BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-19T07:30:30.226677
Case ID	case_93c06efa-eb05-4b38-a992-56aea9ccbc0f
Patient Id	212
Patient Age	22
Patient Gender	female

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case represents a large right-sided central brain tumor with moderate enhancement and minimal necrosis, consistent with a high-grade glioma. The presence of significant peritumoral edema and a substantial enhancing component raises concern for aggressive tumor biology. Imaging findings support the need for urgent multidisciplinary evaluation and 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 impact motor and sensory functions, depending on the specific anatomical structures involved. Given its size and location, potential for mass effect and neurological deficits is significant.

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 absence of significant hyperintensity or washout patterns does not definitively exclude malignancy but indicates a more indolent or intermediate-grade process.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Presence | Clinical Interpretation |

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| Enhancing Tissue | Present | Indicates viable tumor tissue with active proliferation and/or vascular permeability. |

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

| Peritumoral Edema | Present | Extensive edema (79%) is consistent with high-grade glioma and suggests significant tumor-induced inflammation or vasogenic edema. |

CLINICAL ASSESSMENT

• Tumor Grade Indicators: Moderate enhancement, minimal necrosis, and extensive edema are consistent with anaplastic glioma or glioblastoma multiforme (GBM), though histology is required for definitive grading.

• Differential Diagnosis: Likely high-grade glioma (e.g., anaplastic astrocytoma or glioblastoma), with possibility of other infiltrative neoplasms such as oligodendroglioma with mixed features.

• Prognosis Indicators: Extensive edema and moderate enhancement suggest aggressive behavior; however, the low necrotic volume and absence of mass effect may indicate a less fulminant course. Early intervention and histopathological confirmation are critical.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurosurgical consultation for potential biopsy or resection; neurological assessment to evaluate functional deficits.

2. Additional Imaging: Consider perfusion MRI and spectroscopy to further characterize tissue viability and metabolic activity.

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

4. Follow-up Protocol: Serial MRI every 3 months post-intervention to monitor treatment response and detect recurrence.

5. Treatment Considerations: Based on imaging, consideration of surgical resection, followed by adjuvant radiation and chemotherapy (e.g., temozolomide), depending on histology.

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 tissue heterogeneity; correlation with clinical and histopathological findings is essential.

Report Generated: September 19, 2025 at 07:30 AM

System: AI-Assisted Brain Tumor Analysis Platform

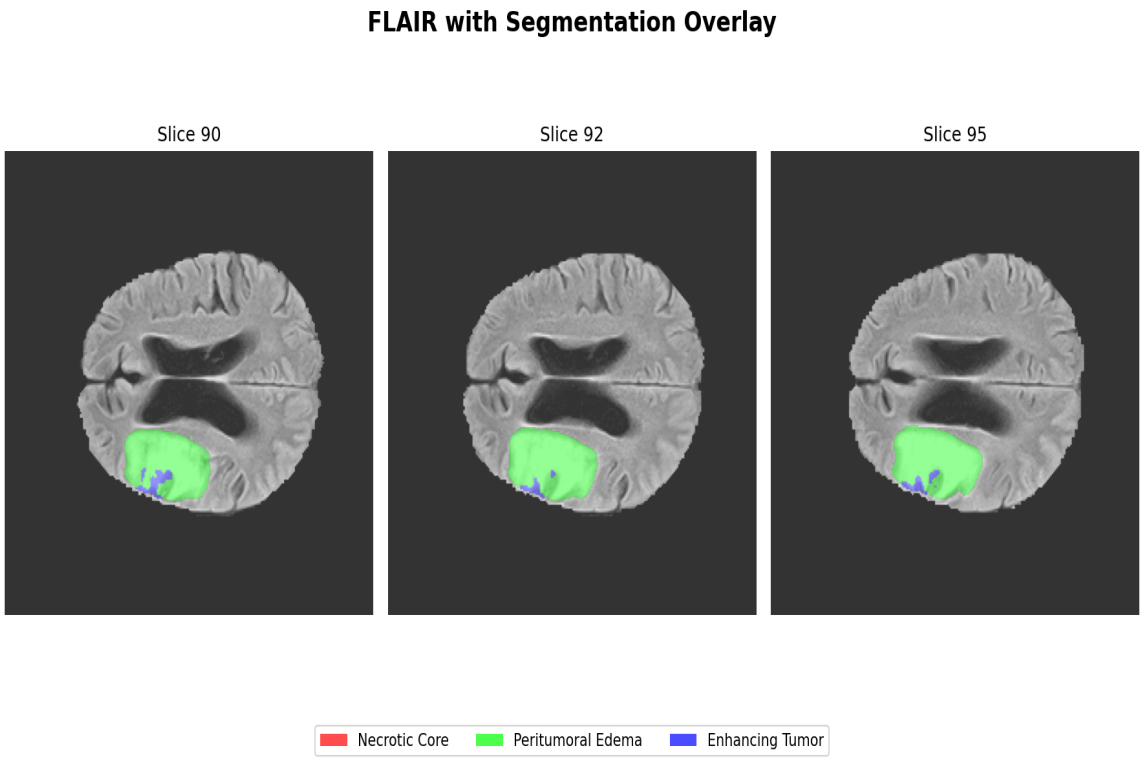
Case ID: case_93c06efa-eb05-4b38-a992-56aea9ccbc0f

Patient ID: 212

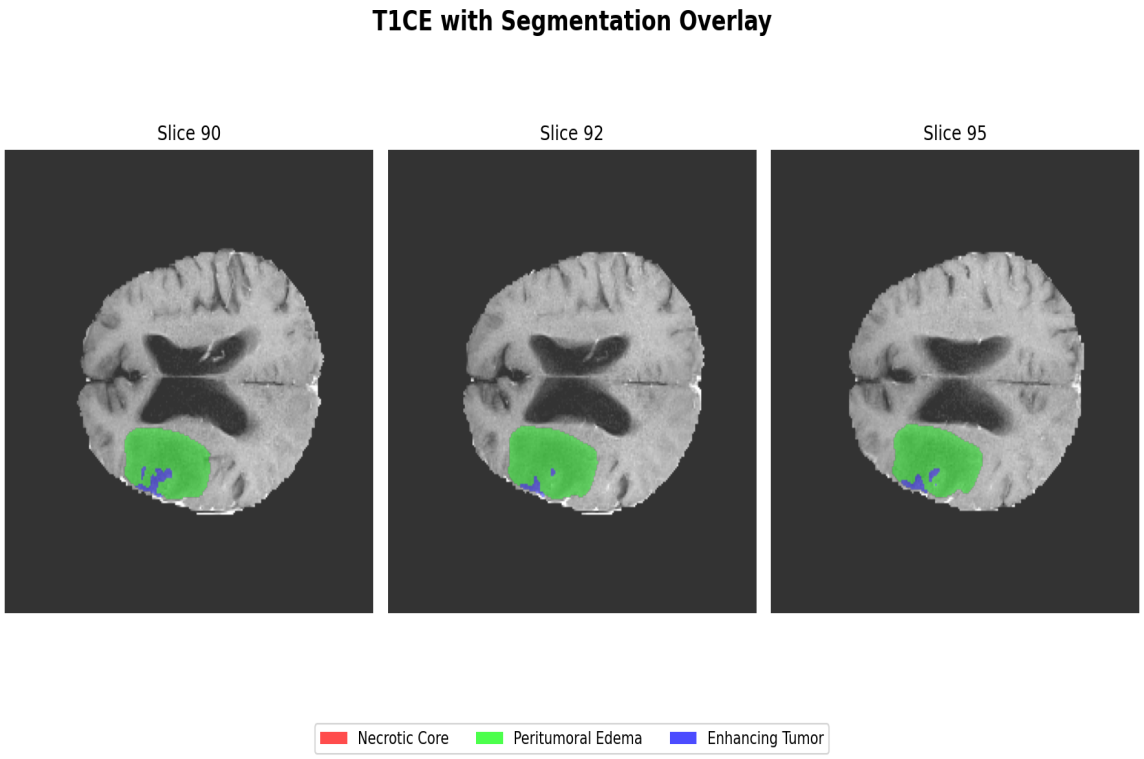
Age/Gender: 22 years / Female

SEGMENTATION VISUALIZATIONS

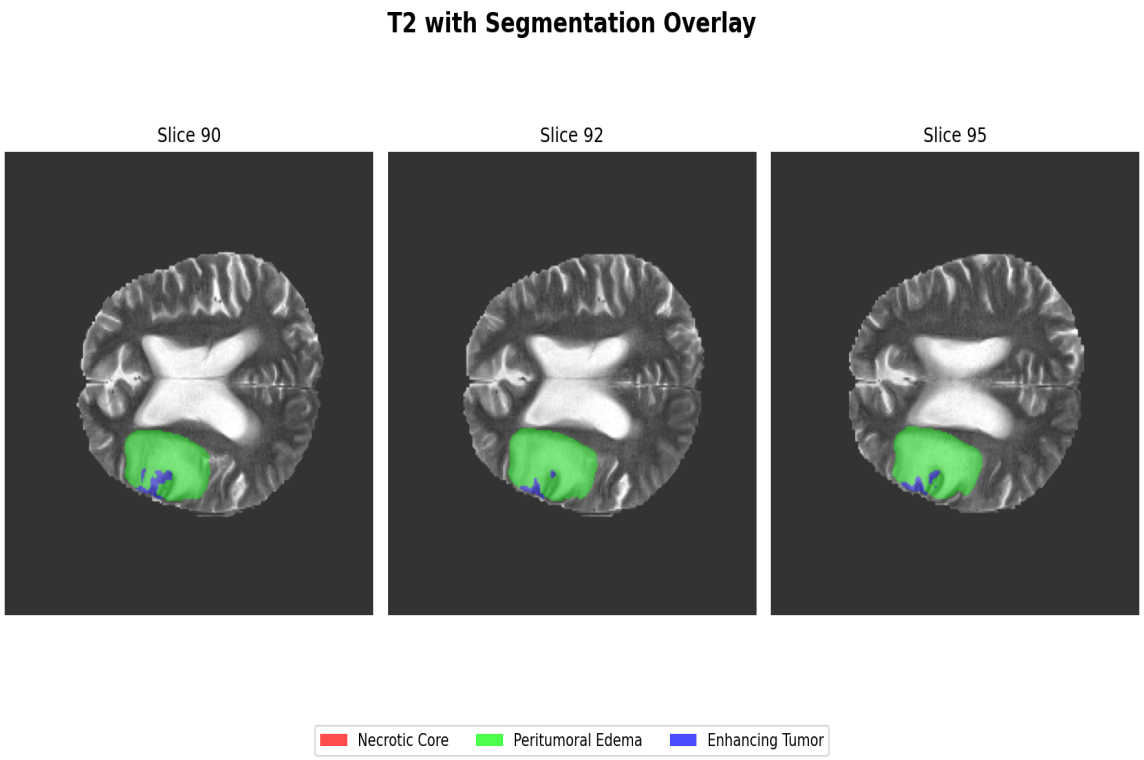
FLAIR Segmentation Overlay



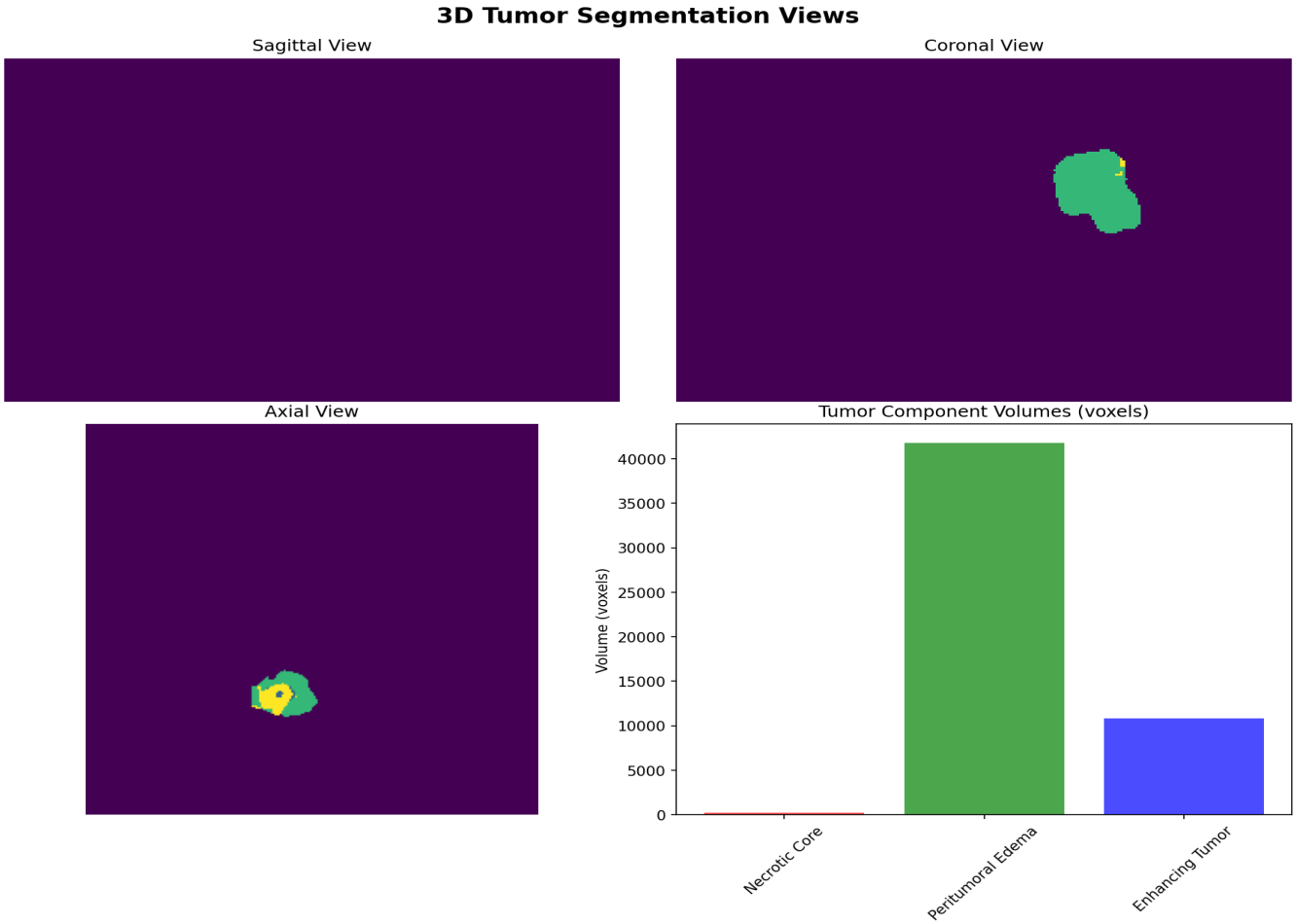
T1CE Segmentation Overlay



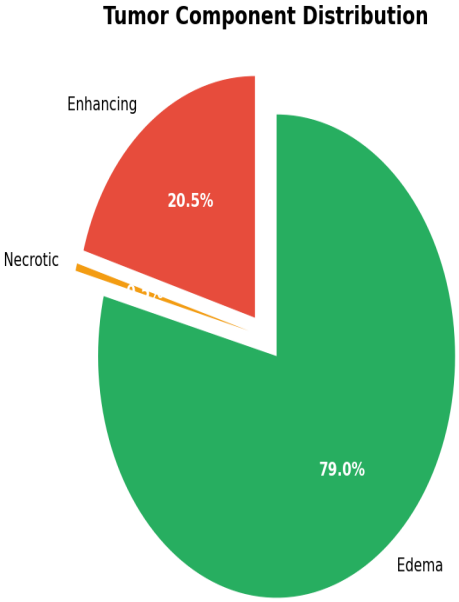
T2 Segmentation Overlay

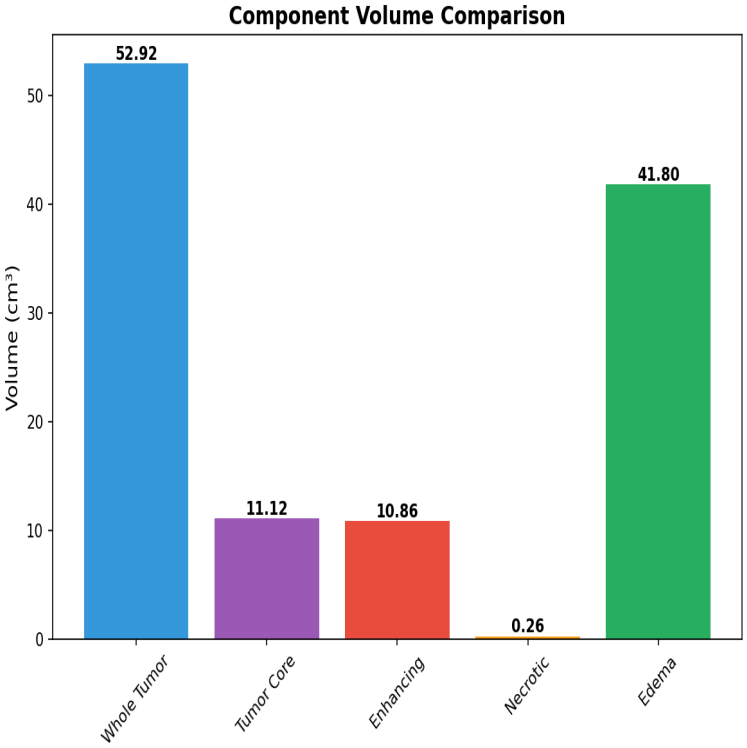


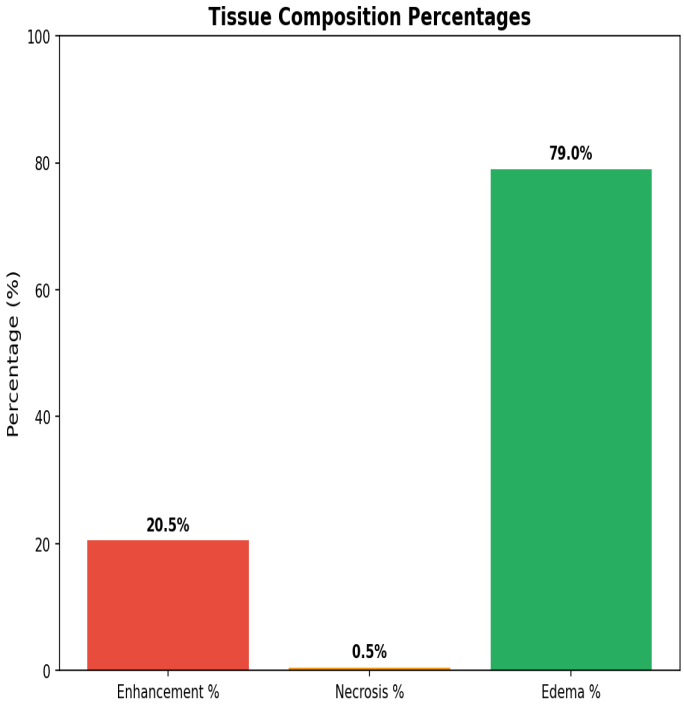
3D Volume Analysis

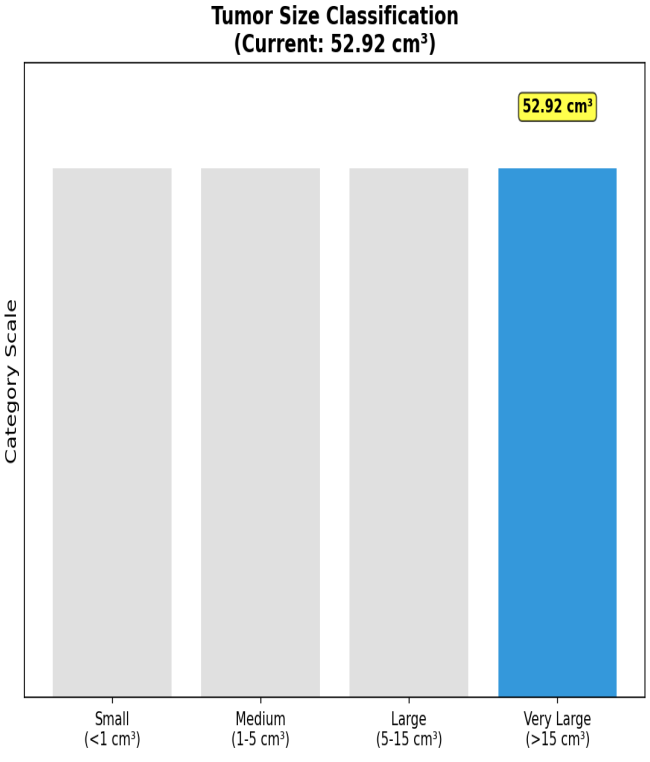

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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