

Microsurgical Technique

□ Definition

Microsurgical technique refers to [surgical procedures](#) performed under high magnification using an operating microscope and specialized fine instruments. It enables precise manipulation of delicate neurovascular and parenchymal structures, essential in neurosurgery, otology, ophthalmology, and reconstructive surgery.

□ Core Elements

- **Operating microscope:** High-resolution, variable magnification with coaxial illumination.
- **Microsurgical instruments:** Fine-tipped dissectors, microforceps, scissors, bipolar forceps.
- **Microsutures** and microvascular clamps in vascular procedures.
- Use of **neuronavigation**, **neurophysiological monitoring**, and **high-speed drills** when indicated.

□ Principles in Neurosurgery

- **Atraumatic dissection** and preservation of normal neurovascular structures.
- Maintenance of **clear surgical planes**, often subarachnoid or subpial.
- Precise **hemostasis** using bipolar coagulation.
- Use of **CSF drainage** and **brain relaxation techniques** to avoid retraction injury.
- **Dynamic retraction** with suction or handheld instruments rather than fixed blades.

⚙ Applications

- [Tumor resection](#): gliomas, meningiomas, schwannomas.
- [Vascular surgery](#): aneurysms, AVMs, bypasses.
- [Skull base surgery](#): anterior, middle, posterior fossa.
- [Epilepsy surgery](#): temporal lobectomy, selective amygdalohippocampectomy.
- [Spine microsurgery](#): herniated discs, intradural tumors.

□ Advantages

- Enhanced **visualization and precision**
- Minimizes **neural trauma**
- Enables **complex resections or reconstructions** with low morbidity
- Facilitates **neurovascular preservation**

⚠ Limitations and Challenges

- Requires extensive **training and dexterity**
- Prolonged operating times in certain cases
- High initial investment in **equipment and infrastructure**

📖 References

- Yasargil MG. Microneurosurgery. Thieme.
- Spetzler RF, Kalani MYS. The Techniques of Microsurgery in Neurosurgery. Thieme.
- Rhoton AL. Cranial Anatomy and Surgical Approaches. Neurosurgery, Supplement 1, 2003.

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