BRAIN TUMOR ANALYSIS REPORT

AI-Powered Segmentation and Clinical Assessment

Patient Information

Field	Value
Report Date	2025-09-17T20:23:14.049844
Case ID	case_0ec043ff-16de-481b-aac3-f5cd08fa507f

AI-GENERATED CLINICAL REPORT

EXECUTIVE SUMMARY

This case demonstrates a large right-sided central brain tumor with moderate enhancement, minimal necrosis, and significant peritumoral edema. The tumor exhibits typical features of a high-grade glioma with a heterogeneous composition and strong contrast enhancement. The presence of edema and moderate enhancement supports the need for urgent multidisciplinary evaluation and potential biopsy or surgical resection.

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 raises concern for potential involvement of critical motor and sensory pathways, necessitating careful planning for any neurosurgical intervention or radiation therapy 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 consistent with active tumor proliferation and blood-brain barrier disruption, suggesting a high-grade glioma or anaplastic lesion. The relatively low necrotic component supports a more aggressive but not fully degenerated tumor.

TISSUE COMPOSITION ANALYSIS

| Tissue Component | Present/Absent | Clinical Interpretation |

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| Enhancing Tissue | Present | Indicates viable tumor tissue with active angiogenesis and potential for aggressive behavior. |

| Necrotic Core | Present | Minimal necrosis (0.5%) suggests a well-vascularized tumor with limited areas of cell death. |

| Peritumoral Edema | Present | Extensive edema (79%) is a marker of significant tumor mass effect and likely increased intracranial pressure. |

CLINICAL ASSESSMENT

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

• Differential Diagnosis: Likely primary glioblastoma multiforme (GBM) or anaplastic astrocytoma, given the large volume, moderate enhancement, and minimal necrosis. Metastatic disease or other high-grade gliomas should also be considered.

• Prognosis Indicators: The presence of significant edema and moderate enhancement may indicate a more aggressive tumor biology, though the minimal necrosis is somewhat reassuring. Surgical resection and adjuvant therapy are likely indicated.

RECOMMENDATIONS

1. Immediate Actions: Urgent neurological evaluation and consideration of neurosurgical consultation for biopsy or resection.

2. Additional Imaging: Consider perfusion MRI and spectroscopy to further characterize tumor metabolism and vascularity.

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

4. Follow-up Protocol: Serial MRI every 3–6 months post-treatment to assess response and detect recurrence.

5. Treatment Considerations: Likely indication for maximal safe resection followed by concurrent chemoradiotherapy with temozolomide, based on imaging findings and tumor grade.

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 tumor margins and inability to definitively distinguish tumor subtypes without histopathological confirmation.

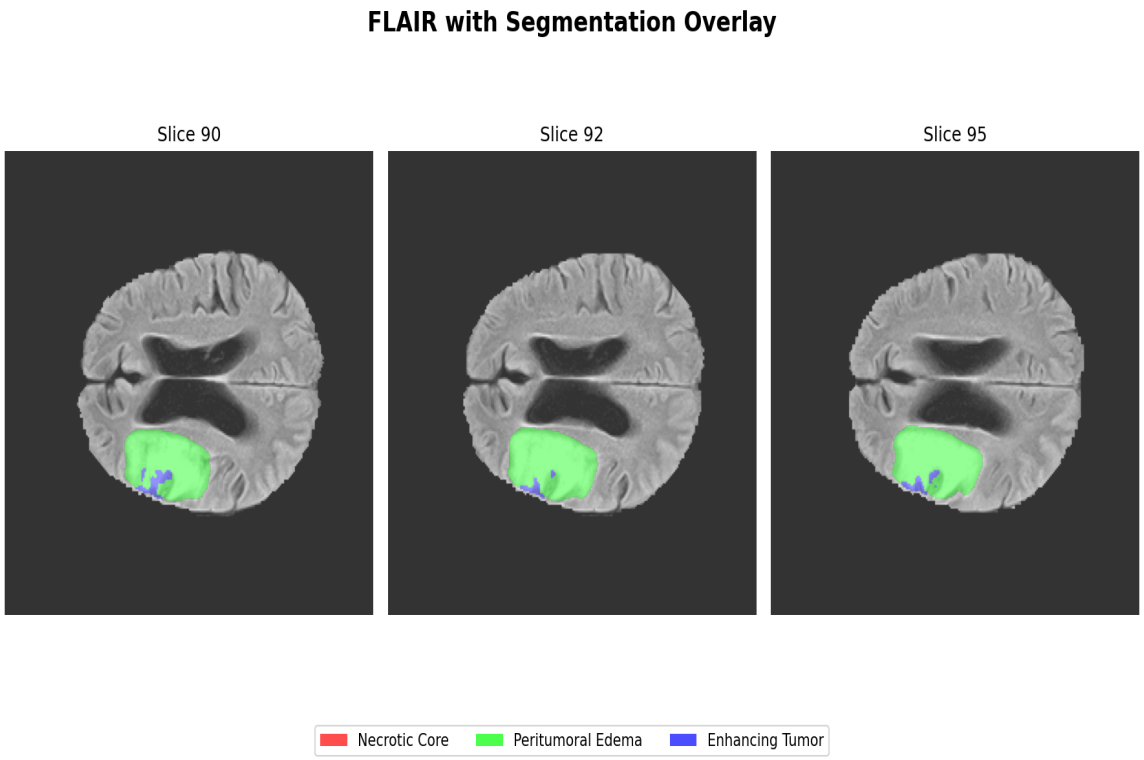
Report Generated: September 17, 2025 at 08:22 PM

System: AI-Assisted Brain Tumor Analysis Platform

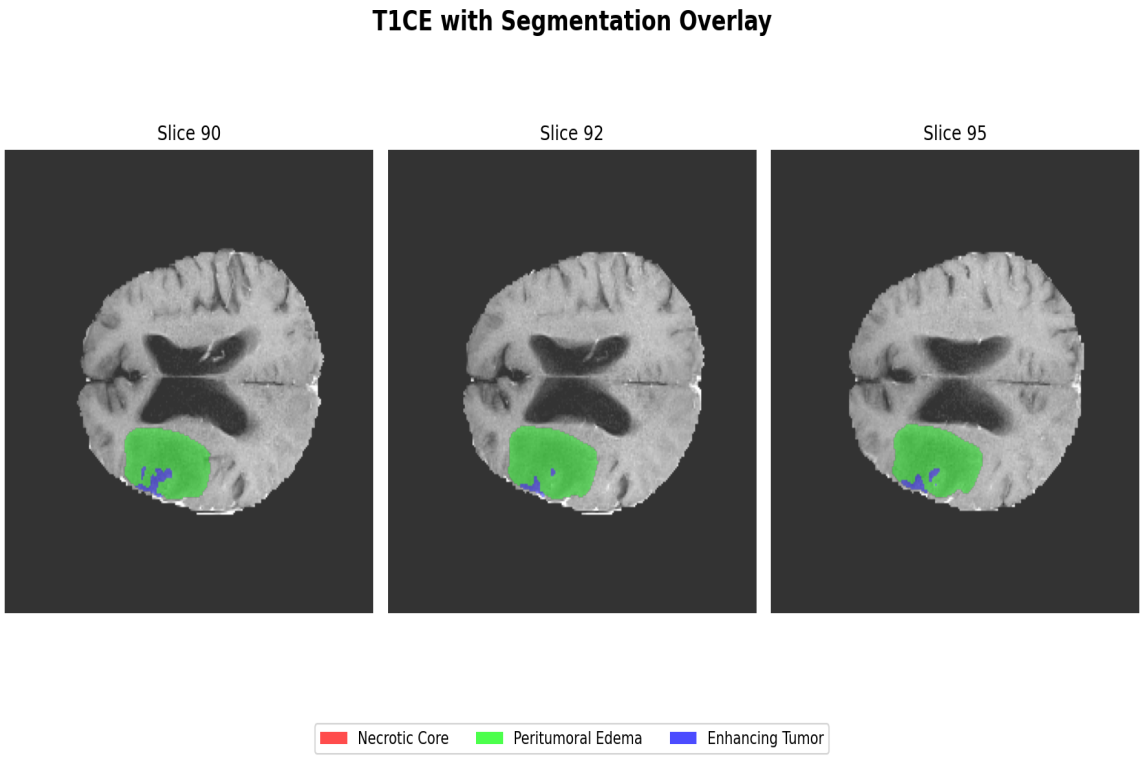
Case ID: case_0ec043ff-16de-481b-aac3-f5cd08fa507f

SEGMENTATION VISUALIZATIONS

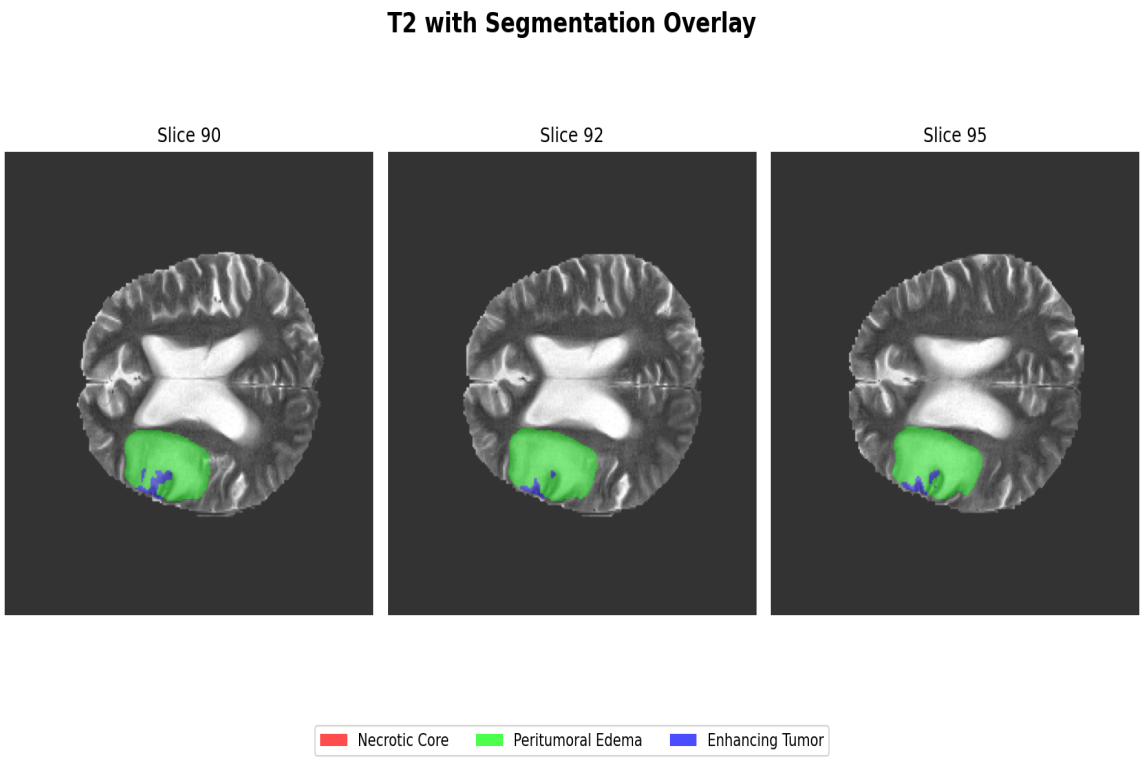
FLAIR Segmentation Overlay



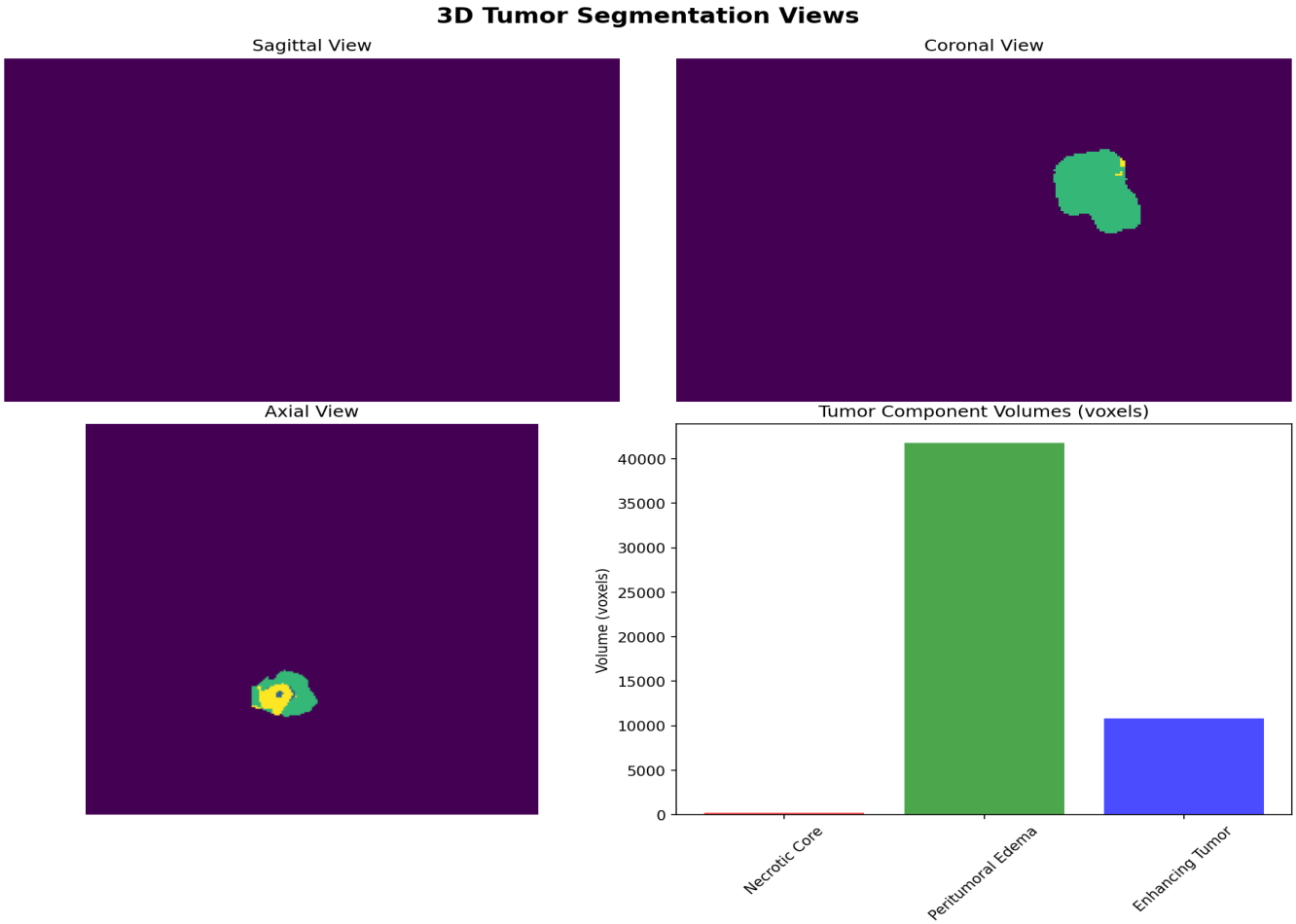
T1CE Segmentation Overlay



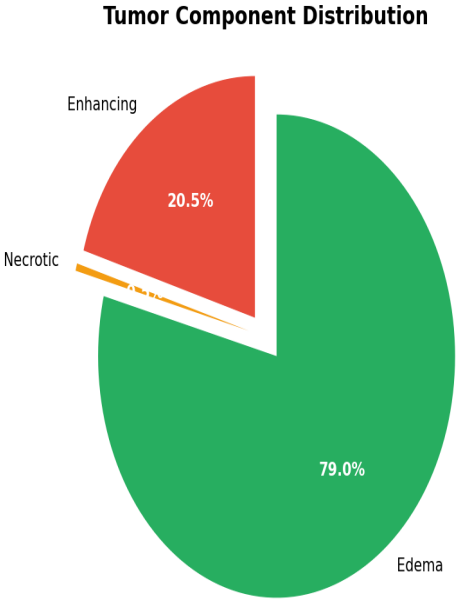
T2 Segmentation Overlay

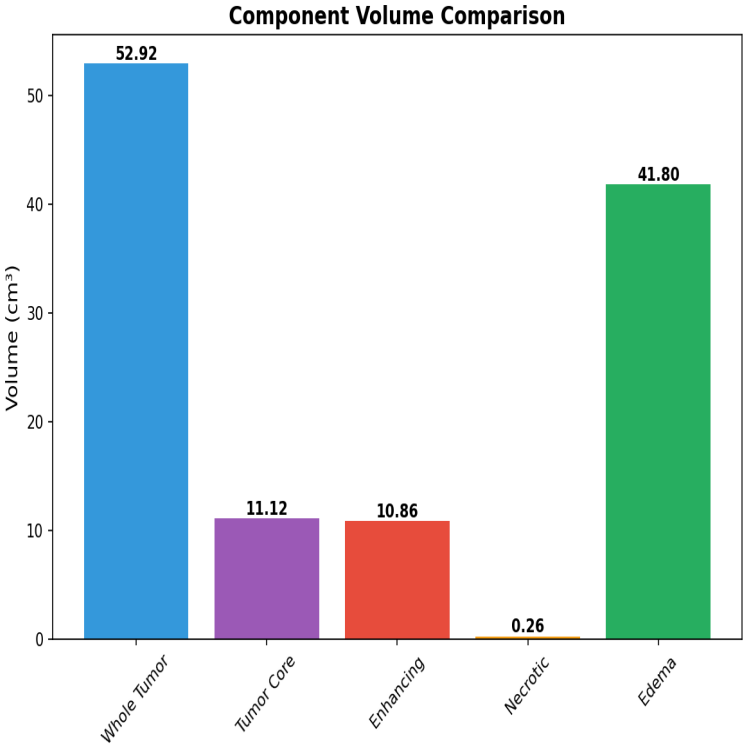


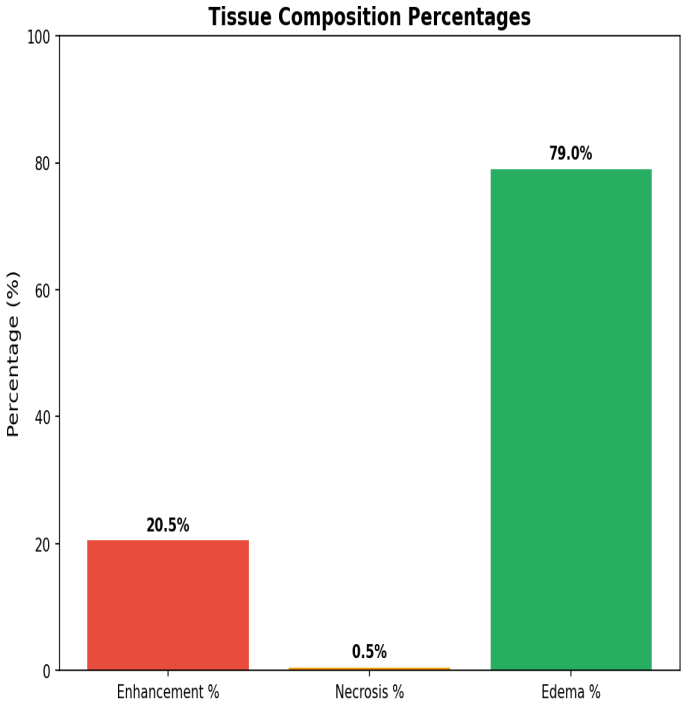
3D Volume Analysis

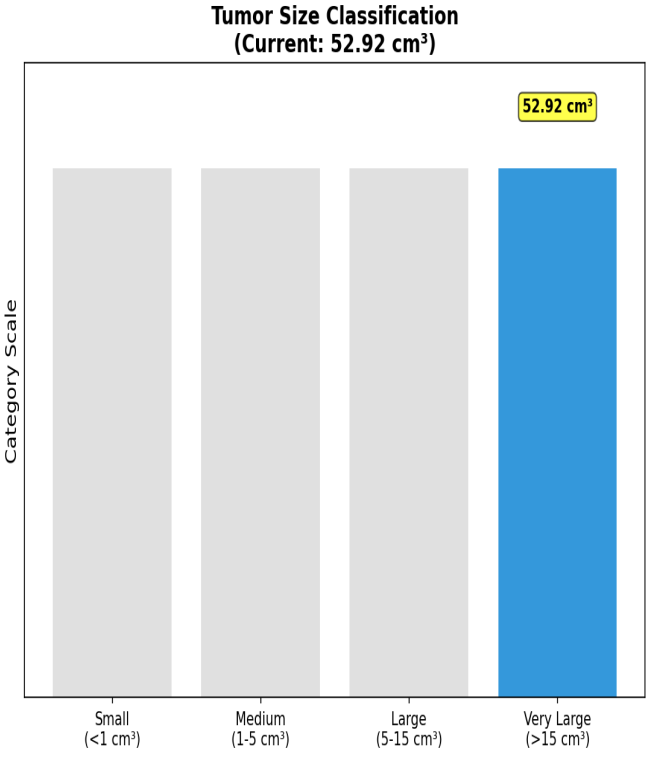

3D Tumor Segmentation Views
Sagittal View
Coronal View
Axial View
Tumor Component Volumes (voxels)
Volume (voxels)
0
5000
10000
15000
20000
25000
30000
35000
40000
Necrotic Core
Peritumoral Edema
Enhancing Tumor

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 08:23 PM using microsoft/DialoGPT-medium.