



Innovative,
Visionary,
World-Class
Care



SKULL BASE INSTITUTE

Center for Excellence in Skull Base Surgery

For decades, the skull base has represented a virtual “no-man’s land” in terms of surgical treatment. The area is extremely difficult to navigate -- due to the numerous vital blood vessels and critical cranial nerves that enter and exit the base of the brain.

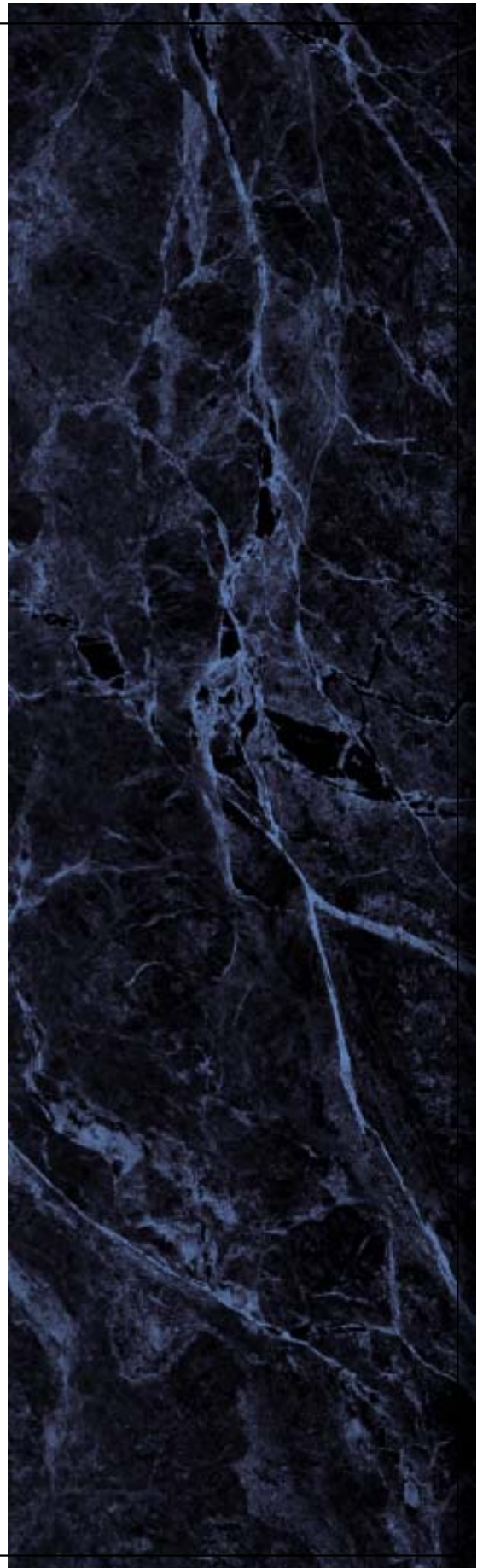
Treating conditions enmeshed in such complex human anatomy requires innovation –innovation you will find at The Skull Base Institute. Specialists at the Skull Base Institute have pioneered minimally invasive techniques that have attracted world-wide attention, enhancing the lives of thousands of patients.

Our renowned surgeons treat such complex conditions as pituitary tumors, congenital craniofacial deformities, microvascular nerve compression syndromes, cranial extensions of head and neck cancers, acoustic neuromas, meningiomas, chordomas and a variety of brain and skull base tumors.

A New Generation of Pioneers

Perhaps the most distinguishing characteristic of The Skull Base Institute is its commitment to minimally invasive surgery. The Institute has the world's most experienced surgical team, a team that has performed thousands of endoscopic microsurgical procedures for the treatment of skull base disorders including a variety of brain tumors. Techniques developed by the Institute’s surgeons have been popularized around the world, advancing the specialty of skull base surgery internationally.

Hrayr K. Shahinian, MD, the director of the Skull Base Institute, brings a unique expertise to the Institute. He is among the first to utilize endoscopic procedures to reach tumors and other growths at the base of the skull. His "hybrid" background, which includes extensive training in skull base surgery, plastic and reconstructive surgery and craniofacial surgery, makes him uniquely qualified to head this dynamic Center of Excellence.



Minimally Invasive Skull Base Surgery

Endoscopic skull base surgery offers dramatic benefits to patients. Using extremely thin, flexible and precise endoscopic instruments, these minimally invasive approaches eliminate large craniotomies, scarring and nasal packing. They shorten surgery time, dramatically reduce length of stay in the hospital, and result in faster overall recovery, return to work and normal activities. These facts have been published in numerous peer-reviewed journals and have been quoted extensively.

Endoscopic Pituitary Surgery

One of the most extraordinary advances pioneered at the Skull Base Institute is the minimally invasive, fully endoscopic approach to treating pituitary tumors (pituitary adenomas) and other skull base disorders. This innovative procedure utilizes a tiny endoscope - 2.7 mm wide and 20 cm long - with angled tips that is inserted through the nostril and into the skull base. This technique offers numerous advantages in terms of the surgery and recovery.



Endoscopic Pituitary Surgery

One of the amazing benefits is the view of the surgical field. Since the camera is "placed" at the tip of the endoscope, surgeons have a vivid panoramic view of the brain. They can look around corners and make a full visual assessment. This panoramic view also provides surgeons with the ability to remove the entire tumor in most cases. This process is in sharp contrast to the traditional approach, which requires viewing the tumor site through a microscope outside the skull at a focal distance that limits visibility.

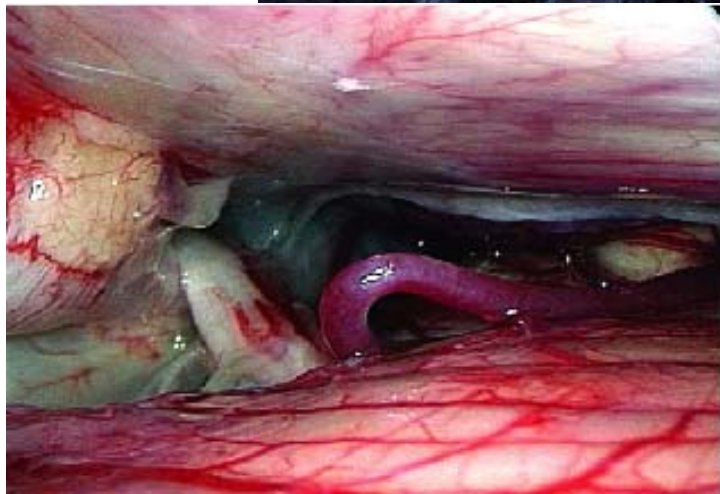
Since the point of entry is through a nostril, no incision is required. Consequently, there is no scarring, no nasal packing, and the brain is undisturbed. The time required for the actual surgical procedure, the length of hospital stay and overall recovery time are dramatically reduced. Patients return home within 24-48 hours of surgery, enjoy a rapid overall recovery, and return to work and normal activities.

Endoscopic “Keyhole Approach” for Severe Facial Pain

The endoscope is also being used at the Skull Base Institute to treat trigeminal neuralgia, or severe facial pain. This condition is universally acknowledged as the most painful affliction known to adult men and women and affects thousands of Americans each year. The episodes of intense, stabbing, electric shock-like facial pain are caused when a blood vessel comes in contact with the fifth cranial (trigeminal) nerve, applying pressure to the nerve. The shock of this excruciating pain can actually cause a sufferer’s head to snap back, or it can immobilize the individual. The pain attacks viciously and without warning. Left untreated, trigeminal neuralgia tends to worsen over time.

Patients with neurovascular problems such as trigeminal neuralgia – as well as hemifacial spasm, intractable vertigo associated with Meniere’s disease and spasmodic torticollis – benefit from the Skull Base Institute’s innovative endoscopic “keyhole” approach to these disorders. At the Institute, surgeons perform this delicate microvascular decompression procedure through a dime-size opening behind the ear. Through this opening, surgeons insert a 2.7 mm endoscope. They can then identify the problem and perform the procedure – meticulously separating the nerve and blood vessel, and inserting a Teflon disk between them. Once the pressure has been relieved, patients often report immediate and complete relief from the pain.

In many cases, the endoscopic “keyhole” surgery is the preferred approach to traditional methods, in which instruments are inserted in a larger opening behind the ear, and the brain pushed aside to reach the nerve compression area.



Vascular Loop Compression Left Trigeminal Nerve



Post Endoscopic Microvascular Decompression with Teflon

Endoscopic Acoustic Neuroma Surgery

An acoustic neuroma is a benign tumor of the eighth cranial

nerve - the vestibulo-cochlear nerve that travels from the brain to the ear. It usually manifests itself with one-sided hearing loss. But other cranial nerves, particularly one affecting the face, are in close proximity. Therefore, while the tumors themselves are considered benign because they do not metastasize to other organs, they can cause serious complications and eventually death as they grow, exerting pressure on nerves and on the brain itself.



Endoscopic Acoustic Neuroma Surgery



3.5cm Acoustic Neuroma



Left Endoscopic Retroauricular Approach

To remove these tumors, surgeons have traditionally relied on one of two common approaches. The most frequently used procedure, the Translabyrinthine approach, involves several surgeons who drill through the mastoid bone behind the ear to access the tumor. For smaller tumors, the "retrosigmoid" or "sub-occipital" approach offers the possibility of saving some hearing. Instead of going through the mastoid bone, surgeons make a large incision behind the ear, open the skull behind the mastoid bone, push the brain aside, and take the tumor out.

At the Skull Base Institute, our surgeons have developed a fully endoscopic approach. Instead of drilling through the mastoid bone or cutting a large opening in the skull, our

surgeons make a burr hole the size of a dime behind the mastoid. From this point, thin and precise endoscopic instruments are inserted - slipping them between the brain and skull to the site of the tumor.

The entire procedure is performed using minimally invasive techniques and allows, in most cases, patients to be discharged within 48 hours. This is mainly attributed to the fact that the brain is not manipulated, retracted

or pushed resulting in lower complication rates and faster recovery times.

Endoscopic Craniopharyngioma Surgery

A craniopharyngioma is a benign tumor that develops near the pituitary gland. Craniopharyngiomas cause symptoms in three different ways: 1) by increasing pressure on the brain 2) by disrupting the function of the pituitary gland, and 3) by damaging the optic pathways.

Traditionally, open surgery has been the main treatment for craniopharyngiomas. However, at the Skull Base Institute, three different minimally invasive endoscopic procedures allow us to tailor the procedure depending on the size and location of the tumor. These include an endoscopic transnasal approach similar to that offered for pituitary tumors and two minimally invasive endoscopic approaches that involve placing a small incision either within the skin crease in the bridge of the nose (endoscopic frontal approach) or within the eyebrow (endoscopic supraorbital approach).

The endoscopic frontal approach for central lesions is continued by performing a 1.5 centimeter keyhole midline craniotomy. The endoscope is advanced along the floor of the anterior cranial fossa between the two frontal lobes directly to the tumor which is superbly visualized.

Craniopharyngiomas that extend laterally are approached through the most recent technical innovation at the Skull Base Institute, the endoscopic supraorbital approach. This fully endoscopic approach involves placing an incision within the hair of the eyebrow, performing a 1-1.5 cm keyhole supraorbital opening and advancing the endoscope along the floor of the anterior cranial fossa underneath the frontal lobe. This approach allows a panoramic visualization of the ipsilateral anterior fossa and a partial visualization of the contralateral anterior fossa.

Although most craniopharyngiomas are completely resected through one of these minimally invasive approaches, occasionally giant lesions may require a combination of the endoscopic transnasal approach with either the endoscopic frontal approach or the endoscopic supraorbital approach. This allows a complete and total resection of virtually most craniopharyngiomas through minimally invasive techniques.



Endoscopic Right Supraorbital Keyhole Approach



Craniopharyngioma

Minimally Invasive, Tailored Meningioma Surgery

Meningiomas are tumors that originate from the meninges, which are membrane-like structures that surround the brain and spinal cord. Typically they are benign and occur as solitary masses, but instances of malignancy and multiple concurrent lesions have been reported. About 15 to 20% of all primary brain tumors are meningiomas, and commonly occur in patients in their 40s

through 60s.

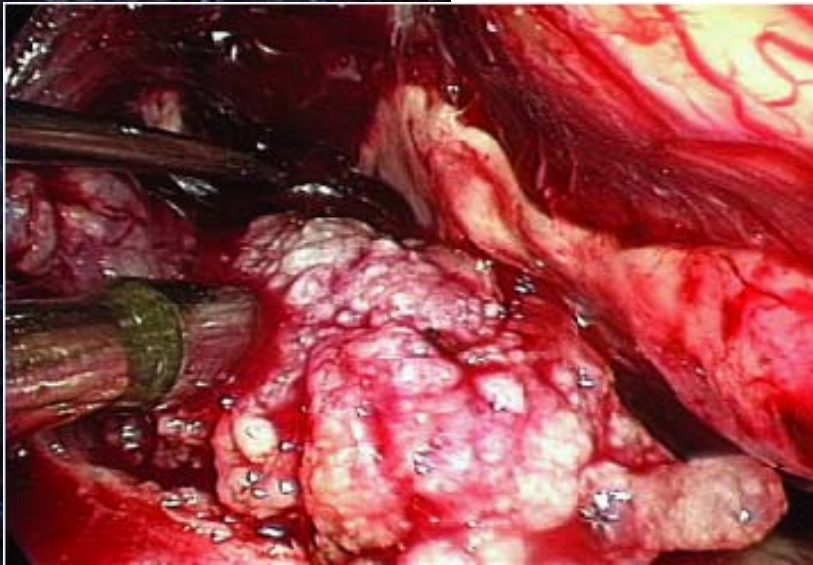
Since the meninges surround the entirety of the brain and spinal cord, meningiomas can occur anywhere in the central nervous system. Signs and symptoms depend on the size and location of the tumor. Symptoms usually develop as a result of compression of surrounding neurovascular structures.

Intracranial meningiomas may manifest as headache, stroke,

seizure, loss of vision, or personality change. Due to their slow growth characteristics, development and progress of symptoms can be subtle and extend over a period of years.

Treatment options are varied ranging from conservative expectant therapy to aggressive surgical resection. The goal of surgery is complete tumor removal. The technique employed depends on the location of the tumor.

Tumors once thought to be "unresectable" are now regularly and safely removed at the Skull Base Institute. Meningiomas located at the base of the skull are very difficult to access. Our use of highly specialized surgical techniques, sophisticated intraoperative monitoring equipment, and minimally invasive surgical instruments allow us to expose hard-to-reach areas in their entirety without disturbing surrounding critical neurovascular structures.



*Meningioma With Adjacent Normal
Brain Tissue.*

Compassionate, Knowledgeable Team

Skull base disorders are a complex problem that requires extensive surgical expertise – surgical expertise that is the hallmark of the Skull Base Institute. Additionally, the Skull Base Institute is staffed by knowledgeable, highly skilled teams of nurses, technicians and office staff members who ensure that patients receive individualized, compassionate care. The Operating Room team has worked together for several years, and is experienced at constantly performing at high levels of intensity.

Close Contact With Referring Physicians

Close contact is maintained between the Skull Base Institute and referring physicians, who are contacted immediately following surgery, and are kept up-to-date by phone, fax and letters. Once treatment is completed, patients are referred back to their physicians. Telephone consultations are also available and welcome.

Who is a Candidate for The Skull Base Institute?

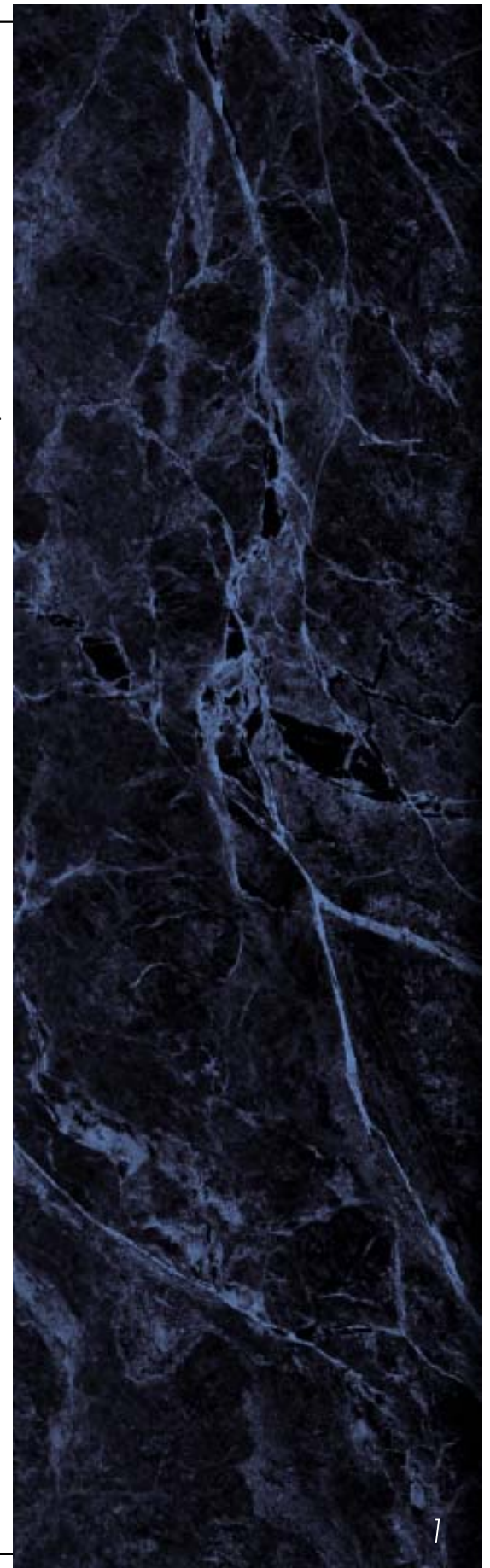
Adults with skull base and brain tumors including pituitary tumors, meningiomas, acoustic neuromas, craniopharyngiomas, chordomas, schwannomas, angiofibromas and esthesioneuroblastomas -- all benign and malignant brain and head and neck tumors that extend to and through the skull base.

Adults with trigeminal, facial, vestibular and cochlear nerve disorders such as trigeminal neuralgia, facial palsy, hemifacial spasm, vertigo associated with Meniere's disease, and pulsatile tinnitus.

Adults with cerebral aneurysms and arteriovenous malformations (AVMs).

Infants or children with congenital craniofacial deformities such as craniosynostoses, hypertelorism, Apert's syndrome, Crouzon's syndrome and Pfeiffer's syndrome.

Children and adults with complex skull base trauma including intra/extracranial facial and temporal bone fractures.



The Skull Base Foundation

The Skull Base Foundation is a non-profit entity dedicated to advancing research in minimally invasive skull base surgical techniques. The Foundation provides research grants to visionary investigators, and helps defray some of the expenses for underprivileged individuals who require skull base surgery.

Some of the most recent projects being funded by the Skull Base Foundation include:

Continually developing new endoscopic techniques to reach delicate areas of the brain. The endoscopic techniques currently being utilized for pituitary tumors and other cranial disorders are a direct result of bench research that was done at the Skull Base Institute.

Evaluating transplantation of fetal pituitary cells to enhance the function of the pituitary gland in patients after surgical removal or medical treatment of pituitary tumors.

About Hrayr K. Shahinian, MD, Director, Skull Base Institute

Hrayr K. Shahinian, MD, is Director of The Skull Base Institute. Prior to creating the Skull Base Institute on the West Coast in 1996, Dr. Shahinian served as Co-Director of the Skull Base Institute at the State University of New York at Stony Brook, and an Assistant Professor of Surgery and Neurosurgery.

Dr. Shahinian earned his bachelor's degree in biology and chemistry, and his medical degree from the American University of Beirut and the University of Chicago, both with distinction. He completed his surgery residency at Vanderbilt University Medical Center in Nashville, Tennessee and his plastic and reconstructive surgery residency at the Institute of Reconstructive Plastic Surgery at New York University Medical Center in New York, New York. He then completed two fellowships – the first in skull base surgery at the University of Zurich in Switzerland, and the second in craniofacial surgery at the Institute of Reconstructive Plastic Surgery at New York University Medical Center. He was recruited by Cedars-Sinai Medical Center in Los Angeles to head their newly formed Division of Skull Base Surgery.



Dr. Hrayr K. Shahinian

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