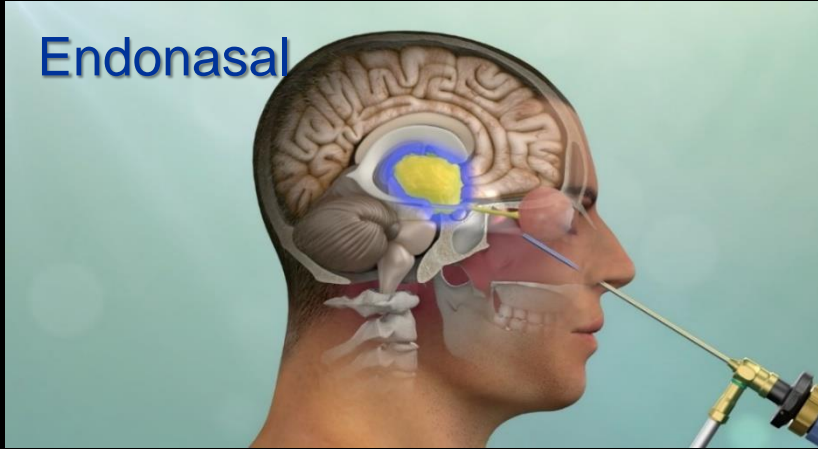


The Optimal Approach for Your Brain Tumor?

Endonasal



Supraorbital



Gravity-assisted



Mini-pterional



Retromastoid

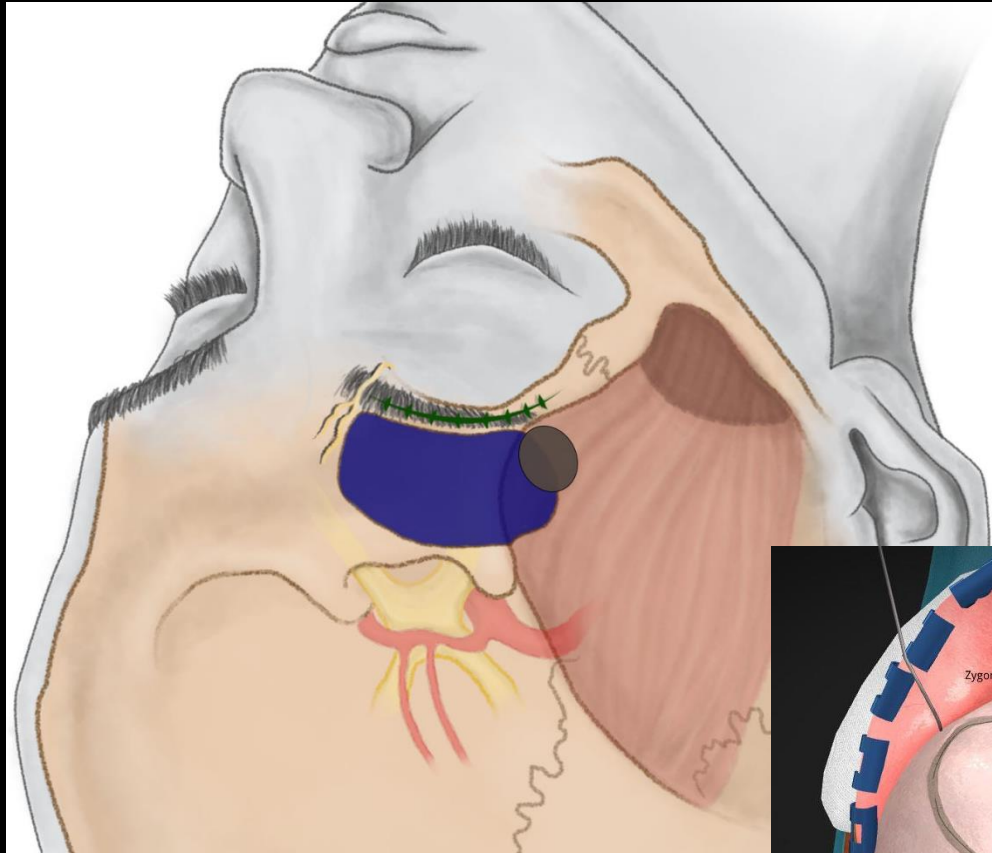


Brain Port

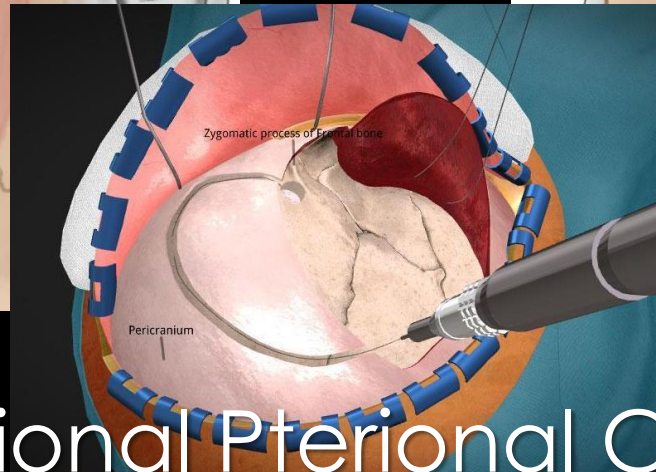
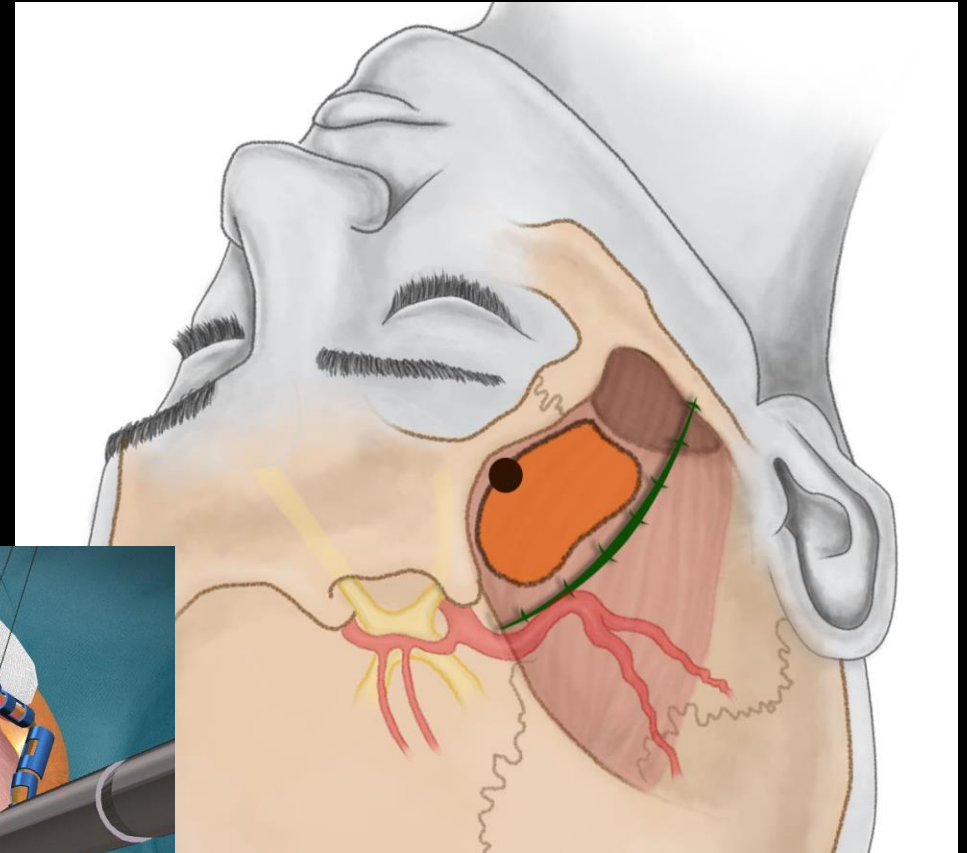


At PNI, for tumors of the frontal or middle fossa, we routinely use the *supraorbital* or *minipterional* approaches instead of traditional larger pterional (fronto-temporal) or bi-frontal craniotomies that involve larger scalp incisions and bony openings. Endoscopy and low-profile instruments allow excellent access to tumors through these smaller keyhole openings.

Supraorbital Craniotomy



Minipterional Craniotomy

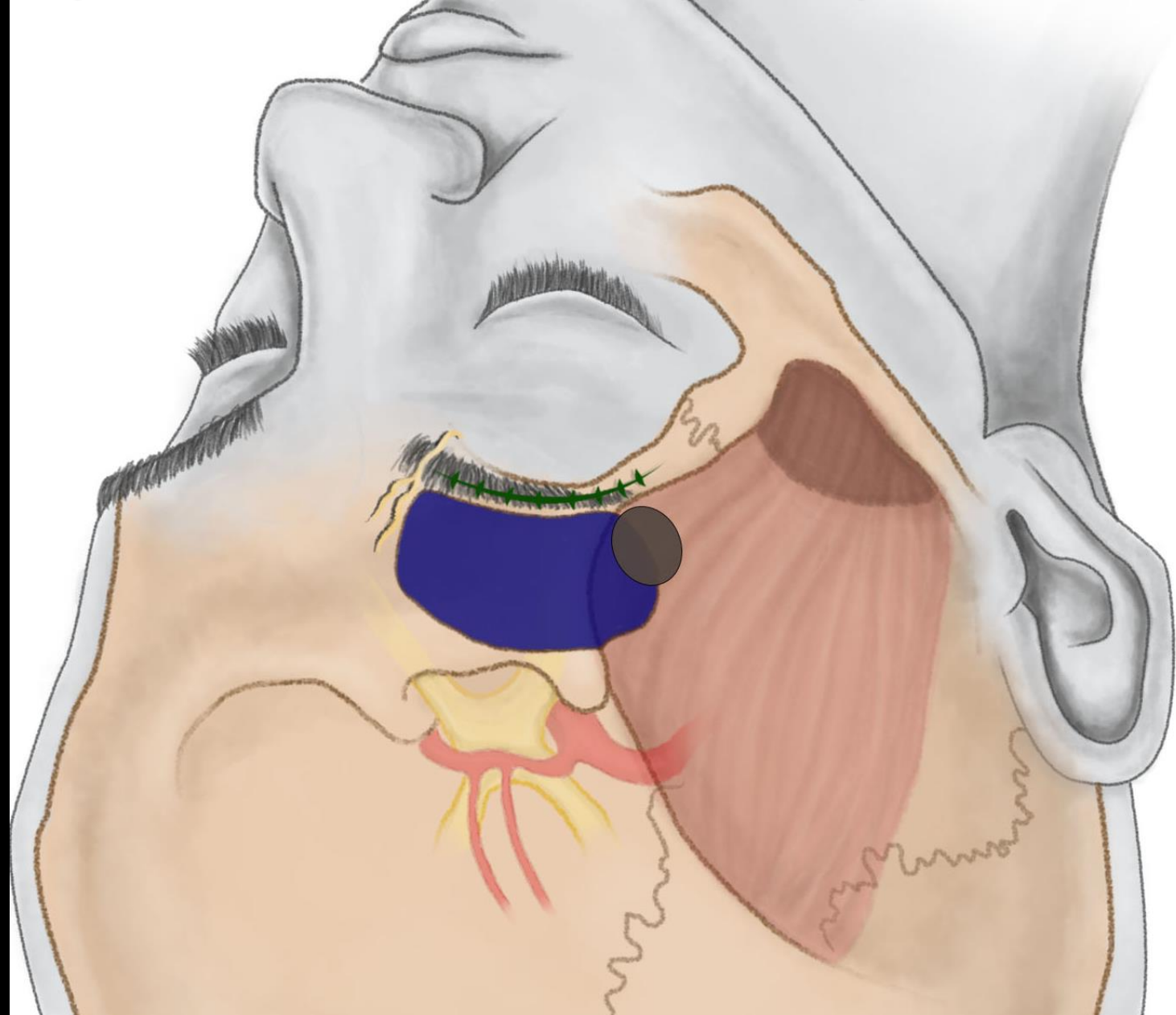
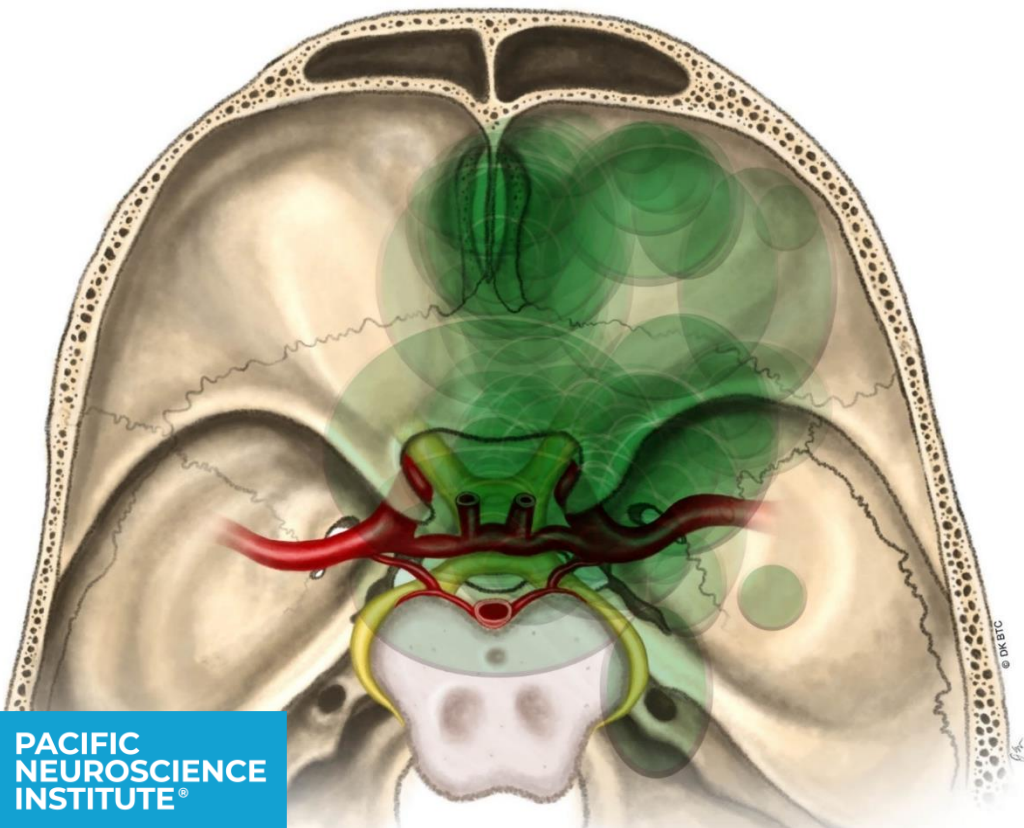


Traditional Pterional Craniotomy

Supraorbital Eyebrow Craniotomy

Most common brain tumors types:

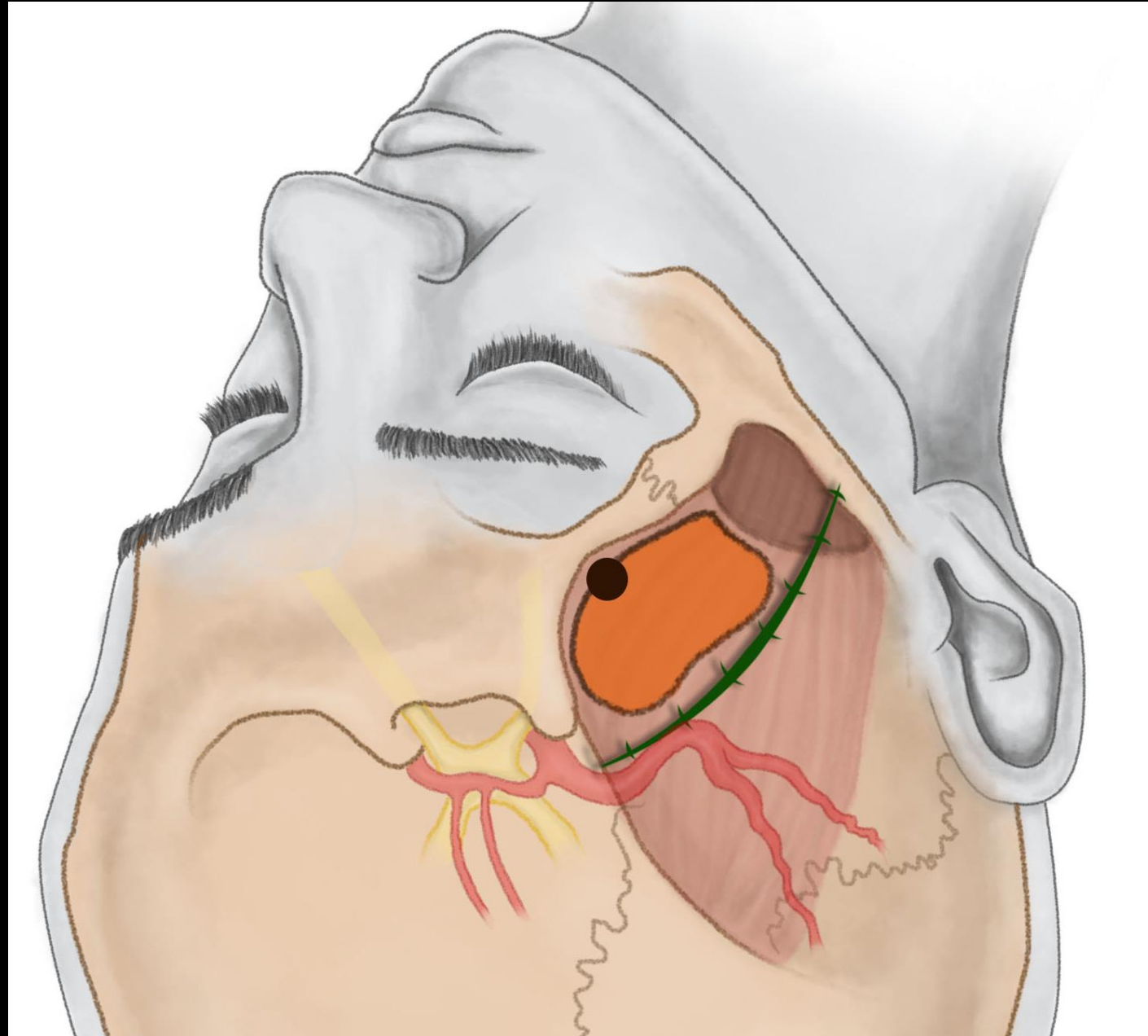
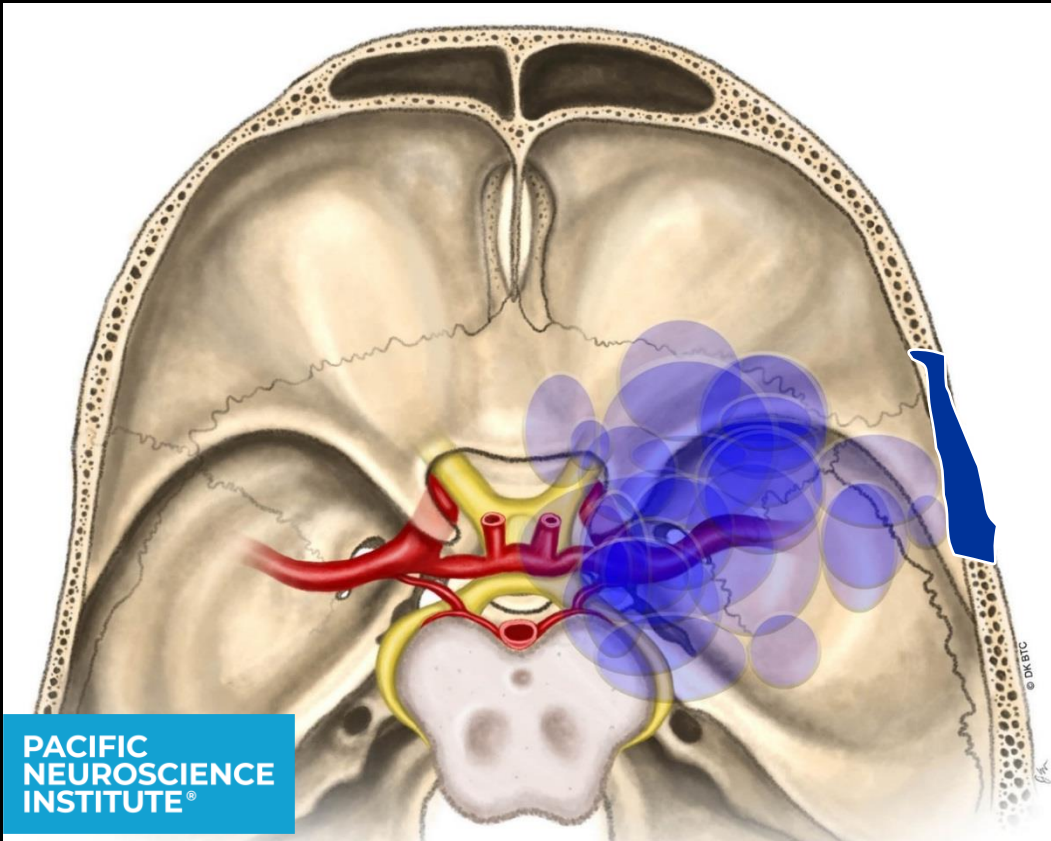
- Meningioma
- Glioma/GBM
- Metastatic brain tumor
- Craniopharyngioma



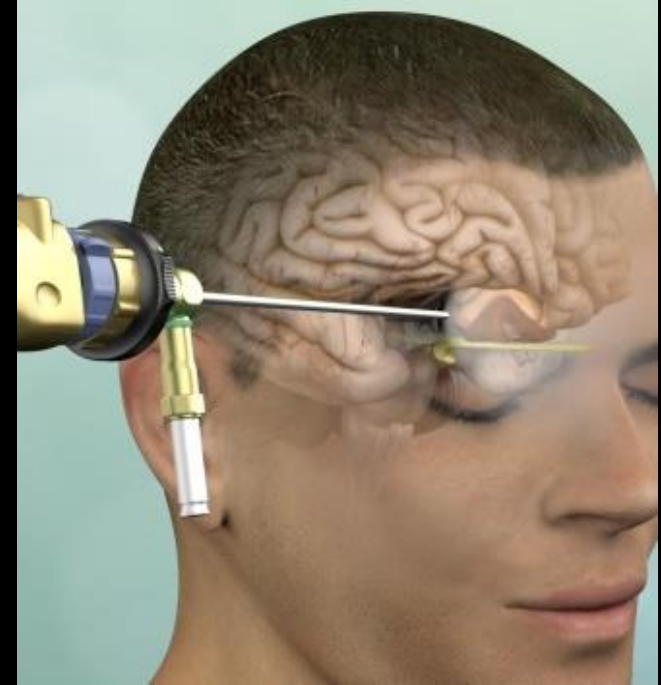
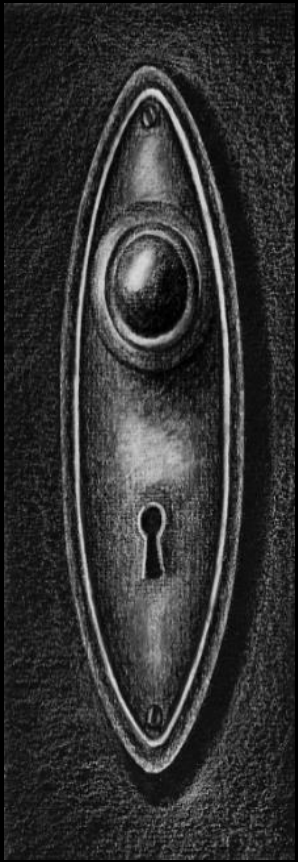
Mini-pterional Craniotomy

Most common brain tumors types:

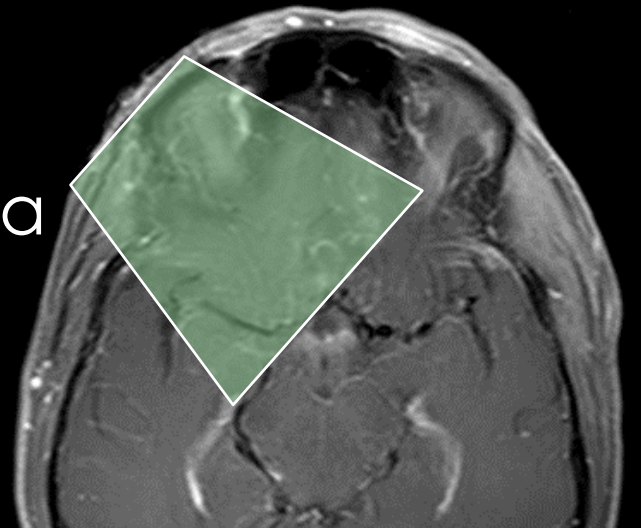
- Meningioma
- Glioma/GBM
- Metastatic brain tumor
- Orbital tumor



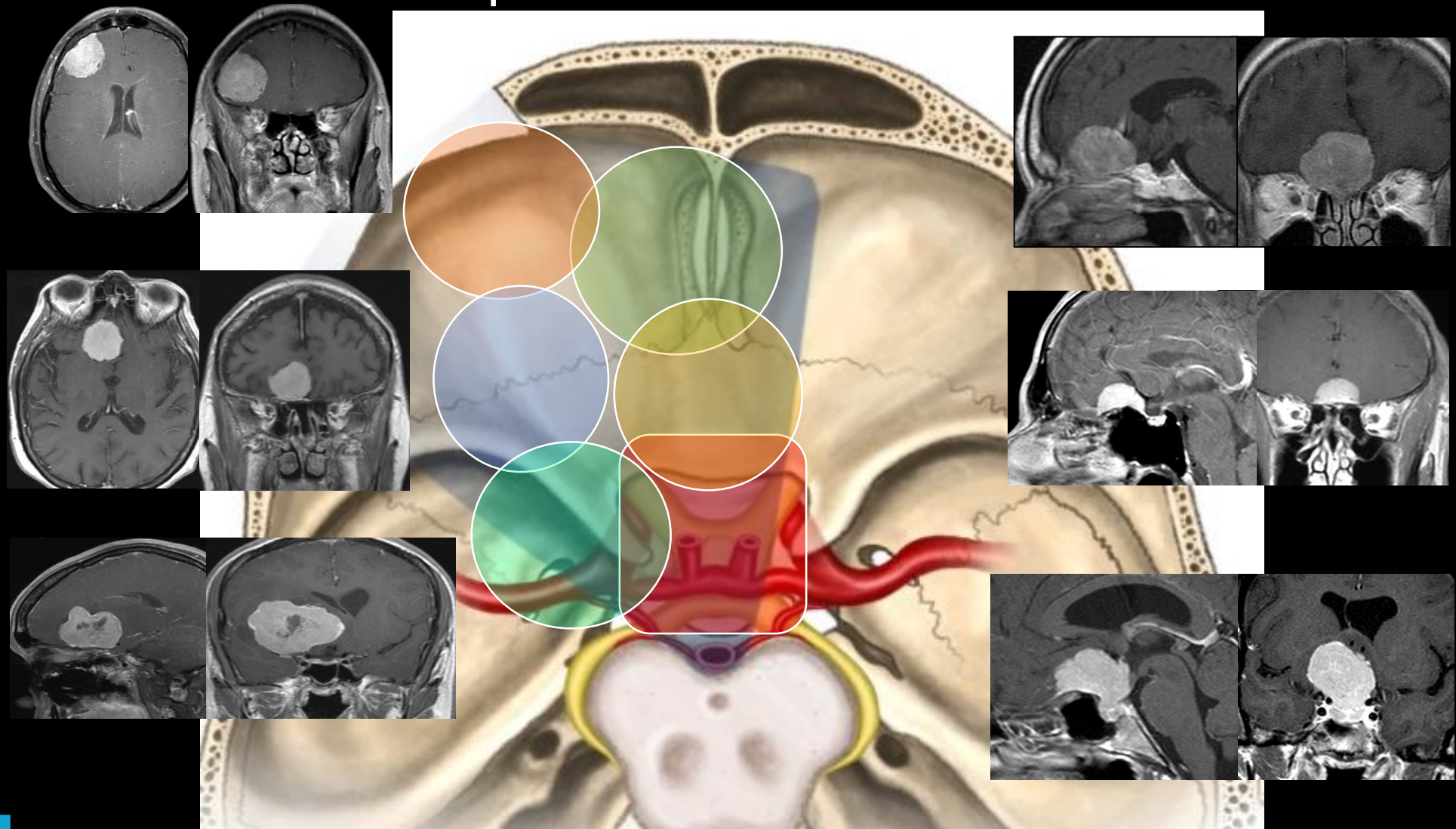
Supraorbital Eyebrow Craniotomy



- “Sweet-spot” of fronto-temporal craniotomy
- Allows keyhole retractor-less entry into frontal fossa
- View and access expanded with endoscopy



Meningiomas Accessible via Supraorbital Route



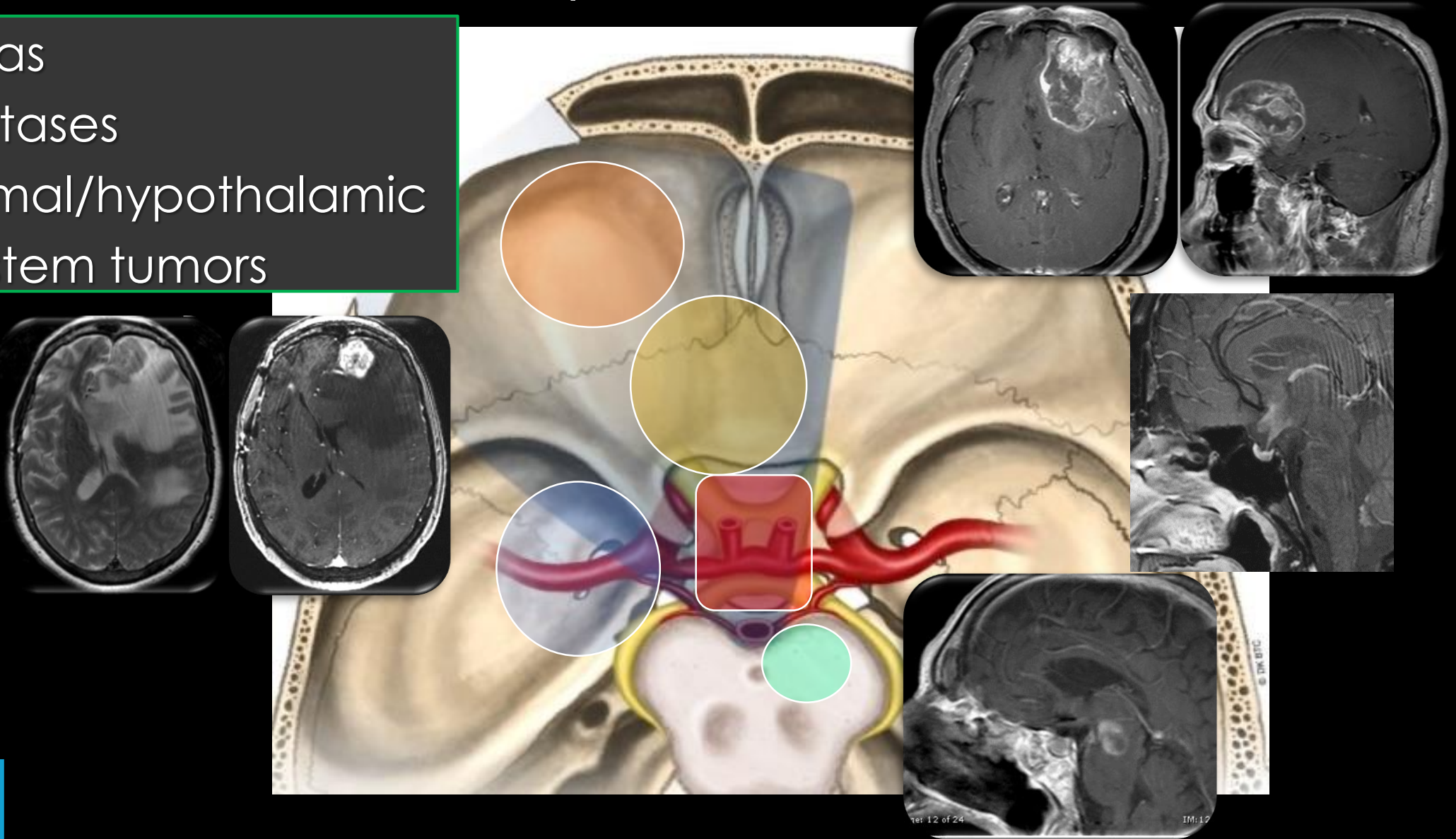
Intra-axial Brain Tumors Accessible via Supraorbital Route

Gliomas

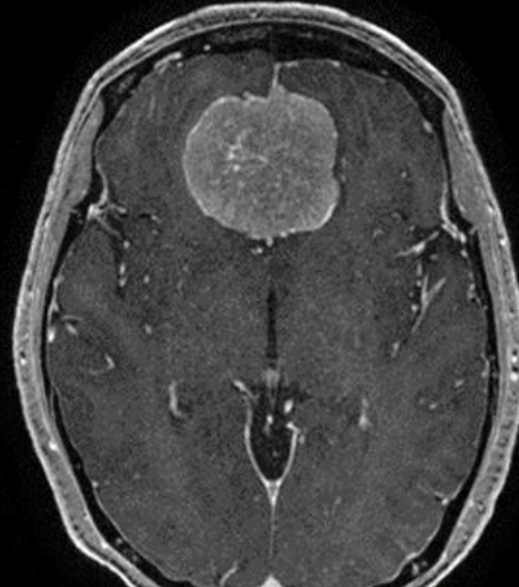
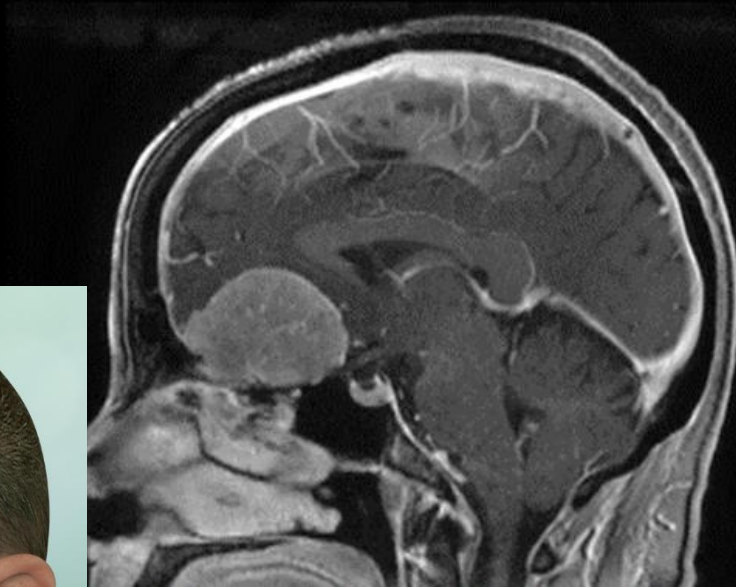
Metastases

Chiasmal/hypothalamic

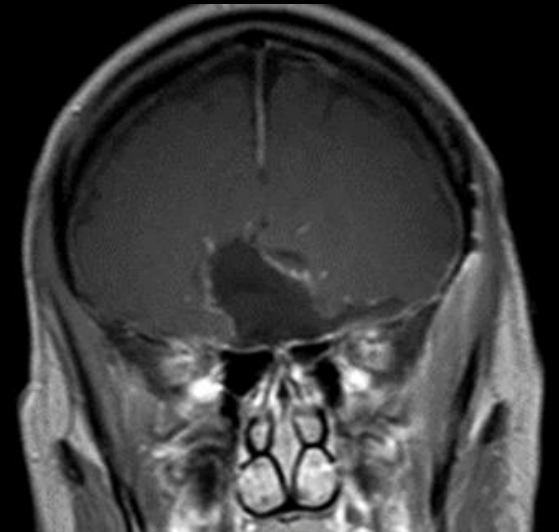
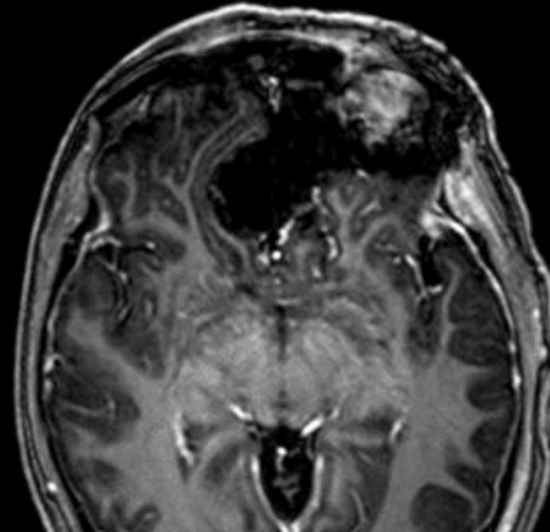
Brain stem tumors



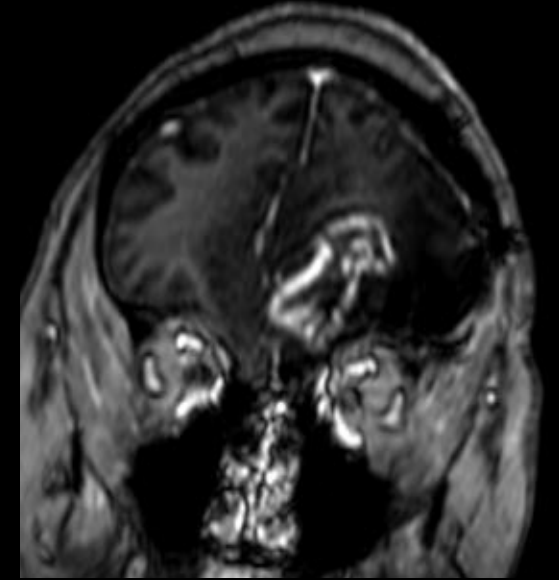
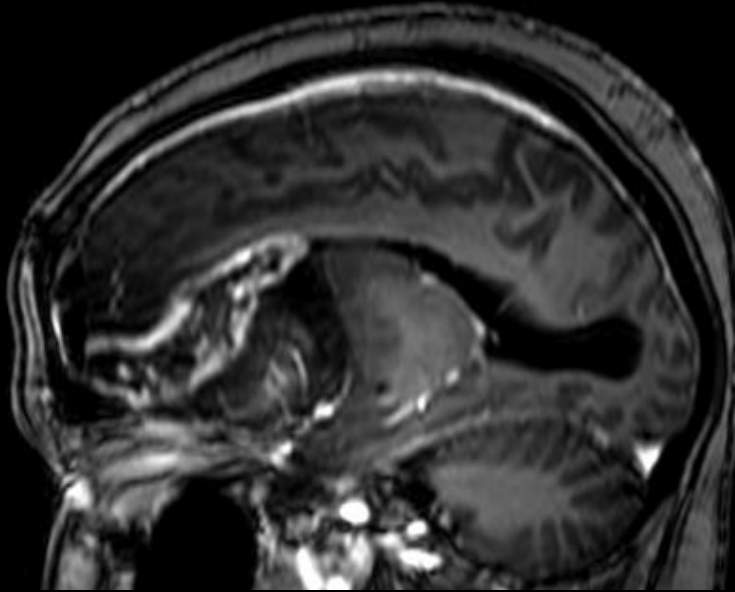
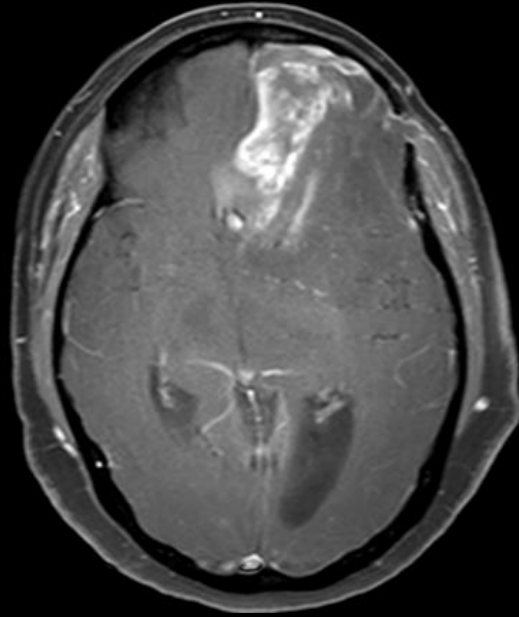
Olfactory Groove Meningioma Removed Through Left Eyebrow with Preserved Sense of Smell



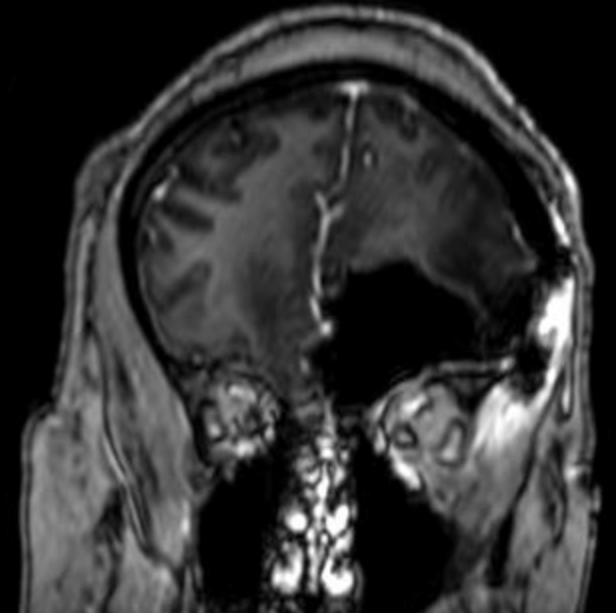
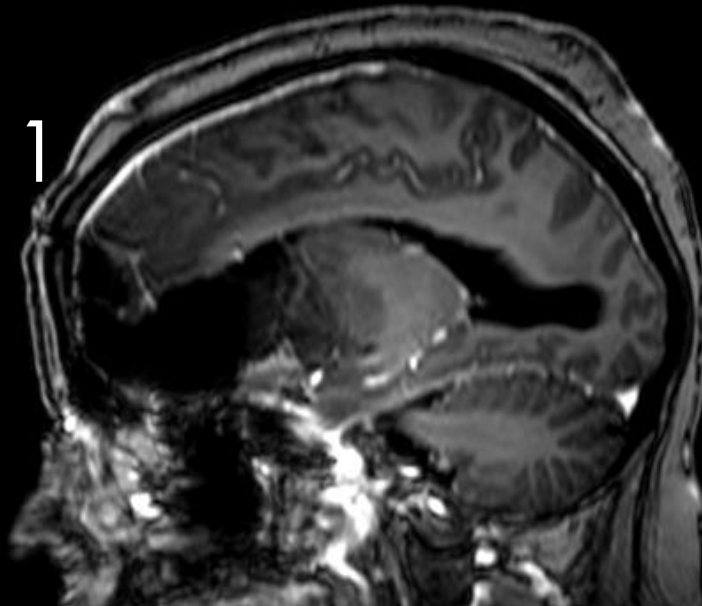
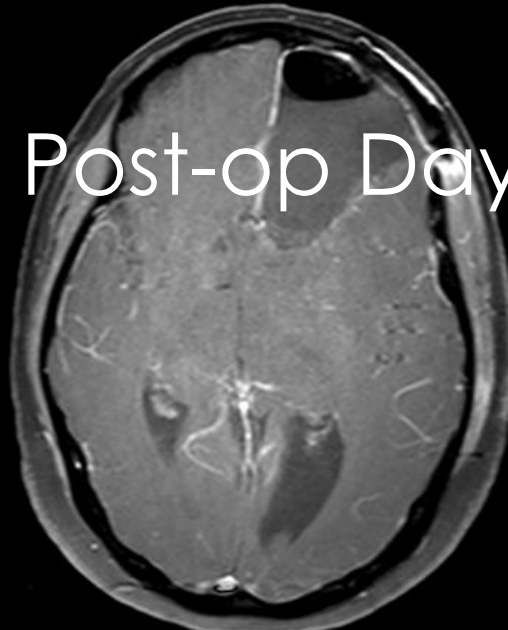
Post-op Day 1



Recurrent Glioblastoma Removed via Left Eyebrow



Post-op Day 1



Eyebrow Craniotomy Cosmesis

CASE SERIES

The Supraorbital Eyebrow Craniotomy for Intra- and Extra-Axial Brain Tumors: A Single-Center Series and Technique Modification

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BACKGROUND: The supraorbital (SO) eyebrow craniotomy provides minimally invasive access to the anterior and middle fossae and parasellar region.

OBJECTIVE: To present a series of patients treated with the SO approach to assess outcomes, the impact of endoscopy, and describe a modified pericranial flap aimed at reducing postoperative frontalis paresis and hypesthesia.

METHODS: A retrospective analysis was undertaken of our prospective database of patients who underwent SO craniotomy for tumor/cyst removal. Patients were evaluated based on pathology, utility of endoscopy, extent of resection, complications, and functional/esthetic recovery.

RESULTS: From 2007 to 2018, 129 operations were performed in 117 patients (54% women; mean age 60 ± 16.5 yr). The most common lesions were meningiomas (43%), gliomas (15%), and metastases (15%). Prior surgery and/or radiation had been performed in 37% and 26% of patients, respectively. Endoscopy was used in 76 (61%) operations and allowed more complete tumor removal in 38 (50%). For first-time operations, gross-total removal was achieved in 78%. Major complications included stroke (3%), cranial nerve deficit (3%), acute hematoma (1%), and cerebrospinal fluid leak (1%). The modified pericranial flap technique used in 18 recent patients resulted in a shorter duration of transient frontalis paresis and forehead hypesthesia with complete functional recovery in all 18.

CONCLUSION: The SO craniotomy is an effective keyhole approach for intra- and extra-axial tumors. Endoscopic assistance may allow additional tumor removal in almost 30% of the cases. The modified pericranial flap appears to accelerate functional recovery, although additional patients and follow-up are required to better assess this technique.

KEY WORDS: Keyhole approach, Minimally invasive, Outcomes, Supraorbital eyebrow craniotomy, Brain tumor, Craniopharyngioma, Endoscopy, Glioma, Meningioma, Metastasis, Supraorbital craniotomy

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