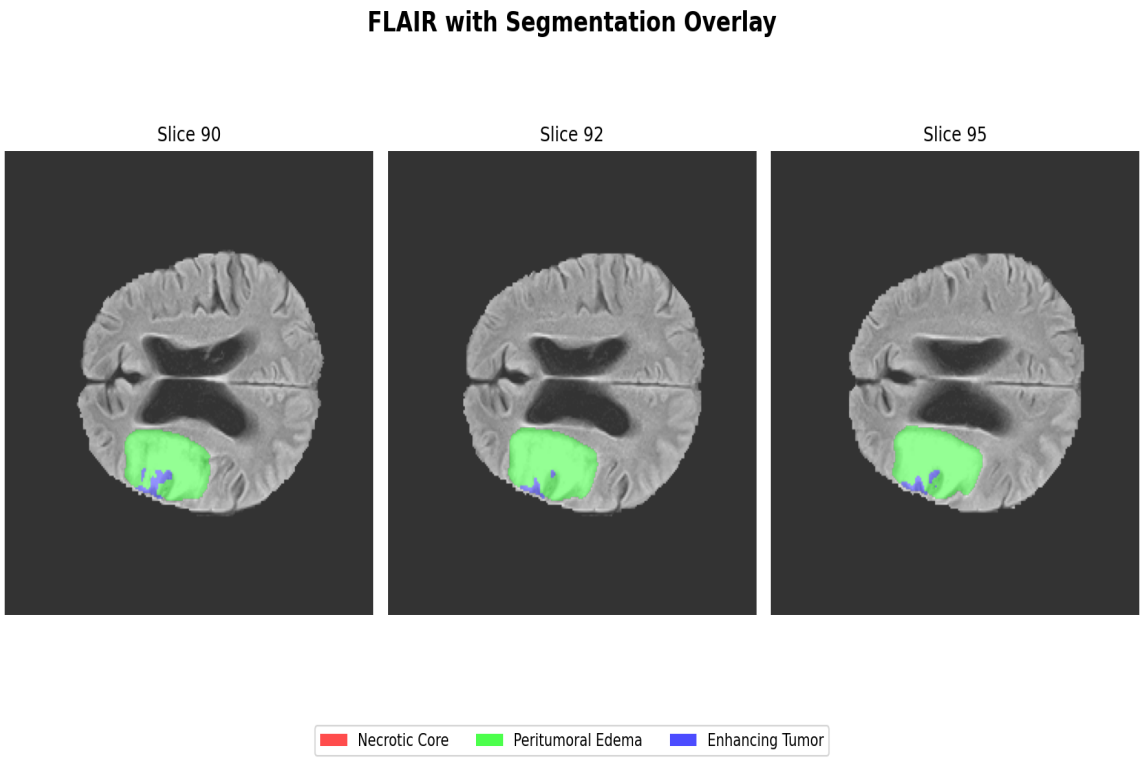
• **Limitations**: Standard limitations of MRI-based analysis include potential underestimation of infiltrative components and reliance on contrast enhancement for viability assessment.

Report Generated: September 19, 2025 at 07:39 AM

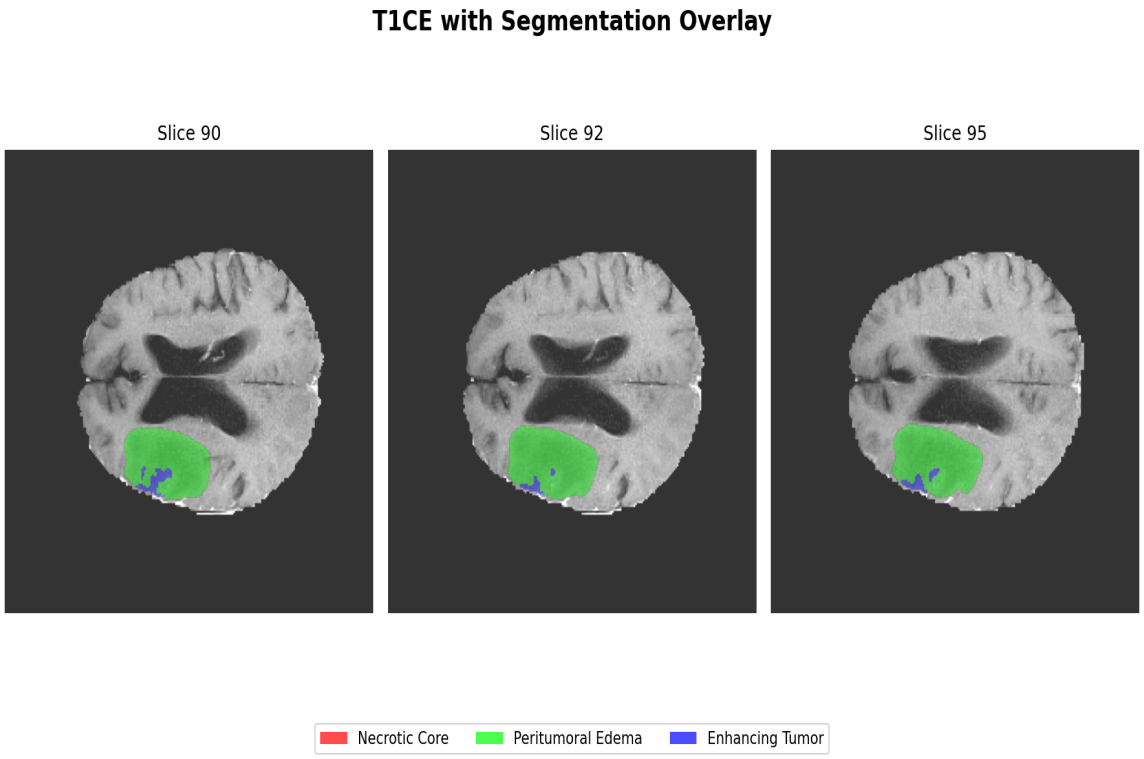
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

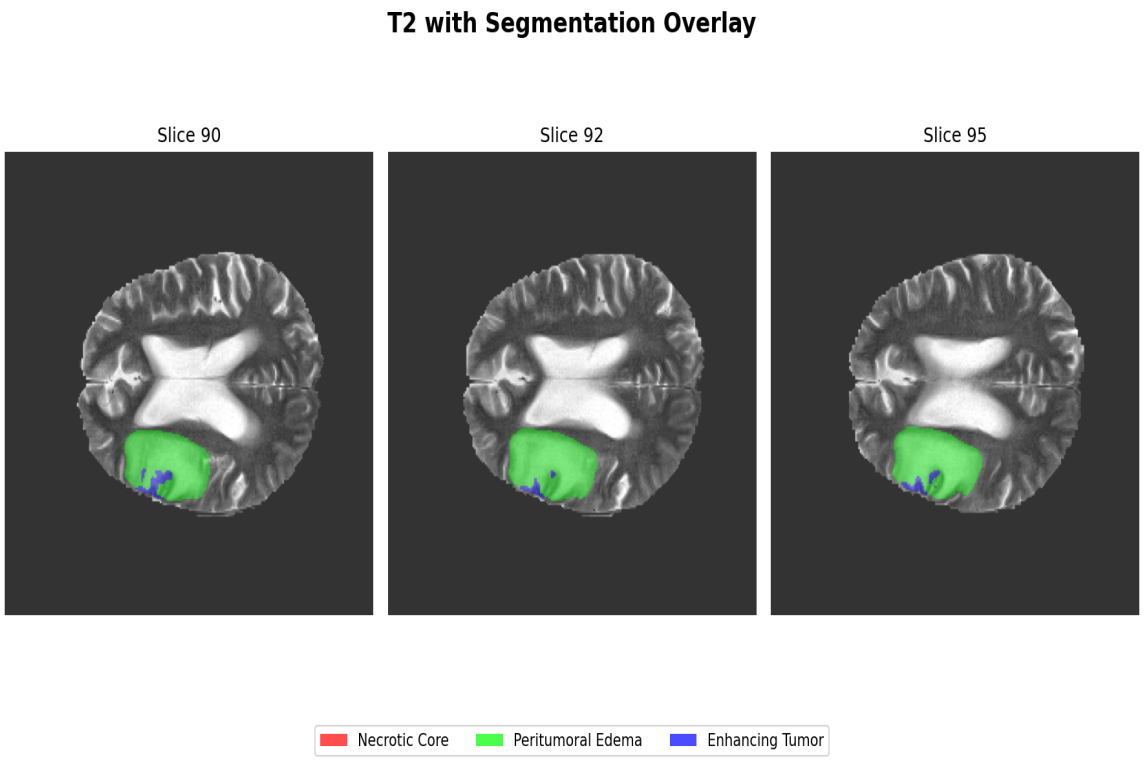
FLAIR Segmentation Overlay



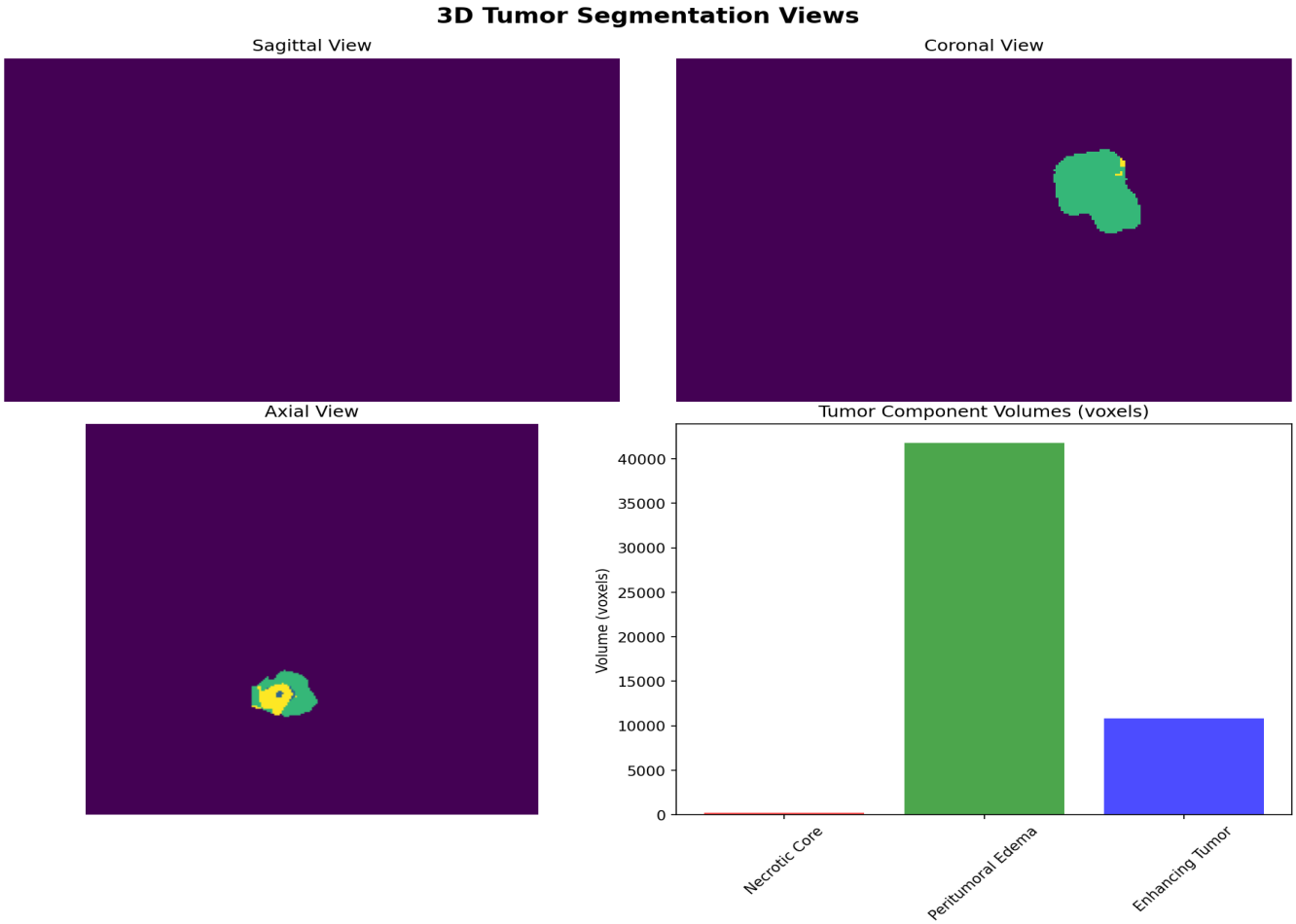
T1CE Segmentation Overlay



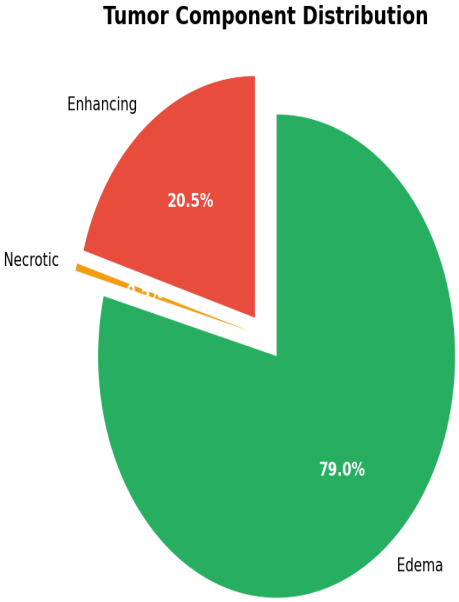
T2 Segmentation Overlay

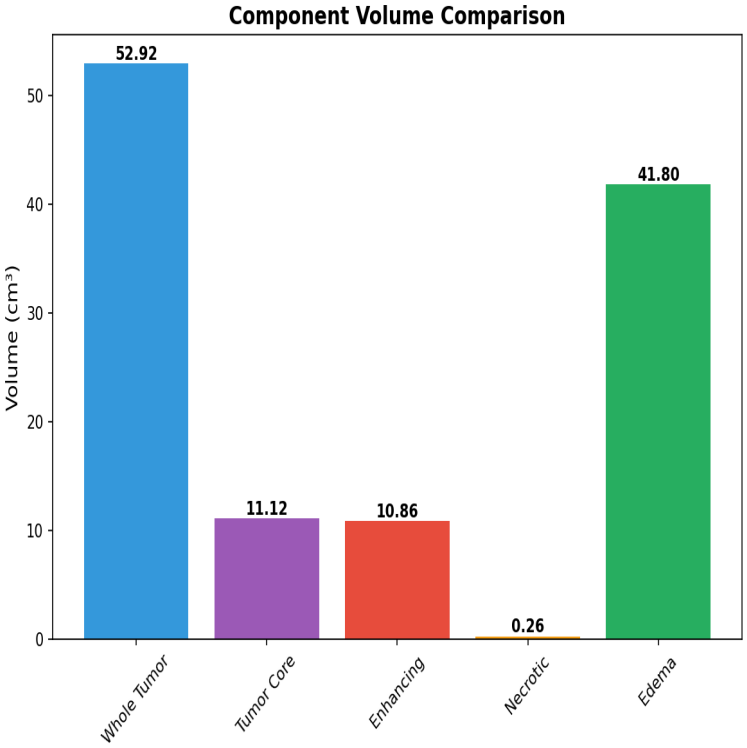


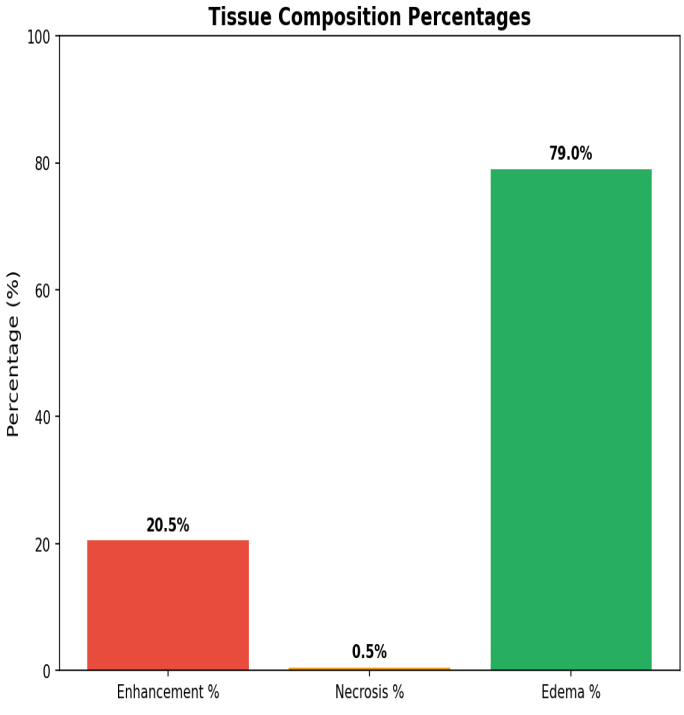
3D Volume Analysis

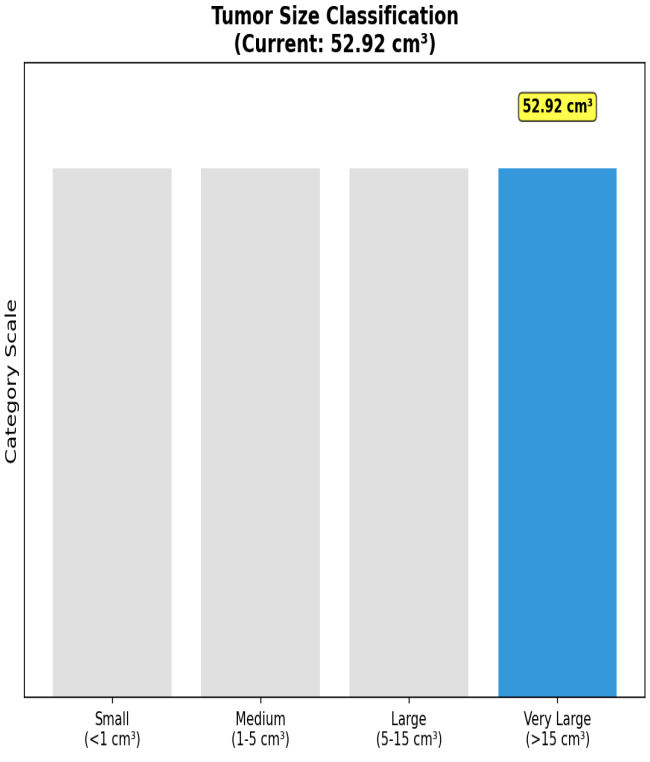

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 07:39 AM using Qwen/Qwen3-Coder-30B-A3B-Instruct.