

Surgery: Role and Options



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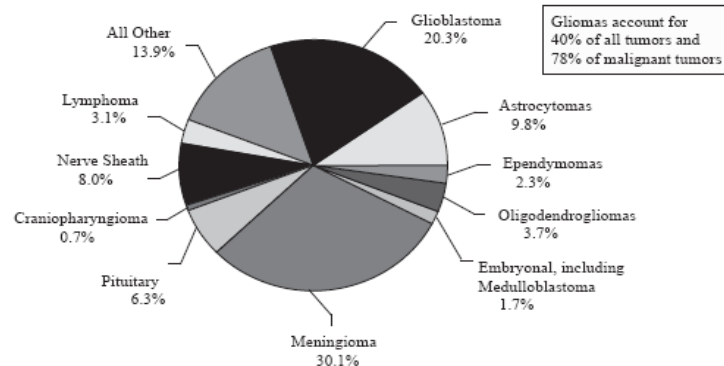
Tumor Grading

- **Low Grade**
- Few dividing cells (mitoses)
- May have bizarre nuclei
- No vascular proliferation
- No necrosis
- **High Grade**
- Many dividing cells (mitoses)
- Bizarre nuclei
- Vascular proliferation
- Necrosis

Grading Scheme

- Grade I
 - Well-circumscribed
- Grade II
 - Infiltrating, bizarre nuclei
- Grade III (anaplastic astrocytoma, AA)
 - Mitoses, bizarre nuclei, vascular proliferation
- Grade IV (glioblastoma, GBM)
 - Mitoses, bizarre nuclei, vascular proliferation, necrosis

Figure 6. Distribution of All Primary Brain and CNS Tumors by Histology
CBTRUS 1998-2002 (n=63,698)



Glioblastoma (GBM)

- Mean survival 12-14 months
 - With radiation therapy, chemotherapy
- Mean survival without treatment is 1-2 months
- Long-term survivors- 5-6 % at 2 years to 40%
- Potential benefits from: age <50, neurologic status, whether the tumor can be removed
- Largest part is response to therapy

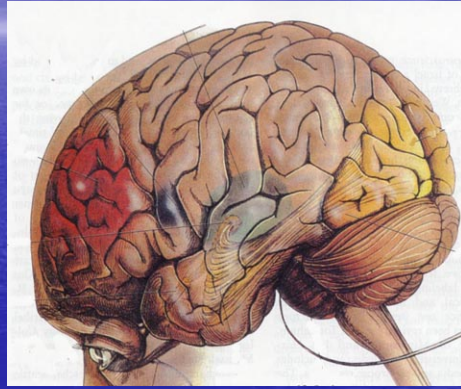
Symptoms

- **Location in the brain**
- Frontal: weakness, trouble speaking, personality changes
- Temporal: speech trouble, vision trouble, seizures



Symptoms

- Parietal lobe: trouble with sensation, calculations, dressing, vision trouble
- Occipital lobe: vision trouble
- Cerebellum: double vision, hydrocephalus

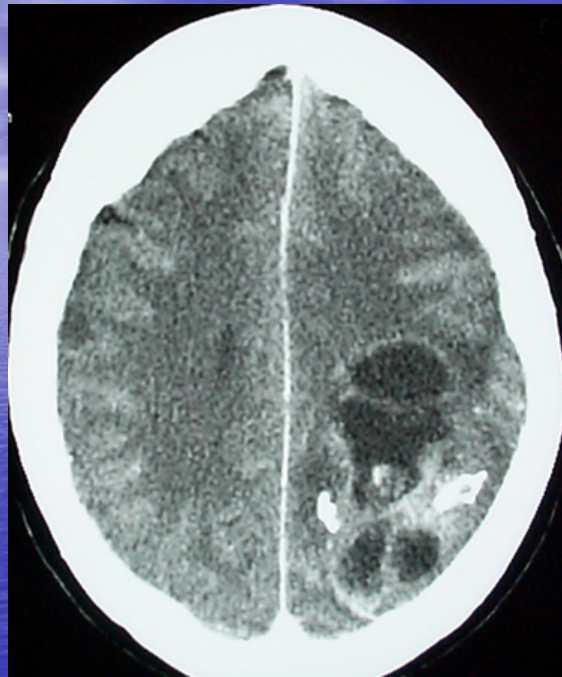


Diagnosis

- Computerized tomography (CT or CAT) scan
 - Low density or same density as brain
 - Little enhancement
 - Swollen gyrus
 - Calcifications
 - May be cystic

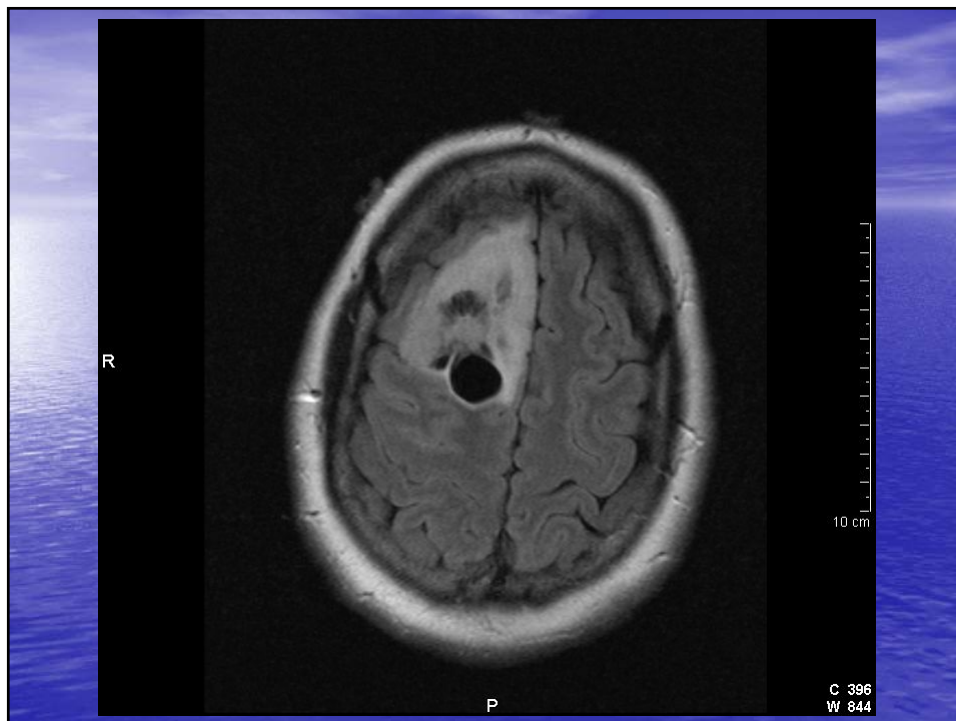
Diagnosis

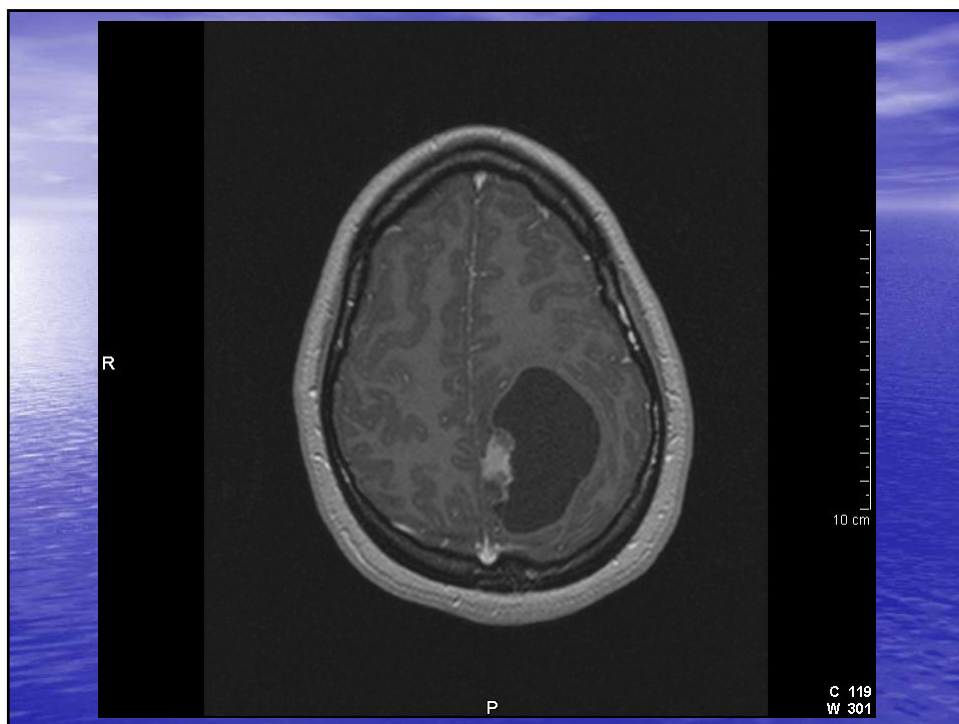
- Computerized tomography (CT or CAT) scan
 - Low density or same density as brain
 - May have enhancement
 - Swollen gyrus
 - Calcifications if low grade
 - May be cystic



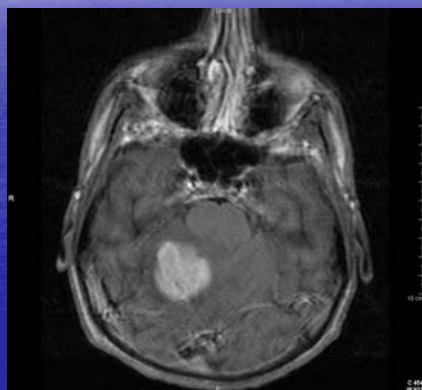
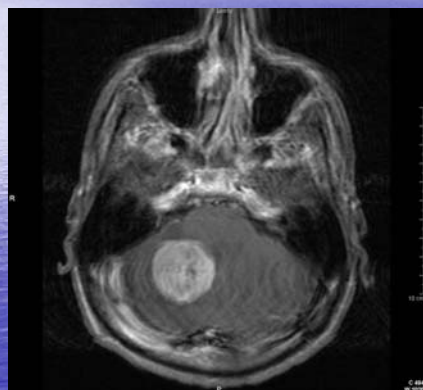
Diagnosis

- Magnetic resonance imaging (MRI)
 - Decreased signal attenuation on T1
 - Increased on T2
 - Little or patchy enhancement to significant enhancement
 - Enhancement can be a sign of a low grade tumor but is more often consistent with malignancy
 - May be cystic or necrotic





Surgical treatments



Surgery



Surgery

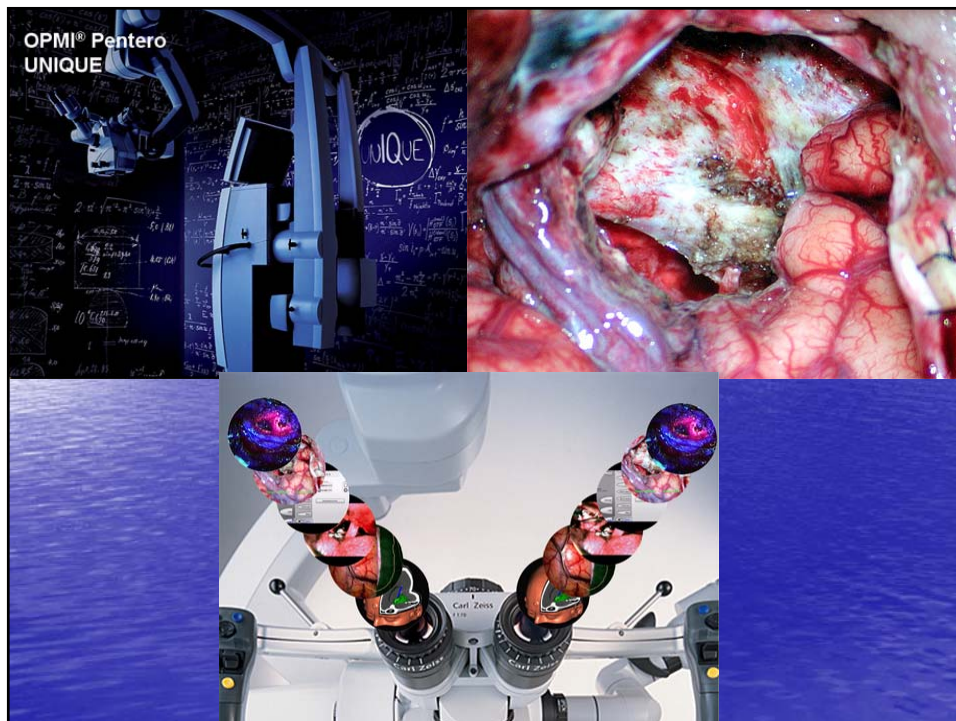
- Biopsy- small opening
- Craniotomy- larger opening in the skull
- Stereotactically with a head frame
- Frameless stereotaxy
- Intraoperative MRI

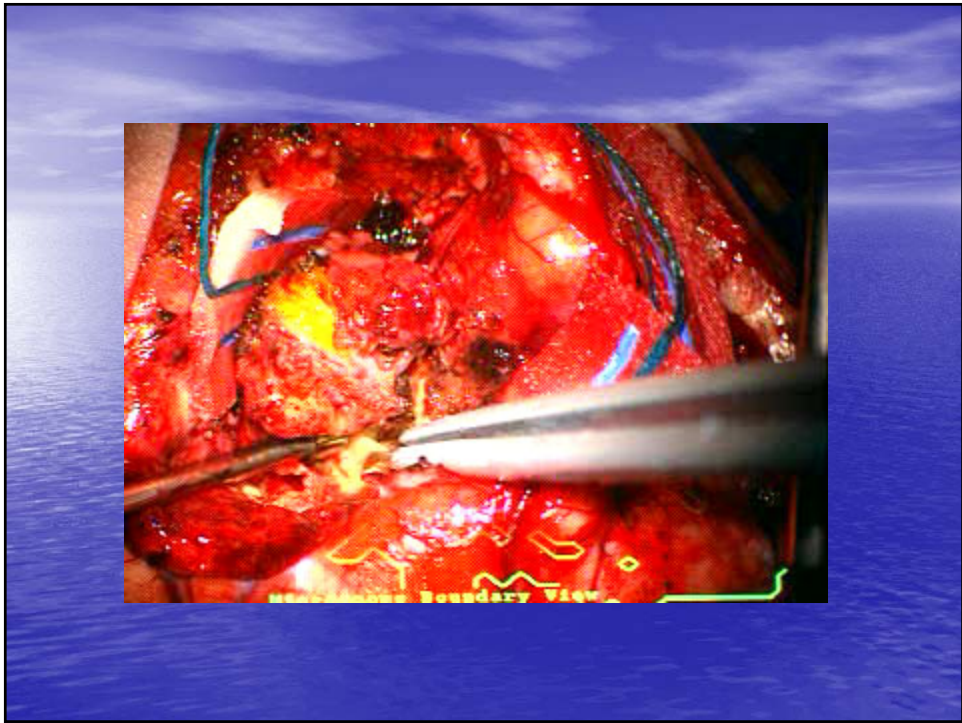


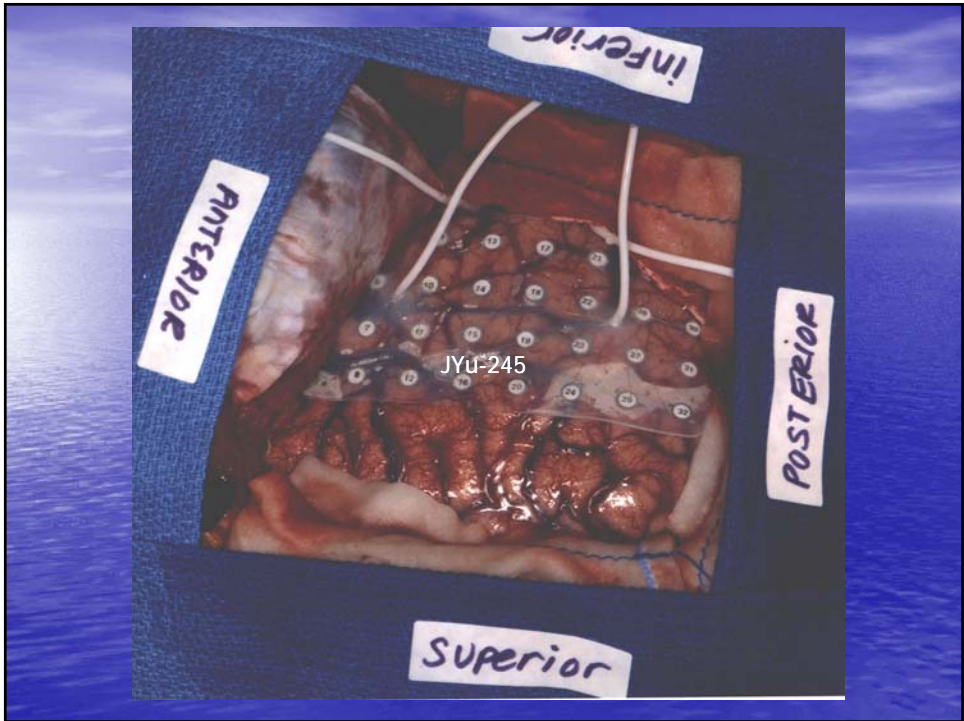
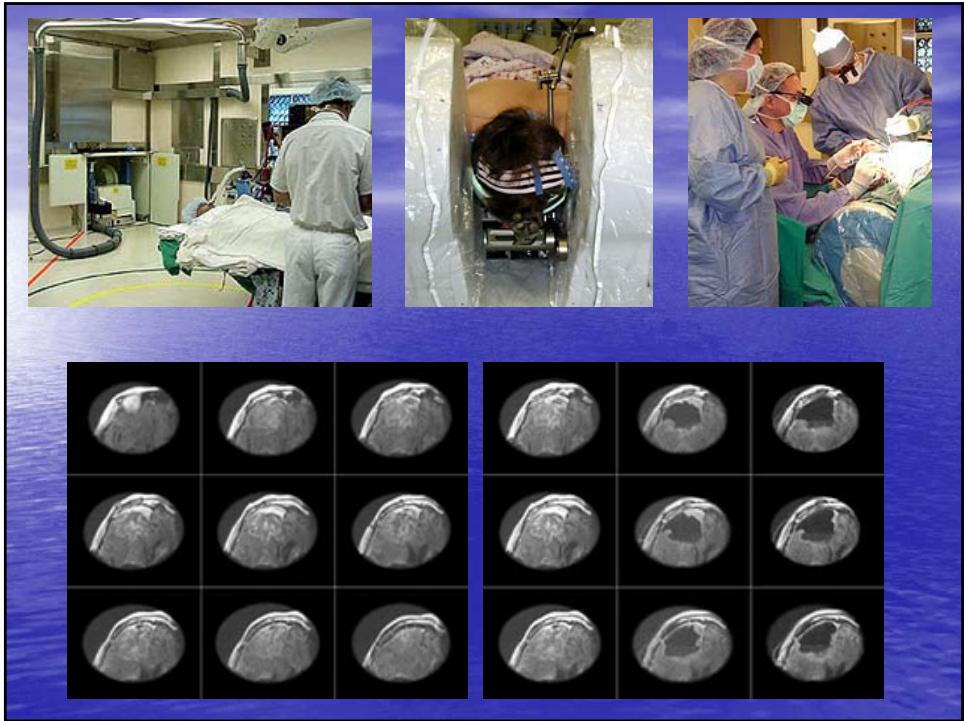


Surgical Advancements

- Operating microscope
- Ultrasonic aspirator
- Intraoperative ultrasound
- Laser (YAG, CO2)
- Frameless stereotactic navigation
- Intraoperative MRI
- Brain mapping (electrocorticography)



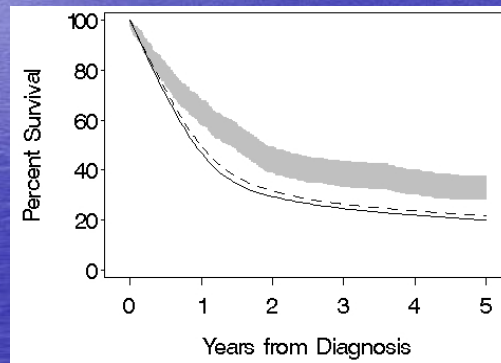




Quality and Outcomes

LEGEND: CSMC Average Range — National Average - - - - California Average

• Brain Cancer Survival Rates:



Source: National Cancer Database; Cedars-Sinai Cancer Registry. Most recent 5 year NCDB Brain Cancer survival rates for Cedars-Sinai, California, and National averages (for patients diagnosed 1998- 2001)

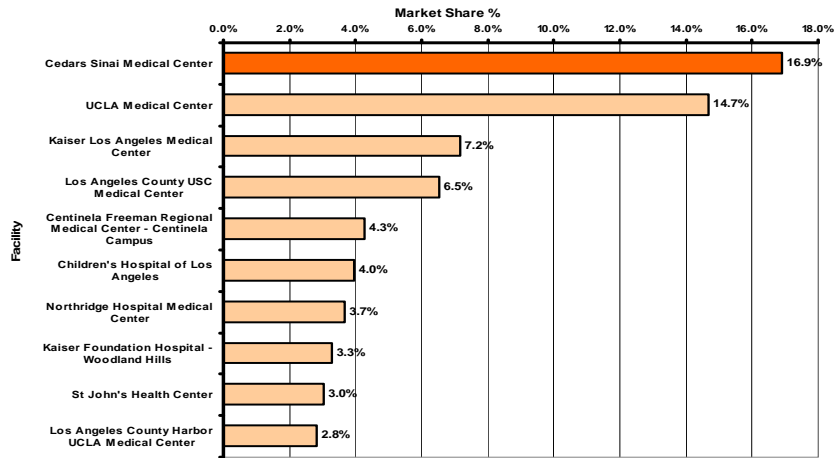
Quality and Outcomes

• Survival after Craniotomy for Malignant Brain Tumor Cases Diagnosed in 1998-2001

Survival Statistics for patients with Brain Tumors	CSMC Brain Tumor COE	CSMC	California	National
Total Patients:	72	388	3,493	36,351
One Year Survival:	75.9%	63.3%	49.8%	46.8%
Two Year Survival:	61.1%	44.6%	31.8%	29.5%
Three Year Survival:	55.9%	38.4%	26.4%	24.6%
Four Year Survival:	51.4%	35.4%	23.7%	22%
Five Year Survival:	50.1%	33%	21.8%	20%

Statistics from CA include 100 facilities (National Cancer Registry)
 Statistics from the US include 1280 facilities (National Cancer Registry)

Primary Service Area – 2007 Inpatient Brain Tumor Market Share



Source: Polaris, 2007 state data only, based on ICD-9 px codes for Brain Tumor.
The PSA represents the zip codes where the top 75% of Cedars-Sinai's inpatient discharges originate from.

- **Cedars-Sinai ranks first for inpatient brain tumor discharges in our Primary Service Area.**