Skills-Based Fellowship in Skull Base and Microneurosurgery

Overview

Skull base surgery is a highly specialized area of neurosurgery focused on the management of tumors and vascular lesions in the confined and complex region at the base of the skull beneath intertwined with critical neurovasculature, present a unique challenge due to their deep location surrounded by brain, bone, nerves, and blood vessels. Highly specialized training and an exacting understanding of three-dimensional microsurgical anatomy are required to perform safe and effective surgery within these microscopic corridors.

The Weill Cornell Fellowship in Skull Base and Microneurosurgery lasts 6 to 12 months, is tuition-free, and is open to surgeons worldwide, from senior residents to practicing neurosurgeons. The fellowship is lab- and skills-based, within the Weill Cornell Neurosurgical Innovation and Training Center (NITC), and designed to provide fellows with an exhaustive understanding of surgical approaches to the cranial base. Instruction centers around supervised, independent, and slow, meticulous cadaveric dissection following our core tenets and surgical philosophy. All training is closely supervised and administered by experienced faculty and follows a standardized sequential dissection curriculum covering the entirety of the skull base.

Curriculum

The program consists of an initial 3 months of systematic training in skull base surgical anatomy, followed by 3 to 9 months of training in skull base surgical approaches and techniques. Concurrent research opportunities are available starting in the fourth month, with junior resident teaching incorporated as appropriate after the fourth month.

The initial dissection curriculum is divided into two main blocks lasting a total of 3 months, comprised of extradural skull base (7 weeks) and intradural skull base/cisternal (5 weeks). Each block is subdivided into weeks dedicated to specific regions, beginning anteriorly and working posteriorly, wherein fellows identify a series of boney, neurovascular, and soft tissue structures, as well as key surgical landmarks. The first week is devoted to meticulous dissection of the orbit and the careful removal of all periorbital fat, while preserving all intraorbital structures. This gives fellows the opportunity to practice working under the surgical microscope, honing their microdissection skills, and lays the foundation for the expected pace of dissection going forward. From there fellows proceed posteriorly to the superior orbital fissure, middle fossa, cavernous sinus, anterior petrous bone, posterior petrous bone, posterolateral upper cervical region and craniocervical junction, lateral upper cervical region and extracranial jugular foramen, and infratemporal and pterygopalatine fossae.

The subsequent 5-week intradural block then begins, again anteriorly, with opening of the sylvian fissure and proceeds with exploration of the sellar and parasellar regions, retrosellar area, tentorial incisura, perimesencephalic region, cerebellopontine angle and midpetroclival region, foramen magnum and intracranial jugular foramen, pineal region, and the ventricular system.

Following the initial 3-month period of anatomic dissection, the curriculum shifts to technique-based instruction for the remainder of the fellowship, where the full scope of skull base surgical approaches, maneuvers, and techniques are performed simulating live surgery, and under close

direct faculty supervision. This encompasses anterior, anterolateral, lateral, and posterolateral approaches and their variants and associated maneuvers; combined skull base approaches; endoscopic transsphenoidal approaches; endoscope-assisted skull base techniques; lesion-specific approach selection; and targeting and tailoring of approaches and corridors.

Meticulous and relaxed dissection and independent exploration are essential for enhancing mental spatial memory and object-location associations, allowing fellows to develop a comprehensive mental anatomical map of the entire skull base. Note taking is expected during and after each dissection. The initial phase of the curriculum promotes exploration while avoiding recipe-like learning—with the aim of fostering understanding of the underlying rationale behind each step rather than solely technical mastery, thereby cultivating independent, adaptive surgical judgment.

Fellow Responsibilities

At the end of each week, fellows are expected to prepare a short presentation consisting of sequential photos from their dissection and the related anatomy, during which the faculty and fellows discuss the steps the fellow undertook during their dissection in order to understand their approach and thought process. These sessions emphasize critical problem-solving and reflective analysis rather than a focus solely on anatomical details and technical execution, enabling the early detection and remediation of any knowledge or skill deficiencies—we seek to understand fellows thinking and rationale on the steps they choose to take.

Fellows are expected to participate in and assist with NITC activities, including educational initiatives; maintain overall lab cleanliness; respect and use all NITC equipment and instrumentation with care; and follow all NITC guidelines and procedures.

Additionally, fellows are responsible for maintaining the cleanliness of their assigned workstation and any equipment, tools, or materials used. Workstations should be cleared of instruments and discarded materials at the conclusion of each dissection, and each station must be fully cleaned at least once per week in accordance with NITC policies.

Schedule

Fellows are expected to spend at least 5–6 hours per day dissecting. Specific work hours are at the discretion of each fellow, but those hours should at least in part overlap with normal business hours to allow for faculty oversight. However, as the NITC operates 24/7, fellows may choose to work at the times they find most conducive to their learning. During periods of peak operation, fellows may be assigned specific schedules, which will be determined during orientation. Physical directions to the NITC will be emailed to you prior to your start date.

For directions to the hospital visit http://nyp.org/facilities/weillcornell.html.

Requirements for Completion

Completion of the fellowship is contingent upon meeting all program requirements and performance standards. Participation alone does not constitute completion. Fellows who successfully fulfill the full scope of the curriculum and demonstrate competency to the program's established standards will receive a formal diploma certifying completion of the fellowship. Fellows who do not meet these requirements will instead receive documentation verifying their period of attendance.

Eligibility and Admissions

Applicants must be senior residents in neurosurgery or practicing neurosurgeons, from any country, who are willing to commit to at least 4 months of training. Applicants must also possess or be eligible for a United States B1/B2 Visa.

Fellows are admitted based on their background and experience. Applications are accepted on a rolling basis, with preference given to applicants who serve the most underserved patient populations. Prospective fellows should submit applications at least 6 months in advance their requested start date.

Program Costs

There is no cost to complete the fellowship training program; however, fellows are required to purchase their own cadaveric specimen at a cost of $1,500 and pay a $200 medical clearance fee to Weill Cornell Medicine.

Resources

Your hospital ID badge entitles you access to the Weill Cornell Medical College Library, located at just inside the 1300 York Avenue entrance, and all of its resources. This will give you access to over 7,000 electronic journals, over 2,500 electronic books, and over 100 databases. Computers are also available for use. For more information on the library, its hours, and its resources visit http://library.med.cornell.edu/. NITC computer workstations also provide access to these resources.

Primary Point of Contact

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