BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T12:17:38.658770
Case ID	case_8d05718b-e15d-4d19-b7a6-a7d25195ffcd
Patient Id	213
Patient Age	22
Patient Gender	male

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

A large right-sided brain tumor with central location and moderate enhancement is identified. The lesion demonstrates significant peritumoral edema, minimal necrosis, and a moderate degree of enhancement, consistent with a high-grade glioma. This imaging profile necessitates urgent multidisciplinary evaluation for histopathological confirmation and treatment planning.

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 impact motor and sensory function, depending on the specific anatomical structures involved. Given the proximity to critical white matter tracts and cortical areas, surgical planning must consider functional preservation.

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 suggests active tumor proliferation with possible blood-brain barrier disruption. The presence of enhancement, combined with minimal necrosis, is consistent with a high-grade glioma, such as anaplastic astrocytoma or glioblastoma.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

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

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

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

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Moderate enhancement, extensive edema, minimal necrosis, and large tumor volume suggest a high-grade glioma (e.g., anaplastic astrocytoma or glioblastoma).

• Differential Diagnosis: Likely primary brain tumor such as glioblastoma multiforme (GBM), anaplastic astrocytoma, or oligodendroglioma. Further histopathological confirmation is essential.

• Prognosis Indicators: Large tumor size, presence of edema, and moderate enhancement are associated with a poorer prognosis. Early intervention and multidisciplinary management are critical.

RECOMMENDATIONS

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

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

3. Multidisciplinary Review: Involvement of neuro-oncology, radiation oncology, and neuropathology teams.

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

5. Treatment Considerations: Consider multimodal therapy including surgery, radiation, and chemotherapy based on histopathology results.

TECHNICAL NOTES

• Image Quality: Adequate for diagnostic interpretation

• Segmentation Confidence: High automated detection accuracy

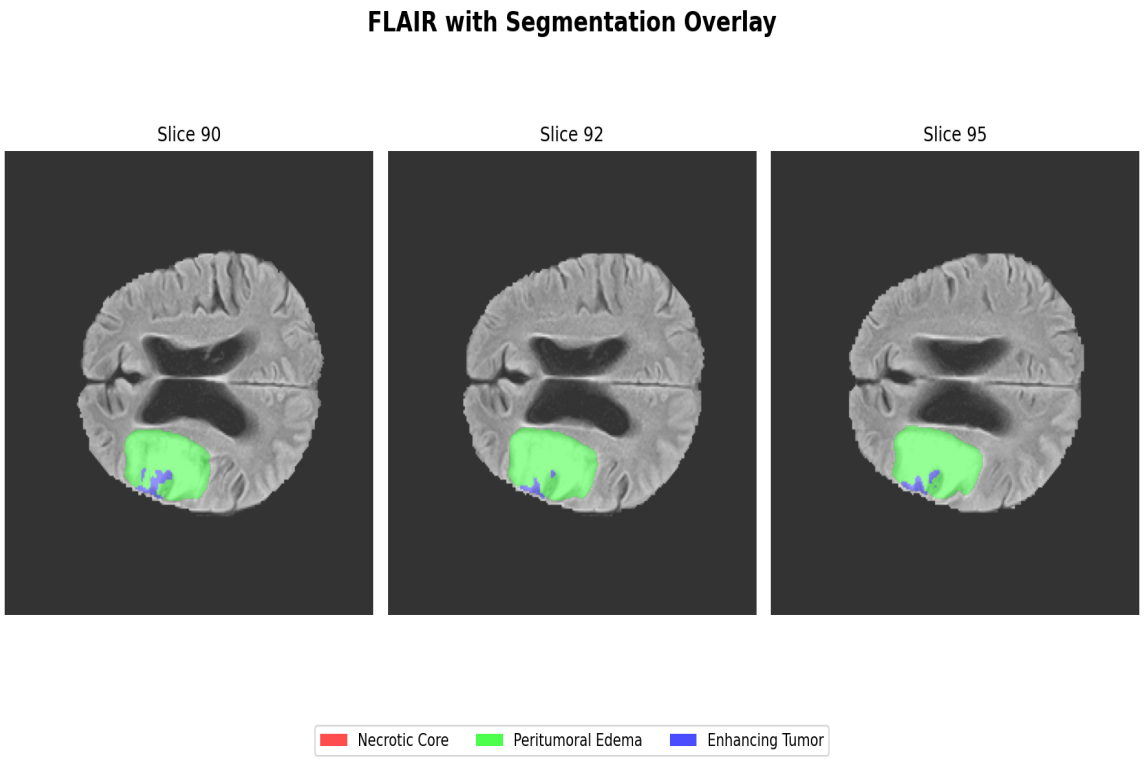
• Limitations: Standard limitations of MRI-based analysis include potential underestimation of small enhancing components and artifacts from motion or susceptibility.

Report Generated: September 17, 2025 at 12:17 PM

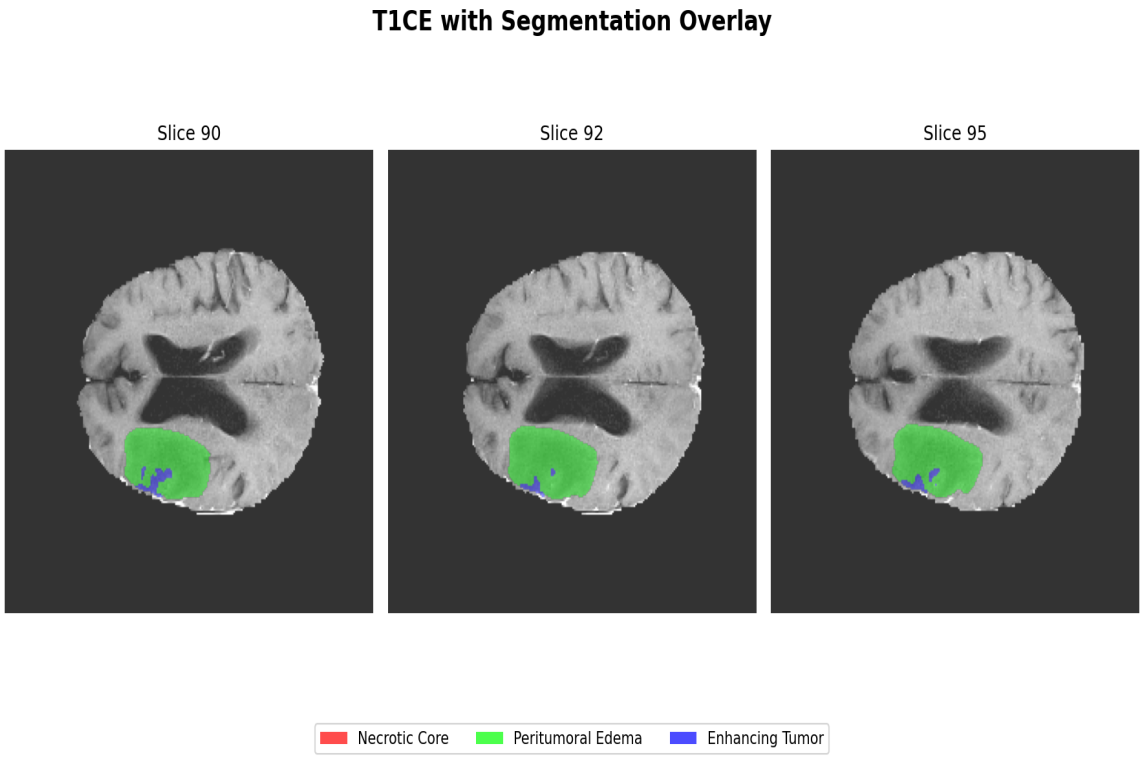
System: AI-Assisted Brain Tumor Analysis Platform

SEGMENTATION VISUALIZATIONS

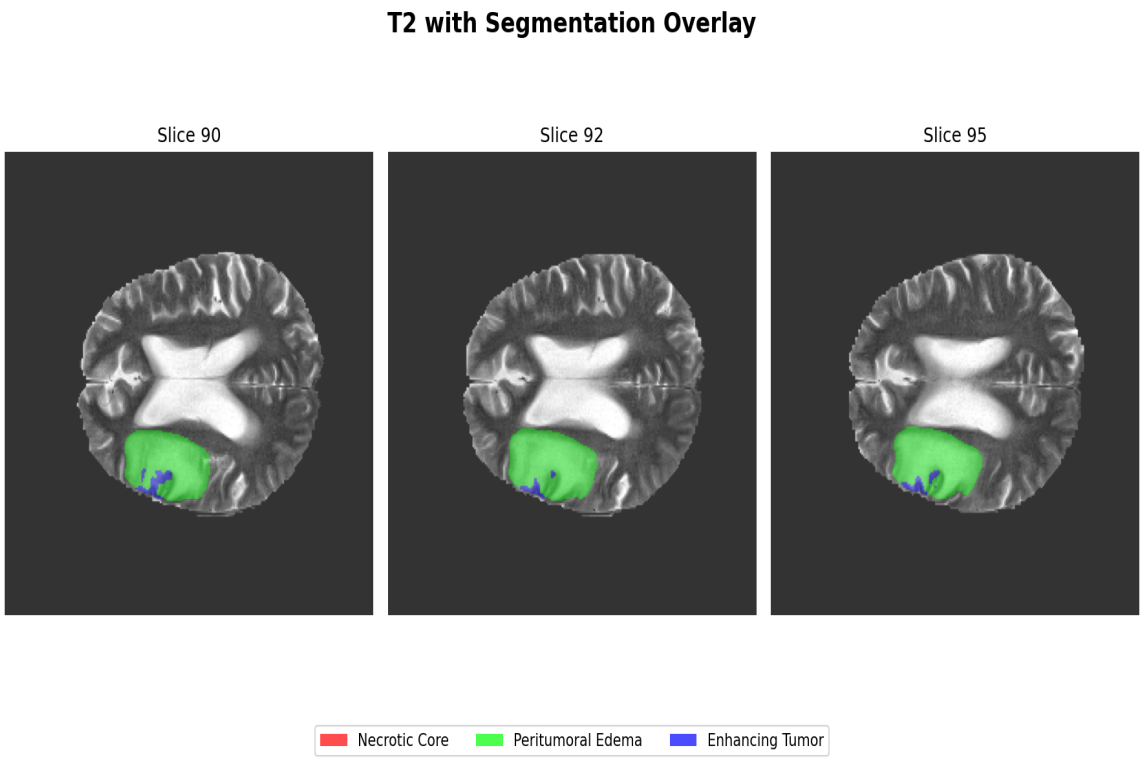
FLAIR Segmentation Overlay



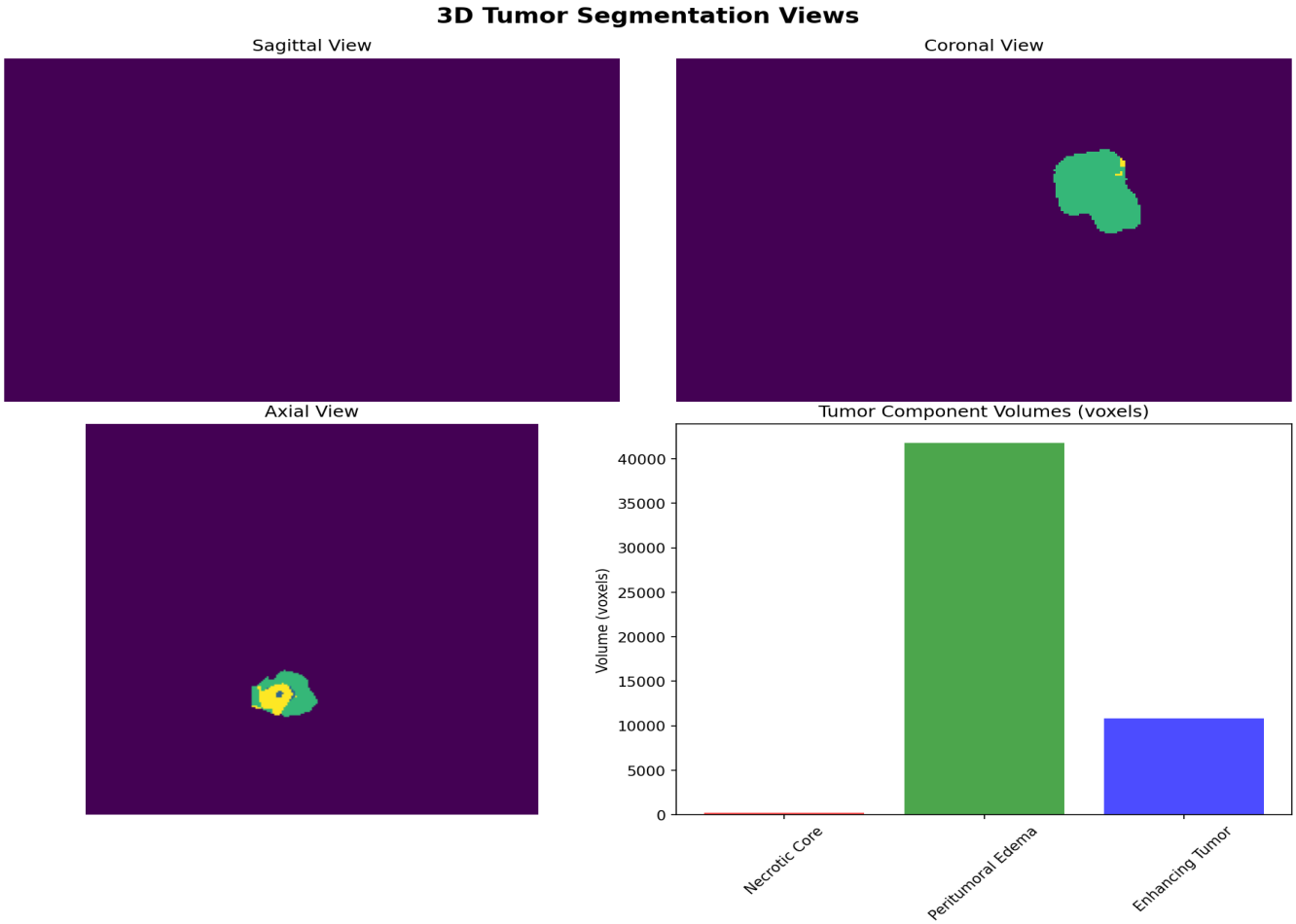
T1CE Segmentation Overlay



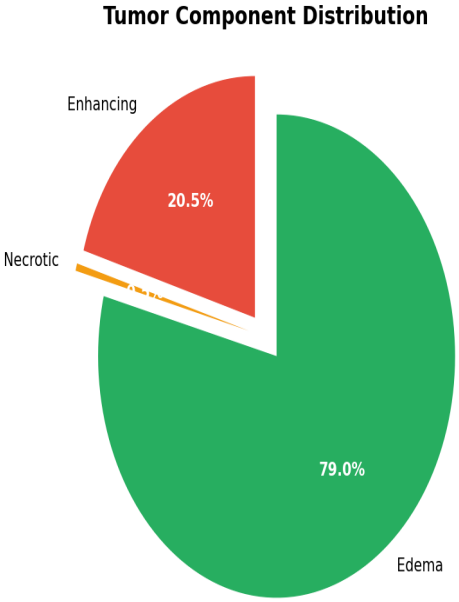
T2 Segmentation Overlay

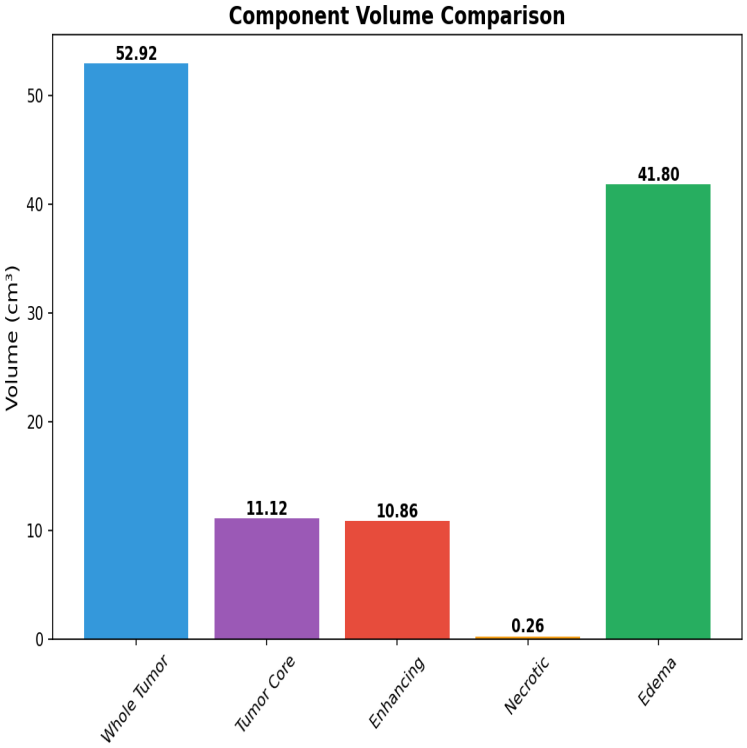


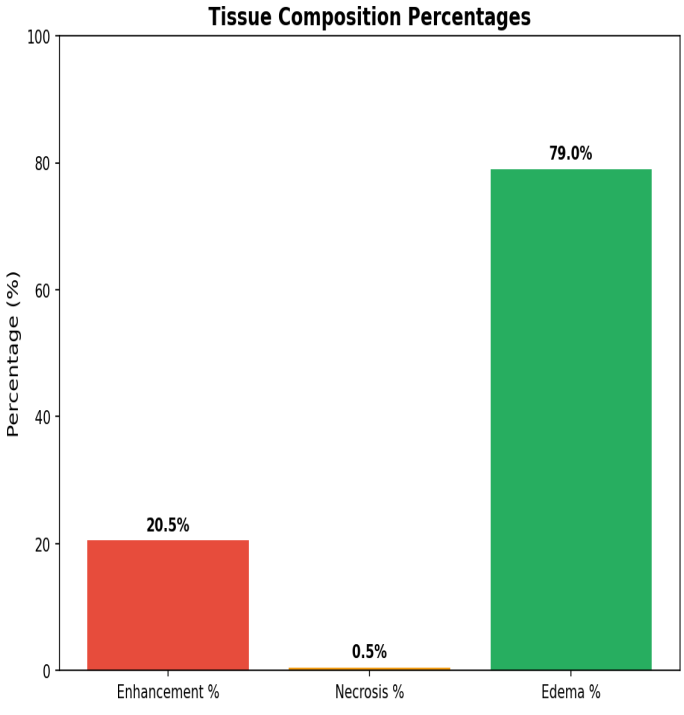
3D Volume Analysis

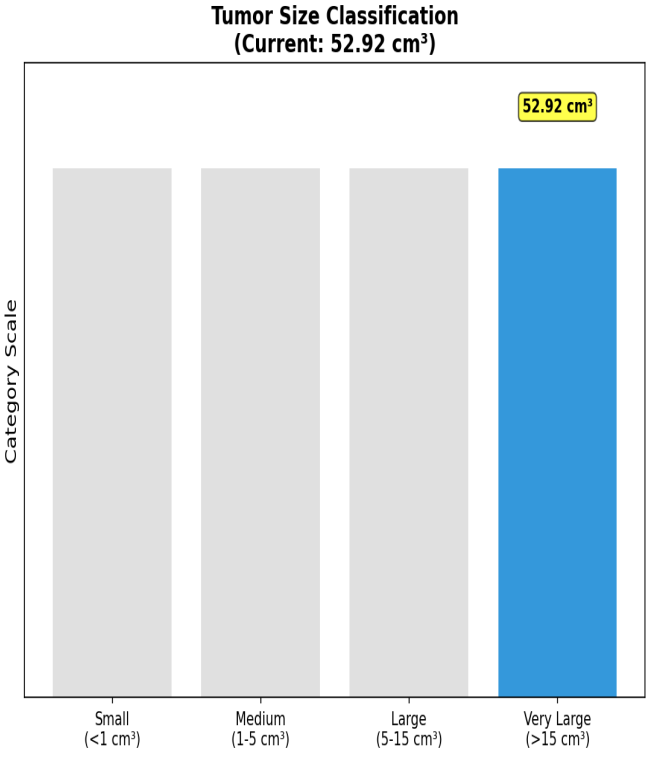

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 12:17 PM using microsoft/DialoGPT-medium.