BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-18T10:09:50.726017
Case ID	case_880b6556-bacf-419b-b6a1-a8a059cba2b2
Patient Id	321
Patient Age	22
Patient Gender	male

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case demonstrates a large right-sided central brain tumor with heterogeneous tissue composition, including a small necrotic component and significant peritumoral edema. The enhancing tumor volume represents approximately 20.5% of the total tumor volume, consistent with a moderately enhancing lesion. The presence of edema and focal necrosis, combined with the tumor's size and location, warrants urgent multidisciplinary evaluation and consideration of histopathological confirmation.

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 involve critical structures such as the corpus callosum, internal capsule, or adjacent white matter. This location can influence motor and cognitive function and may pose challenges for surgical resection and radiation planning.

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 high-grade glioma or other aggressive neoplasms. The presence of enhancement without significant rim enhancement may suggest a more diffuse infiltrative pattern or early treatment response.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Present/Absent | Clinical Interpretation |

|--|-||

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

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

| Peritumoral Edema | Present | Extensive edema (79%) is associated with significant mass effect and may indicate aggressive tumor behavior. |

CLINICAL ASSESSMENT

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

• Differential Diagnosis: Likely diagnosis includes glioblastoma multiforme (GBM), anaplastic astrocytoma, or oligodendroglioma with secondary changes. Other considerations include metastatic disease or lymphoma if clinical history supports.

• Prognosis Indicators: Extensive edema and large tumor volume are associated with poorer prognosis. The presence of minimal necrosis may suggest a more indolent histology, but further histopathological confirmation is essential.

RECOMMENDATIONS

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

2. Additional Imaging: Consider perfusion MRI and MR spectroscopy for further characterization.

3. Multidisciplinary Review: Involvement of neuro-oncology, radiation oncology, and neuropathology for comprehensive care.

4. Follow-up Protocol: MRI with contrast at 3–6 months post-intervention to assess treatment response.

5. Treatment Considerations: Consider surgical resection, followed by adjuvant radiation and chemotherapy based on histopathology 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 variability in enhancement patterns. Functional imaging modalities may be needed for further differentiation.

Report Generated: September 18, 2025 at 10:09 AM

System: AI-Assisted Brain Tumor Analysis Platform

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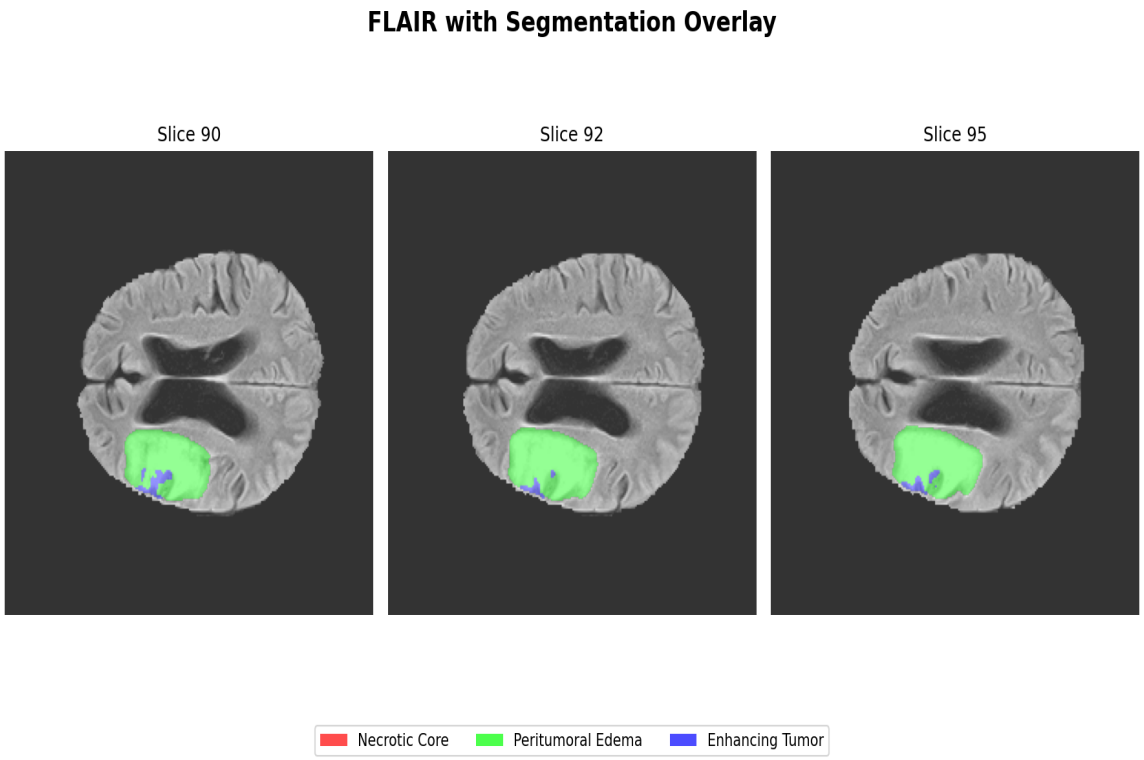
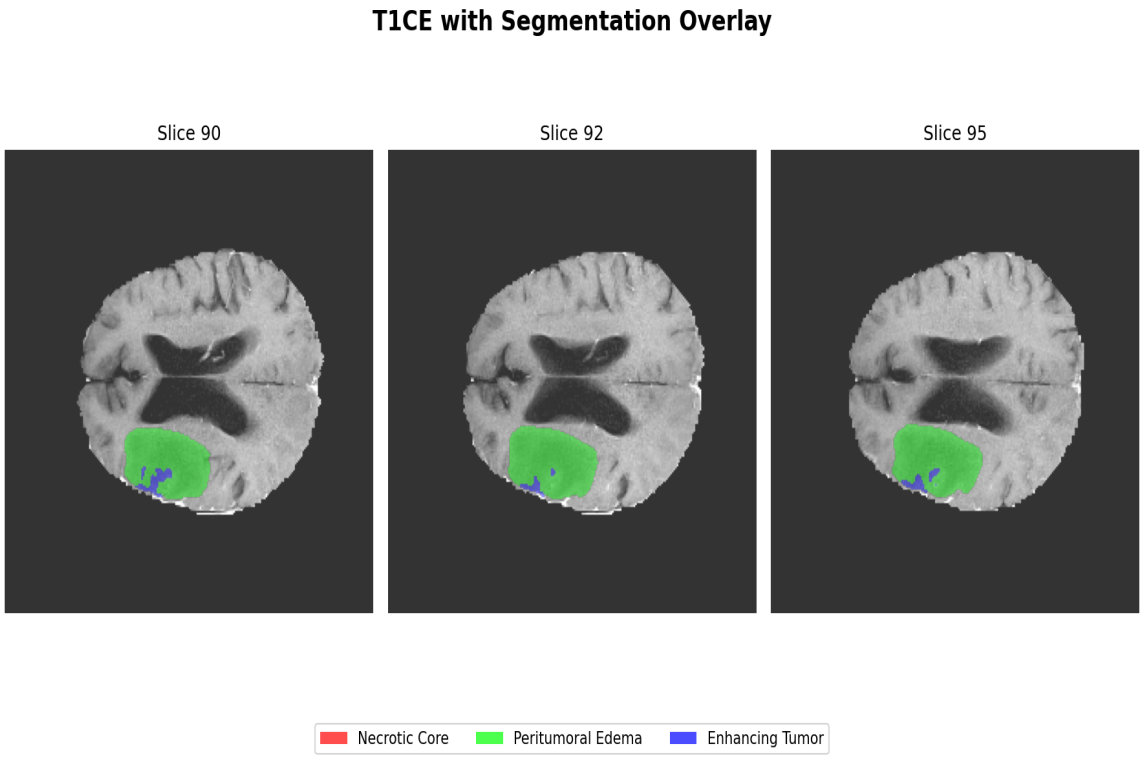
SEGMENTATION VISUALIZATIONS

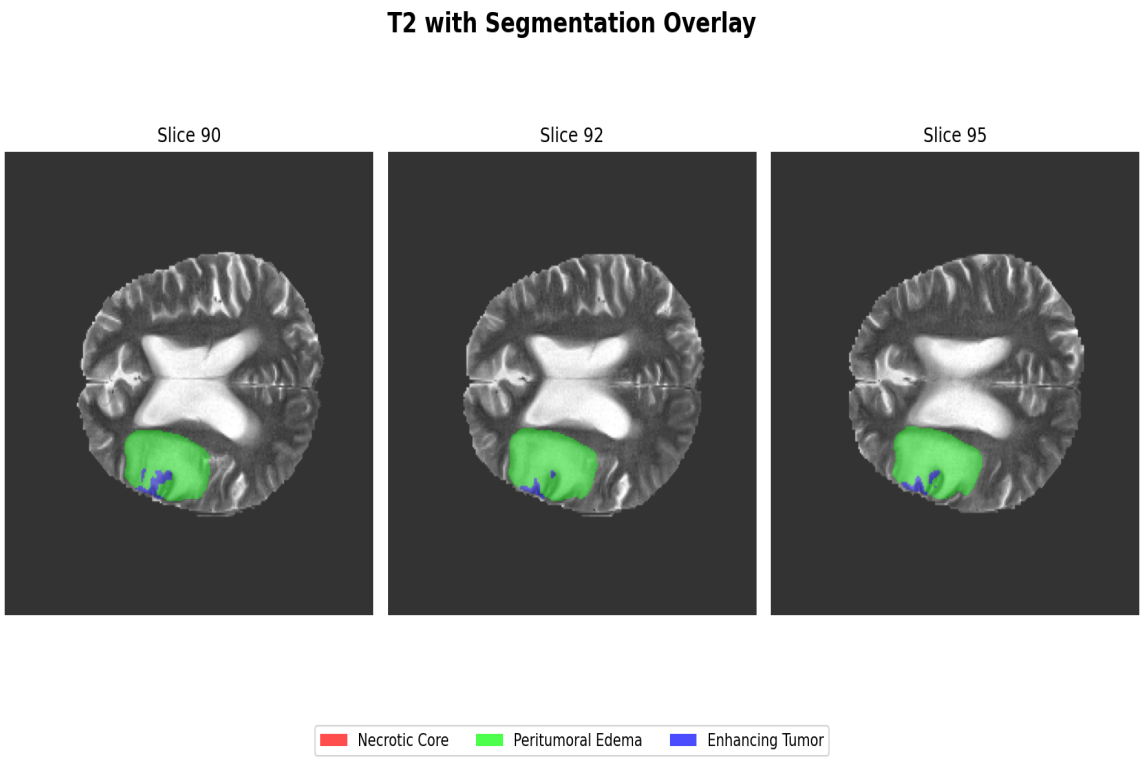
FLAIR Segmentation Overlay



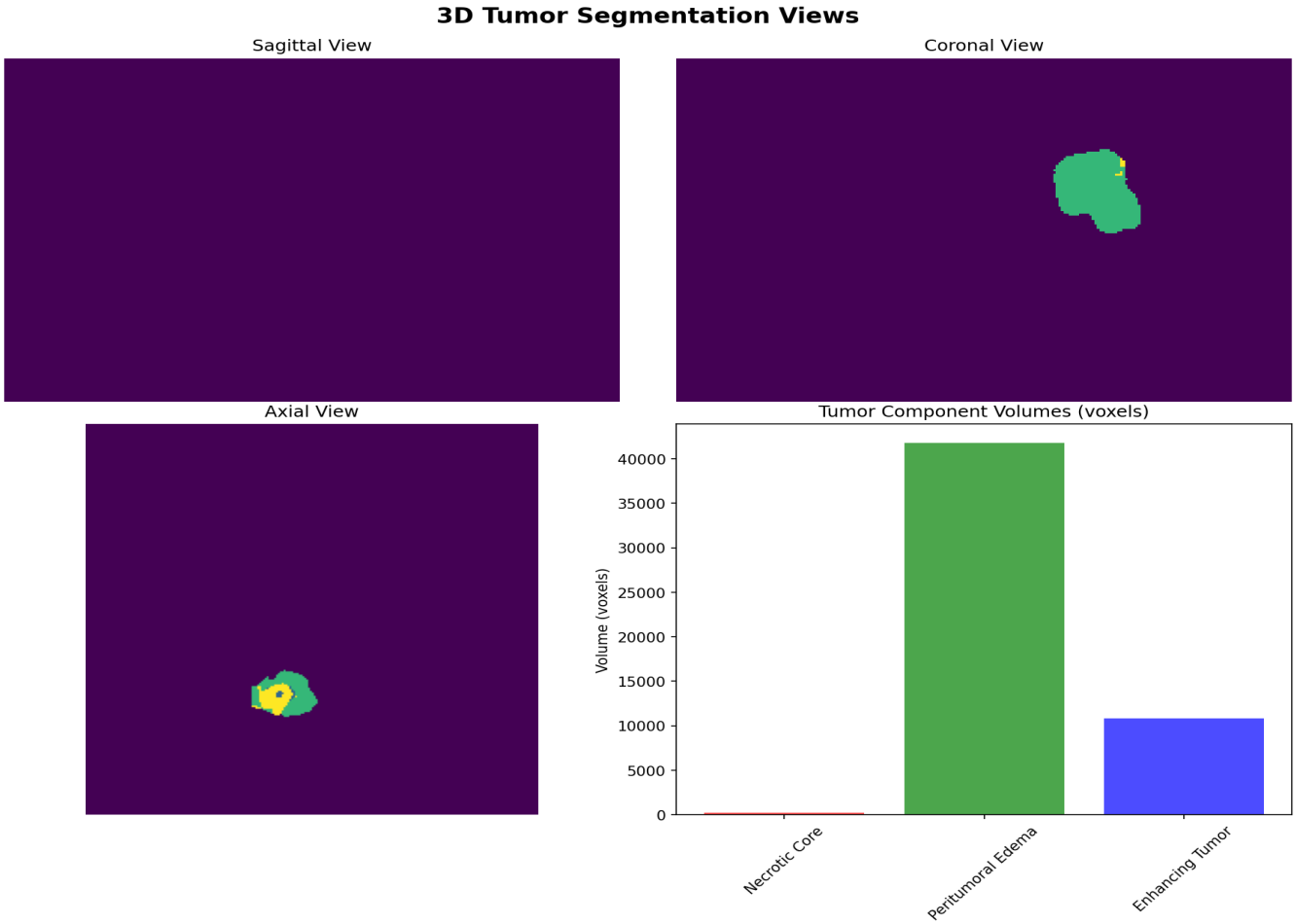
T1CE Segmentation Overlay



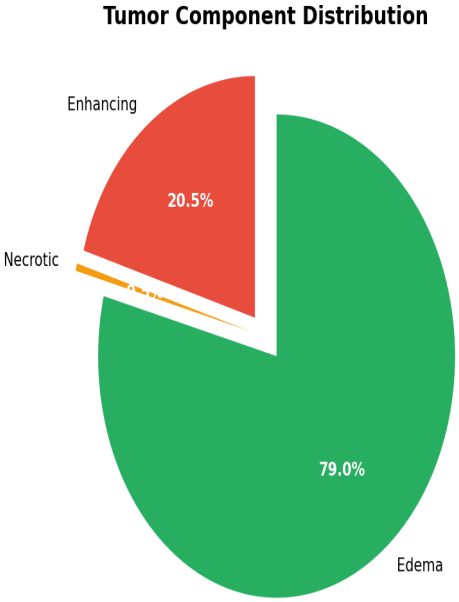
T2 Segmentation Overlay

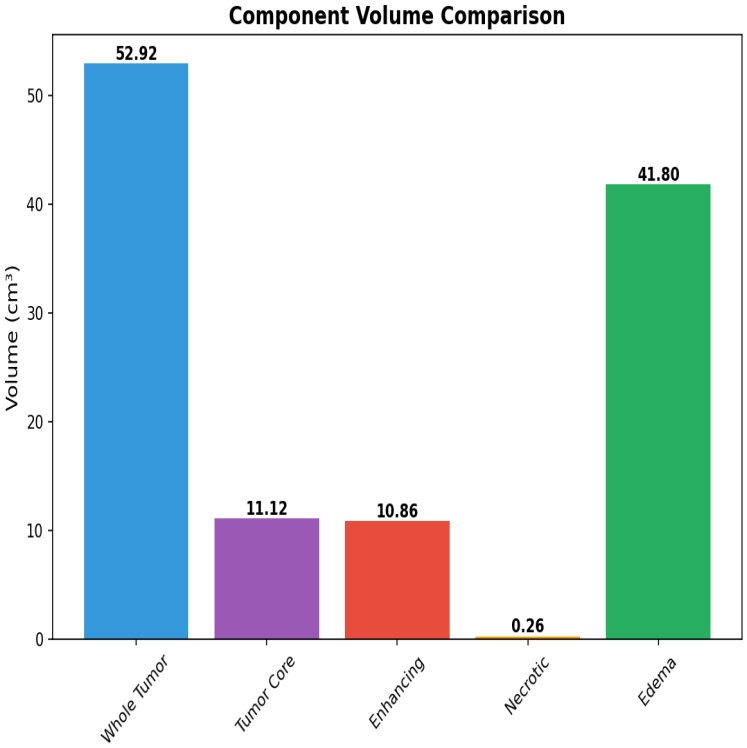


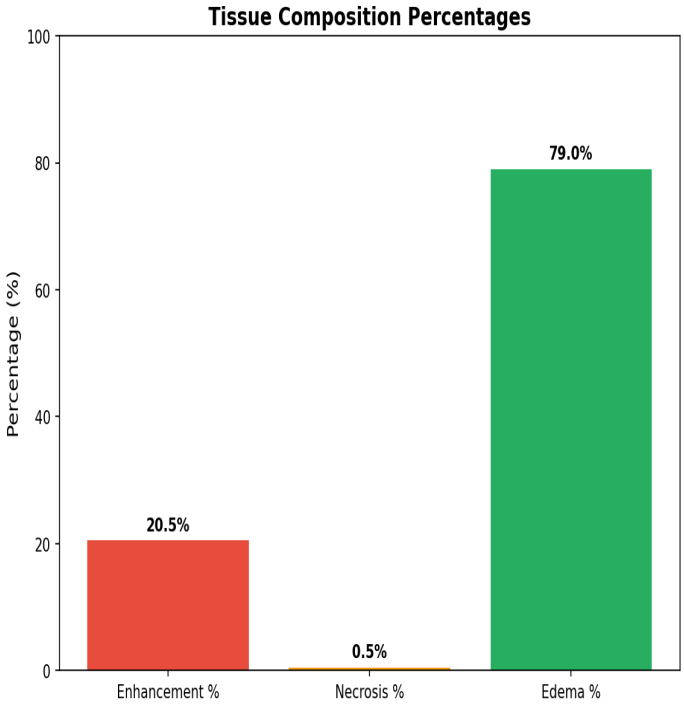
3D Volume Analysis

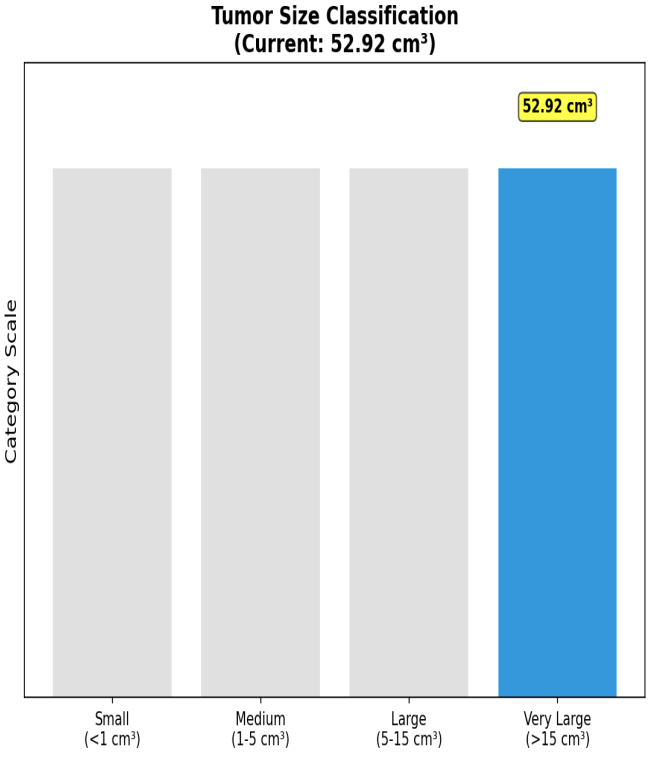

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 18, 2025 at 10:09 AM using microsoft/DialoGPT-medium.