

Neurosurgery: Precision, Function & Innovation

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Definition of Neurosurgery

- Diagnosis & surgical treatment of CNS, Spine & PNS
- Brain, spine, peripheral nerves
- Combines imaging + precision surgery

Why Neurosurgery Matters

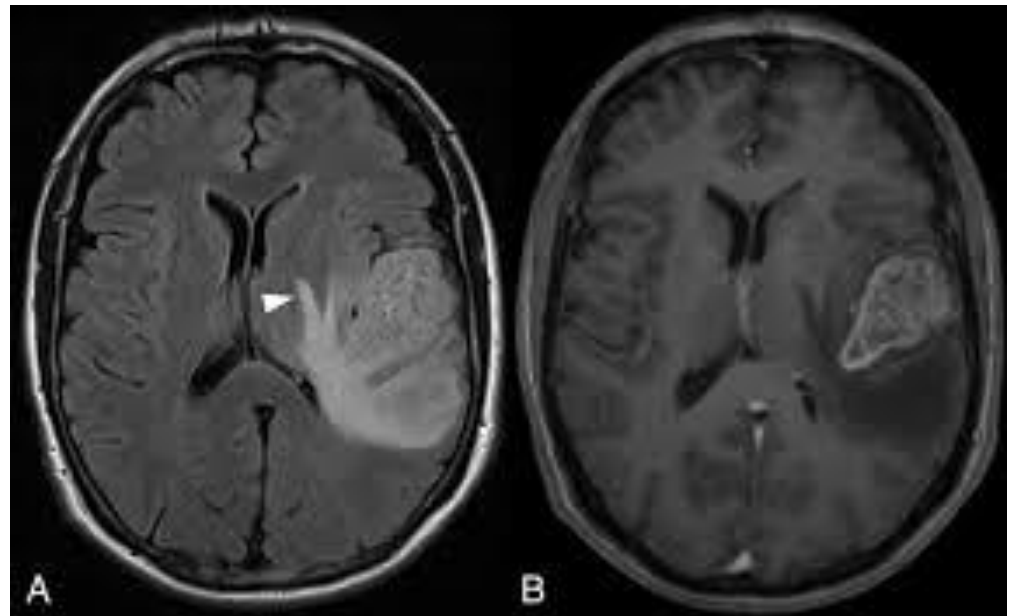
- Time = Brain / Spinal Cord
- High-impact life-saving interventions
- Restores function, not just survival

Main Subspecialties

- Neuro-oncology
- Vascular
- Spine
- Functional
- Pediatric
- Skull Base

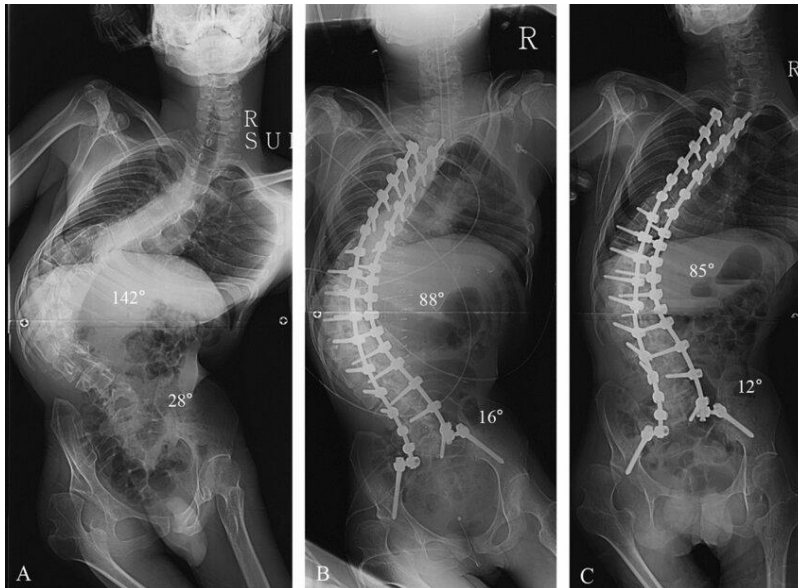
Neuro-Oncology

- Glioma, meningioma, metastasis
- Principle: maximal safe resection
- Balance tumor removal vs function



Spine

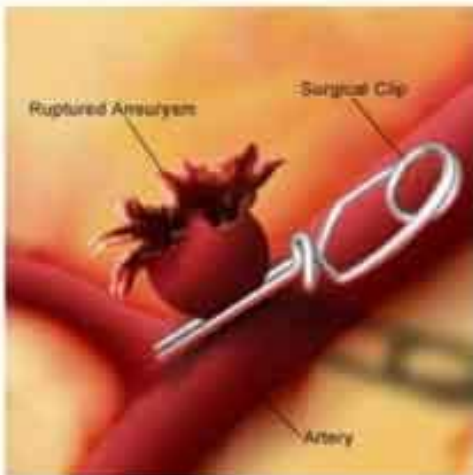
- Degenerative Spine like: disc herniation
- Trauma
- Tumors
- Deformities



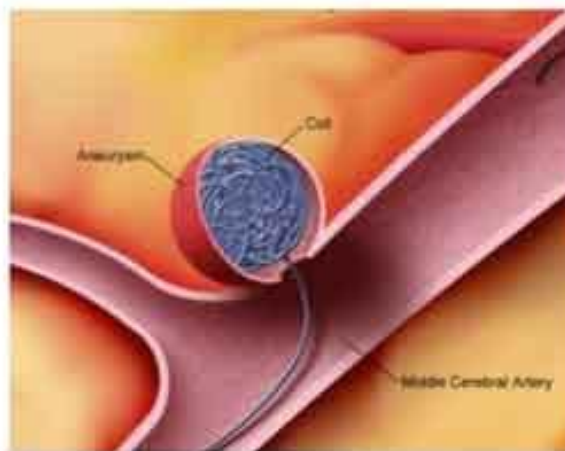
Vascular Neurosurgery

- Aneurysm, AVM, hemorrhage
- Clipping vs endovascular
- Emergency decision-making

Clipping

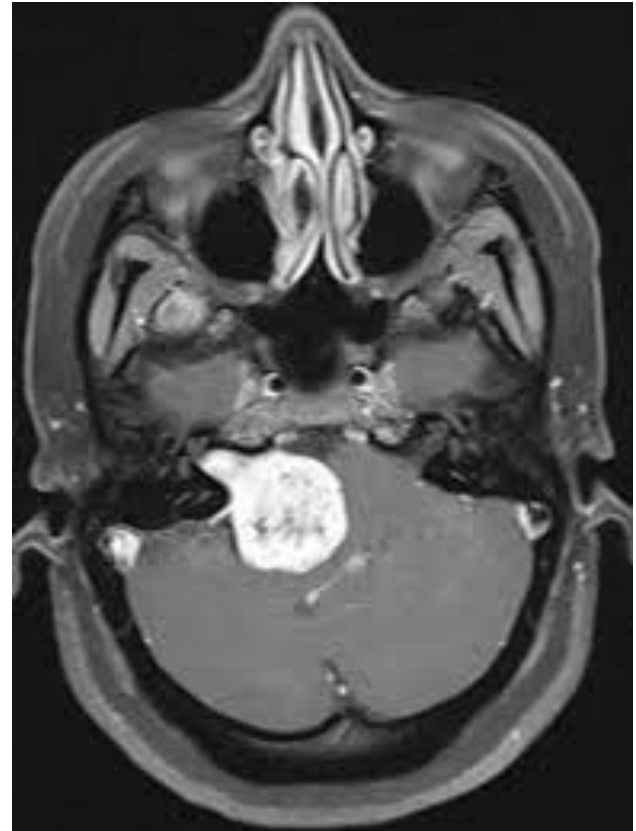


Coiling



Skull Base Surgery

- Tumors near cranial nerves
- Complex anatomy
- Multidisciplinary approach

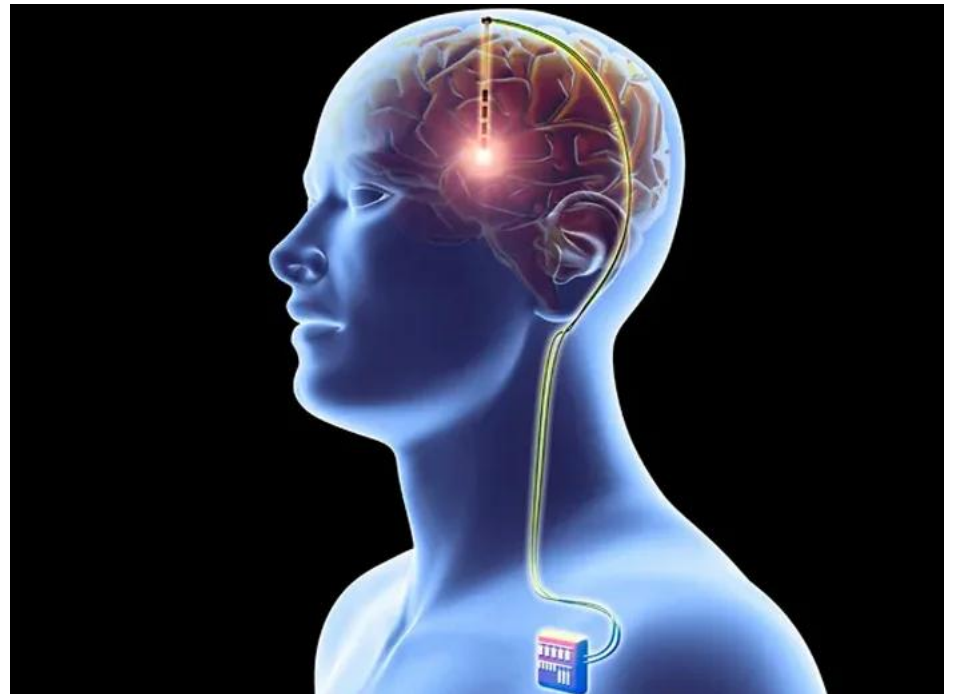


Functional Neurosurgery

- Treats circuits not lesions
- Parkinson's, tremor, epilepsy
- Precision targeting

Deep Brain Stimulation

- Electrodes in deep nuclei
- Adjustable & reversible
- Improves motor function



Epilepsy Surgery

- Drug-resistant epilepsy
- Resection or disconnection
- Goal: seizure freedom



Pre-Surgical Evaluation

- MRI
- EEG / Video EEG
- Neuropsychology
- PET/SPECT

Imaging in Neurosurgery

- CT: bleeding, trauma
- MRI: tumors, spine
- Essential for decision-making



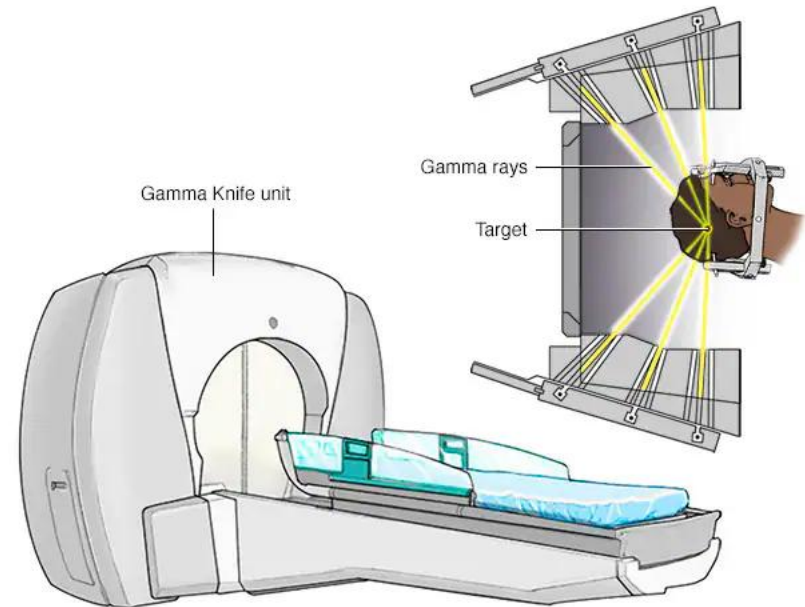
Stereotactic Neurosurgery

- 3D coordinate targeting
- Millimetric precision
- Foundation of modern techniques



Gamma Knife Radiosurgery

- No incision
- Focused radiation beams
- High precision treatment



Treatment Principles

- Decompression
- Resection
- Stabilization
- Modulation

Modern Neurosurgery

- Microsurgery
- Minimally invasive
- Radiosurgery
- Image-guided surgery

Key Message

- Precision + Technology + Physiology
- Restore function
- Improve quality of life