

# BRAIN TUMOR ANALYSIS REPORT

## AI-Powered Segmentation and Clinical Assessment

### Patient Information

Field	Value
Report Date	2025-09-19T07:55:47.689056
Case ID	case_5a9ceaec-d438-4dc2-b4c1-1c2b91d17b8d

# AI-GENERATED CLINICAL REPORT

## EXECUTIVE SUMMARY

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A large right-sided central brain tumor with moderate enhancement and minimal necrosis is identified. The lesion demonstrates significant peritumoral edema and a heterogeneous tissue composition, consistent with a high-grade glioma. Imaging findings support the need for urgent multidisciplinary evaluation and histopathological confirmation for appropriate management planning.

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## TUMOR MORPHOLOGY AND LOCATION

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- **Location:** Right hemisphere, central region
- **Size Classification:** Very large ( $>15\text{ cm}^3$ )
- **Maximum Diameter:** 62.0 mm
- **Anatomical Considerations:** The central location in the right hemisphere may impact motor and sensory functions, particularly given proximity to critical white matter tracts and the motor cortex. The presence of significant edema increases the risk of mass effect and potential neurological deficits.

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## QUANTITATIVE ANALYSIS

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- **Total Tumor Volume:**  $52.92\text{ cm}^3$
- **Tumor Core Volume:**  $11.12\text{ cm}^3$
- **Enhancing Component:**  $10.86\text{ cm}^3$  (20.5%)
- **Necrotic Component:**  $0.26\text{ cm}^3$  (0.5%)
- **Edematous Component:**  $41.80\text{ cm}^3$  (79.0%)

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## ENHANCEMENT CHARACTERISTICS

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- **Enhancement Pattern:** Moderate (10–30%)
- **Enhancement Intensity:** Mean 520.73, Maximum 1146.00
- **Clinical Significance:** Moderate enhancement is suggestive of active tumor proliferation and blood-brain barrier disruption. The absence of extensive rim enhancement raises considerations for low-grade glioma or certain high-grade gliomas with heterogeneous perfusion characteristics.

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TISSUE COMPOSITION ANALYSIS

Tissue Component	Status	Clinical Interpretation
Enhancing Tissue	Present	Indicates viable tumor tissue with active proliferation and/or vascular p
Necrotic Core	Present	Minimal necrosis (0.5%) supports a relatively well-vascularized tumor v
Peritumoral Edema	Present	Extensive edema (79%) is consistent with high-grade glioma and sugg

CLINICAL ASSESSMENT

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- **Tumor Grade Indicators:** Moderate enhancement, presence of necrosis, and significant edema are consistent with a high-grade glioma (e.g., glioblastoma or anaplastic astrocytoma).
- **Differential Diagnosis:** Likely primary glioblastoma, anaplastic astrocytoma, or oligodendroglioma with areas of degeneration. Further histopathological analysis is required for definitive diagnosis.
- **Prognosis Indicators:** The presence of significant edema, moderate enhancement, and minimal necrosis suggests a potentially aggressive tumor with a poor prognosis if not treated promptly.

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RECOMMENDATIONS

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1. **Immediate Actions:** Urgent neurosurgical evaluation for possible biopsy or resection. Clinical neurological assessment to evaluate for mass effect or focal deficits.
2. **Additional Imaging:** Consider perfusion MRI and spectroscopy to further characterize tumor biology. Functional MRI (fMRI) may be indicated to assess functional brain mapping pre-surgery.

3. **Multidisciplinary Review:** Initiate discussion with neuro-oncology, neurosurgery, and radiation oncology teams for treatment planning.
4. **Follow-up Protocol:** Schedule MRI within 1–2 weeks post-intervention for response assessment. Routine surveillance imaging every 3–6 months post-treatment.
5. **Treatment Considerations:** Based on imaging features, multimodal treatment including surgery, radiation therapy, and chemotherapy (e.g., temozolomide) should be considered. Biopsy should be prioritized to confirm histology.

## 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 tumor extent due to partial volume effects and the inability to differentiate between tumor recurrence and treatment-related changes without additional functional imaging.

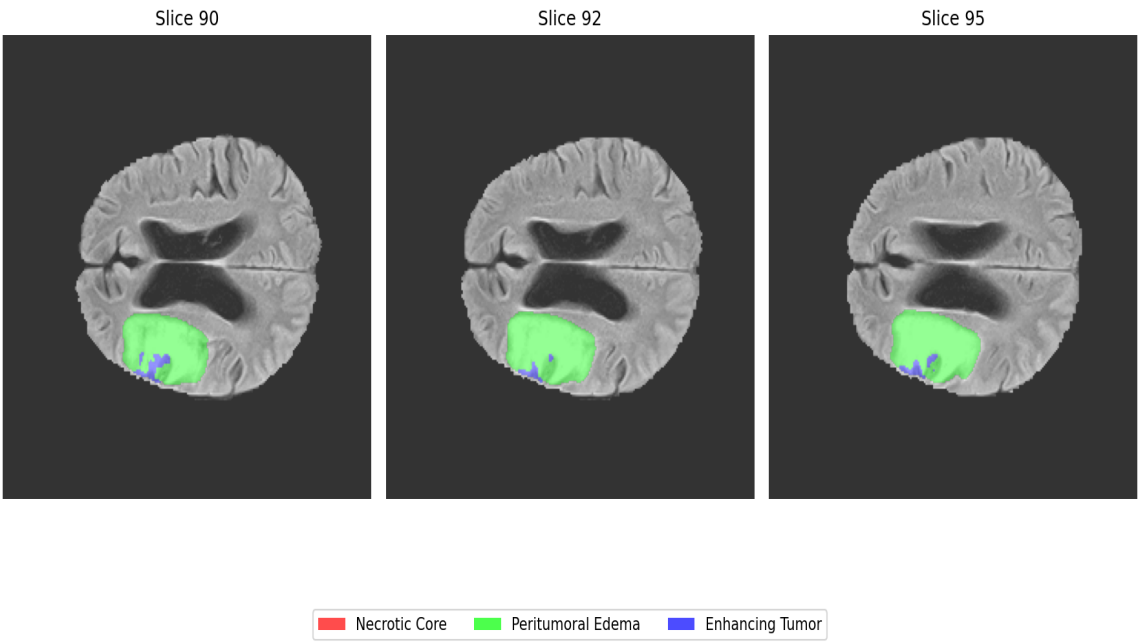
Report Generated: September 19, 2025 at 07:55 AM

System: AI-Assisted Brain Tumor Analysis Platform

# SEGMENTATION VISUALIZATIONS

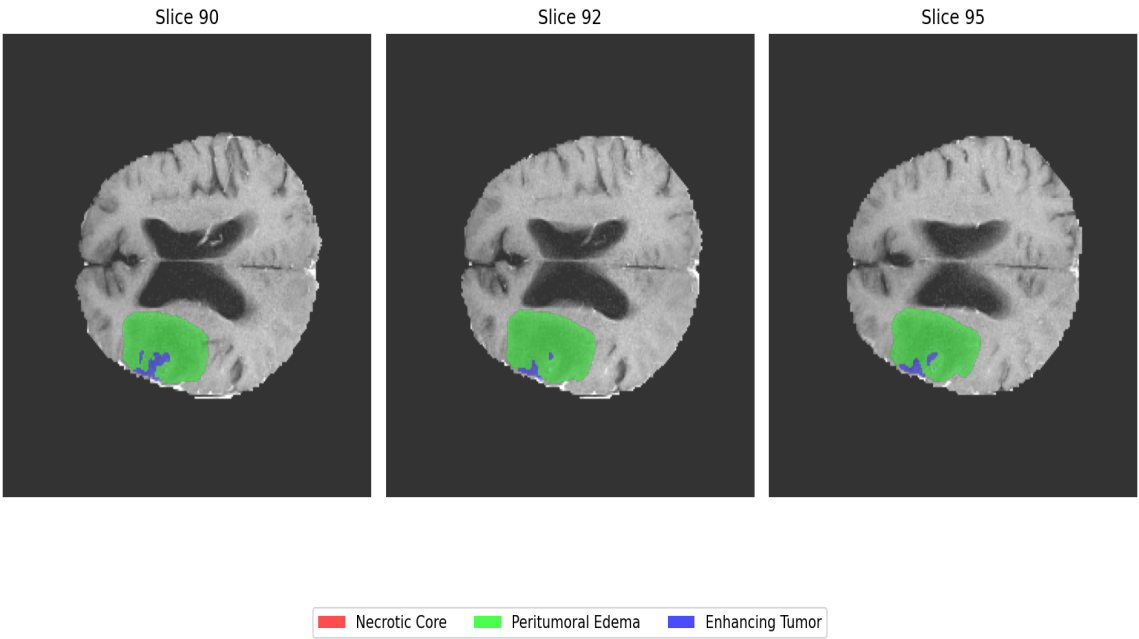
## FLAIR Segmentation Overlay

FLAIR with Segmentation Overlay



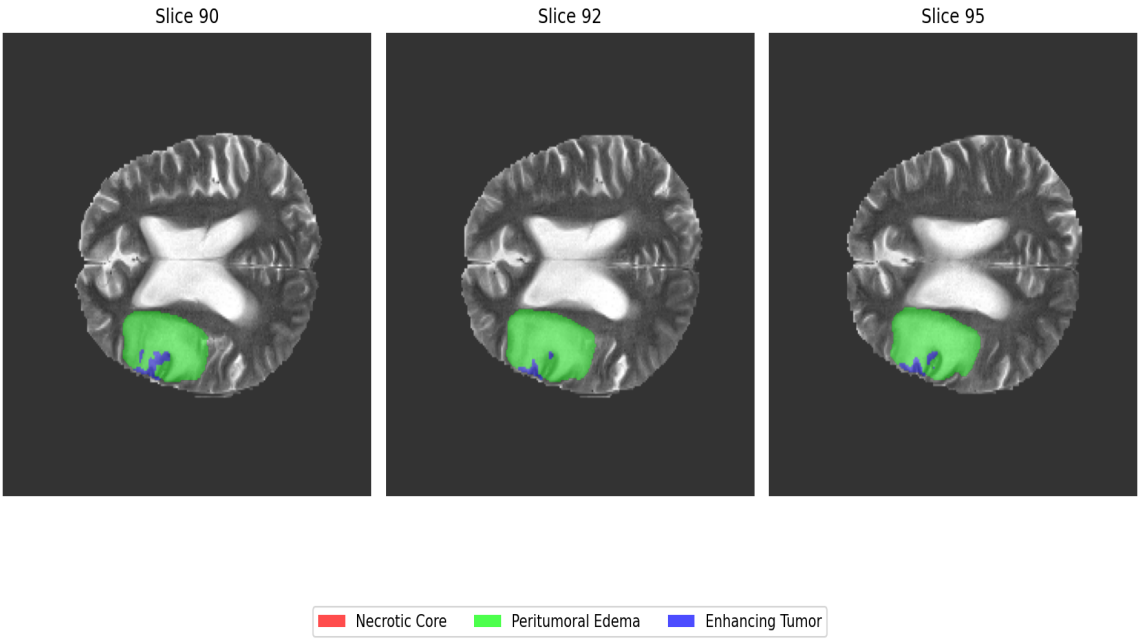
## T1CE Segmentation Overlay

### T1CE with Segmentation Overlay



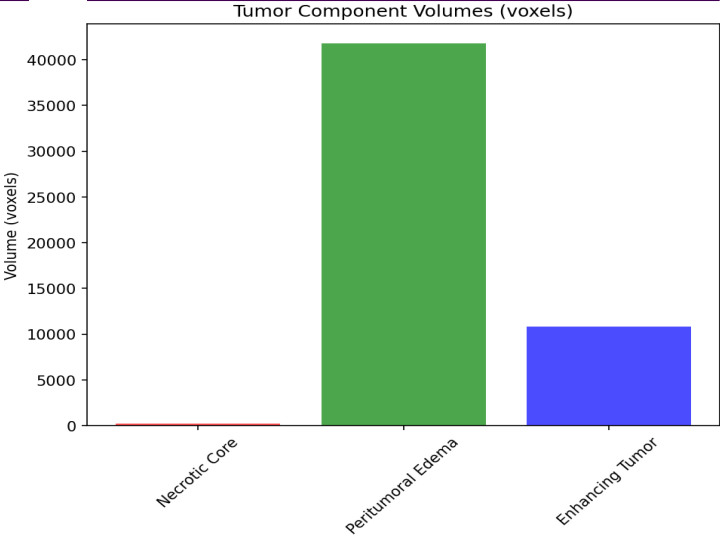
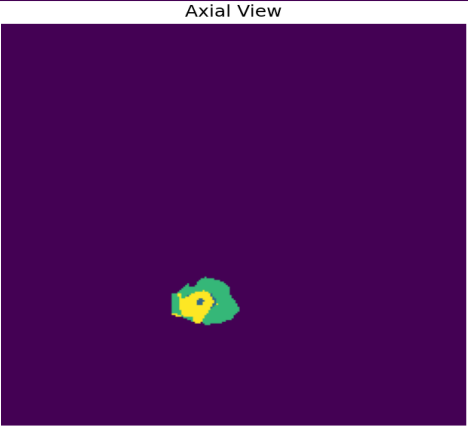
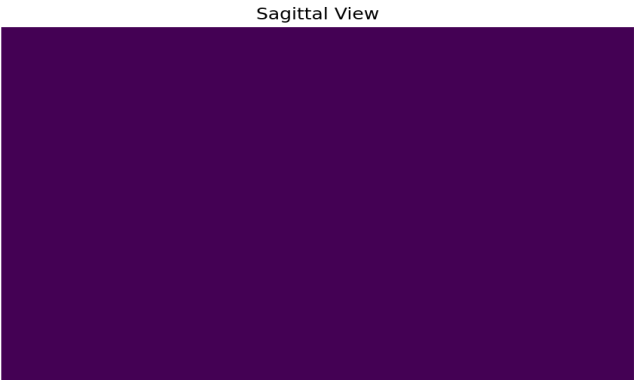
### T2 Segmentation Overlay

#### T2 with Segmentation Overlay



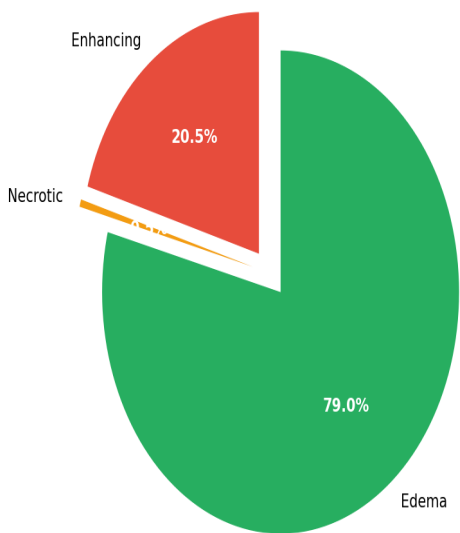
### 3D Volume Analysis

3D Tumor Segmentation Views

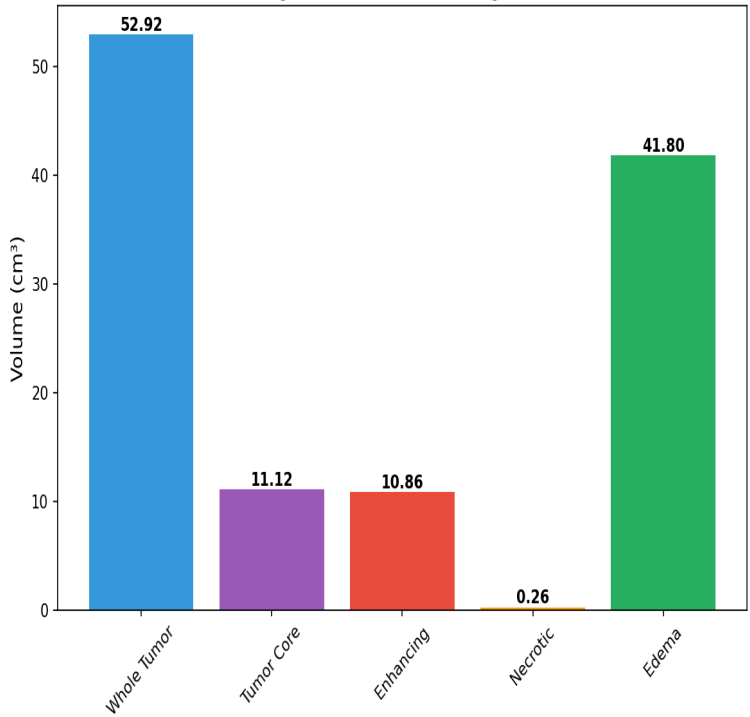


# QUANTITATIVE ANALYSIS

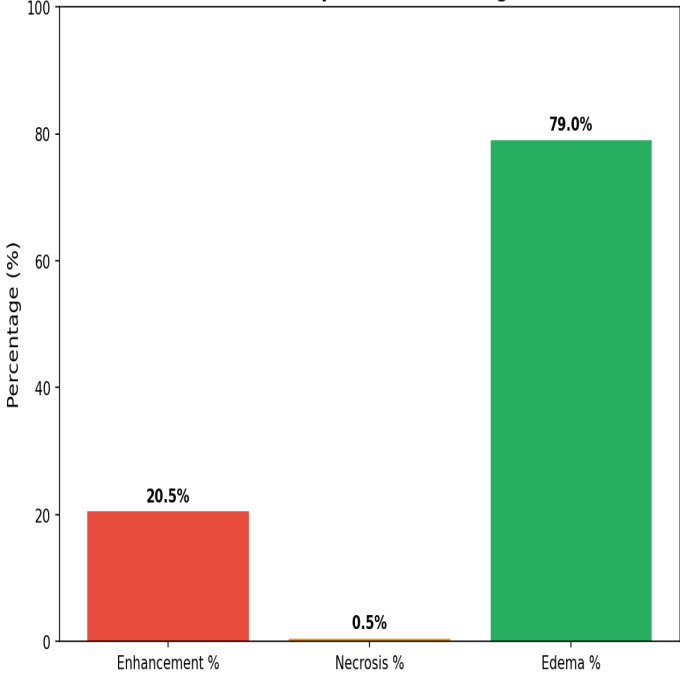
Tumor Component Distribution



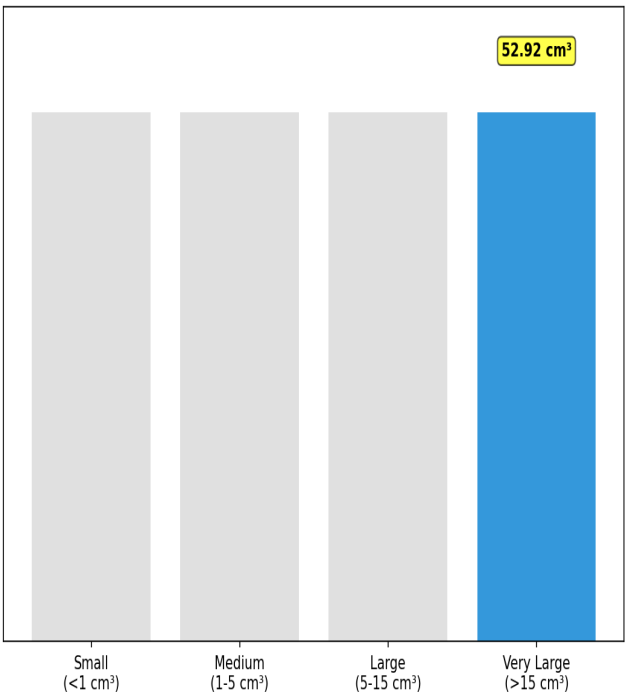
Component Volume Comparison



Tissue Composition Percentages



Tumor Size Classification  
(Current: 52.92 cm³)





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 07:55 AM using Qwen/Qwen3-Coder-30B-A3B-Instruct.