Minimally Invasive Endoscopic Resection of the Pituitary (MIERP)

**Patient Information**

**Introduction**

The pituitary gland is located at the base of the brain behind the sphenoid sinus and between the eyes. Minimally invasive endoscopic pituitary surgery is a technique that employs nasal telescopes (i.e. endoscopes) to go through the nose, open the sphenoid sinus, and create a small window in the base of skull where the pituitary gland is located. This approach avoids the need for any facial incisions. Three-dimensional stereotactic surgical navigation (i.e. image guidance) is often used during surgery to help provide a roadmap for the surgeons to access the tumor. Using sophisticated computer technology in the operating room, this roadmap is created by a combination of sinus CT scans and brain MRIs that are obtained prior to the surgery. Minimally invasive endoscopic resection of the pituitary (MIERP) expands upon the techniques that are routinely used during functional endoscopic sinus surgery (FESS) for the treatment of chronic sinusitis. Today, by using meticulous technique in the operating room and during post-operative care visits, healing is quicker and overall outcomes are improved.

The nasal endoscope is a small metal rod that contains light and optical fibers. It is connected to a camera and allows the surgeons to visualize your sinus cavities and pituitary through your nose. Small endoscopic sinus instruments are then inserted through the nostrils to perform the surgery in the region of the pituitary. No facial incisions are made during the surgery. The nasal endoscope provides brilliant illumination and allows for the surgeons to look at various angles. Traditional trans-septal trans-sphenoidal (TSSH) pituitary surgery is performed through incisions under the lip or inside the nose and microscopes are to visualize the pituitary through retractors inserted through these incisions.

Surgery through the nostrils requires two surgeons--a neurosurgeon and an otolaryngologist (ENT) surgeon. Each surgeon has a set of surgical skills that are necessary to perform the operation and resect the tumor. The surgeons work together through each nostril in a 4-handed technique. This allows for the introduction of the nasal endoscope with a camera and multiple surgical instruments at the same time.

**How will I be evaluated for MIERP?**

Once the tumor has been detected on MRI, most patients will also undergo an endocrine (hormone) evaluation and ophthalmology (eye) evaluation as directed by the neurosurgeon. They will then be seen by the ENT surgeon to evaluate the sinus CT scan and sinus anatomy. A nasal endoscopic exam will also be performed pre-operatively in the office by the ENT surgeon to evaluate the feasibility of the surgical approach and to evaluate for any chronic sinusitis or nasal allergy history. Once these evaluations are completed the patient will be scheduled for the operating room at Morristown Medical Center.

**What will happen in the operating room and after surgery?**

All MIERP procedures are performed under general anesthesia in the operating room. The surgery will begin once the anesthesiologist has administered the anesthetic medications. A foley catheter (bladder catheter) is placed once the patient is asleep to help monitor the body’s fluid balance.

The surgical plan will be discussed in the office during your pre-operative visit; however, intra-operative findings may require adjustments to the surgical plan to help maximize your results. Everything possible is done to help anticipate these adjustments in advance of your surgery. However, certain decisions can only be made at the time of surgery.
If a brain fluid leak (CSF leak) is encountered in the operating room during removal of the tumor, it is repaired at that time. Sometimes this involves use of native tissue or medical grade biologic graft material to resurface the defect and seal the CSF leak. Sometimes this involves using a small amount of fat harvested from the lower belly to form a plug. In some instances, a lumbar drain needs to be placed in the lower back by the neurosurgeon to help divert fluid (CSF) from the repair site. On some occasions it may be necessary to place traditional nasal packing in your nose at the completion of surgery. This will stay in place for a certain number of days depending upon the intra-operative findings and post-operative recovery. Some patients may be discharged from the hospital with the packing still in place and will have it removed by the ENT surgeon at the first post-operative visit.

After the operation is completed the patient is transferred to the recovery room and ultimately the surgical intensive care unit (SICU) for monitoring. The foley catheter remains in place until the urine output normalizes. The patient will remain on bedrest until the surgeons determine it is appropriate to get out of bed and ambulate. This can be as short as 24 hours and as long as a few days depending upon the surgery. Stay in the SICU can be as short as 24 hours and as long as a few days. Overall stay in the hospital can be as short as 2 days and as long as a few days depending upon surgery, recovery, and other medical factors. While in the hospital you will be under the primary care of your neurosurgeon.

How do I prepare for MIERP?

- A history and physical exam will be performed. If chronic medical conditions exist, a letter of medical clearance will be requested from your primary medical physician.
- Blood work, chest X-ray, EKG, and other tests may be required depending on your health.
- A recent CT scan of the sinuses will be obtained and reviewed.
- A recent MRI of the brain will be obtained and reviewed.
- Do not eat or drink anything after midnight the night before surgery. If you are taking medication, please ask during your pre-operative visit if these pills may be taken the morning of surgery.
- Do not take aspirin or salicylate containing medications for at least 10 – 14 days prior to surgery. These medications increase the risk of bleeding.
- Do not take non-steroidal anti-inflammatory (NSAIDS) medications (i.e. Ibuprofen, Advil, Motrin, Aleve, Naprosyn, etc.) for at least 7 days prior to your surgery. These medications increase the risk of bleeding. It is okay to take Tylenol (acetaminophen) as needed for headache or pain.
- If you are taking blood thinners (Aspirin, Plavix, Coumadin, Lovenox, Eliquis, Pradaxa, Xarelto, etc.), on the recommendations of a physician, they will need to be stopped in advance of your surgery. The timing of this should be discussed with your surgeons and the prescribing medical physician.
- Do not take any supplements or herbal remedies that may increase your risk of bleeding (Garlic, Vitamin E, Ginkgo, Ginger, Sal Palmetto, etc.) for at least 7 days prior to your surgery. Alcohol is dehydrating and increases your risk of bleeding.
- Avoid cigarette smoking. If you smoke, please do your best to quit or at least significantly limit your cigarette usage 2 to 3 weeks prior to your surgery. Tobacco smoke is known to increase the risk of anesthesia and may adversely affect post-operative healing.
What are some of the possible risks and complications of MIERP?

- **Bleeding.** Any surgical endeavor carries the risk of bleeding due to manipulation of the native tissue and operating near and around blood vessels. Significant bleeding may require termination of the procedure, nasal packing, and/or hospitalization. A blood transfusion is very rarely necessary. Minor bleeding (oozing) for a few days after the surgery is considered normal.

- **Infection/Meningitis.** Any surgical endeavor carries the risk of infection due to manipulation of the native tissues and communication between the brain and nose that is created during surgery. If an infection develops after surgery, it will be treated with appropriate antibiotics.

- **Pain.** Any surgical endeavor carries the risk of pain. Pain medication is typically prescribed in the hospital and after discharge to help with pain. Often acetaminophen (Tylenol) is sufficient for pain after discharge from the hospital.

- **Cerebrospinal Fluid (CSF) leak.** CSF is fluid that surrounds the brain tissue. The brain sits above the ethmoid and sphenoid sinuses and behind the frontal sinuses. Breach of these boundaries may result in leakage of CSF into the nose. If this complication occurs, a pathway for the spread of infection from the nose to the brain may be created, possibly leading to meningitis (brain infection). Today, most CSF leaks are repaired using the nasal endoscope during the time of pituitary surgery. If this complication occurs, additional hospitalization and surgical procedures may be required, although it may close spontaneously with bedrest.

- **Stroke.** Any surgical endeavor in and around the brain carries the risk of stroke. This can be due to manipulation of blood vessels around the pituitary or bleeding in and around the brain. This is a very rare complication of MIERP.

- **Visual damage.** The eyes rest above the maxillary sinuses and next to the ethmoid sinuses. The optic nerve, which controls vision, travels adjacent to the sphenoid sinus and pituitary gland. There have been occasional reports of damage to the orbit, eye, and optic nerve(s) including loss of vision on one side or double vision.

- **Persistent tearing (epiphora) from injury to the tear duct.** The tear duct (lacrimal system) lies in close proximity to the sinuses. Inadvertent damage to the tear duct system may cause blockage and persistent tearing that may require additional surgical procedures to repair, although it usually resolves spontaneously without surgery.

- **Decreased sense of smell and taste.** Sense of smell is directed by the olfactory nerves that send small nerve fibers to the nasal septum. Portions of the posterior nasal septum are removed during surgery to allow access to the tumor through each nostril. It is possible for the sense of smell and taste to decrease or become permanently absent.

- **Anesthesia risks.** MIERP is performed under anesthesia and carries its associated cardiac (heat), pulmonary (lung) and intubation (insertion of breathing tube) risks. Any history of adverse reactions to general anesthesia should be discussed with the anesthesiologist.

- **Change in voice.** This may be due to change in airflow through your nose after the surgery that affects the quality and character of your voice.

- **Temporary numbness, discomfort, swelling, or bruising of the upper lip, cheek, or teeth (or around any external incisions).** These rare symptoms are usually temporary, but in some patients, they may be permanent.

- **Temporary swelling or bruising around the eye.** These rare symptoms are usually temporary, but in some patients, they may be permanent.
**Scarring.** A scar will result if an external incision is made on the skin. These incisions are often placed in cosmetically acceptable areas, but in some instances may result in noticeable scars. Scarring can also occur in the nose and sinuses resulting in nasal obstruction, crusting, bleeding, and sinus infections. Surgical techniques and post-operative sinus debridements are utilized to help mitigate these complications.

**Need for additional surgical or medical interventions.** Additional surgical procedures may be necessary in the future to help maximize your long-term results. Each patient’s individual healing process cannot be predicted in advance, and the severity of tumor, operative findings, and post-operative healing differs from patient to patient.

**What will happen after hospital discharge?**

After discharge from the hospital you will be on oral antibiotics for 10-14 days from the date of your surgery, and sometimes longer depending upon findings at the time of surgery. You will continue nasal saline spray 2-3 sprays each nostril 4 times per day. Sometimes you may be also discharged home on stool softeners.

You will be seen by your ENT surgeon approximately 10-14 days after the date of your surgery to perform endoscopic sinus debridements in the office to help with your sinus healing. This appointment should be scheduled pre-operatively once the date of your surgery is confirmed. The overall goal of this post-operative care is to promote healing. Most patients tolerate the surgery and post-operative recovery very well as the surgery and healing is not particularly painful.

*A separate post-op appointment also needs to be made with your neurosurgeon’s office.*

**Avoid the Following after Surgery Until Cleared by Your Surgeons**

- **Do not engage in any strenuous activity, heavy lifting, or bending over.** As a rule of thumb, do not lift anything heavier than a gallon of milk.
- **Do not blow your nose vigorously until instructed to do so by your ENT surgeon.**
- **Do not pick, prod, or poke your nose.**
- **Do not resist the urge to sneeze or cough.** Instead, sneeze or cough with your mouth open.
- **Do not take non-steroidal anti-inflammatory (NSAIDS) medications for pain (i.e. Aspirin, Ibprofen, Advil, Motrin, Aleve, Naprosyn, etc.).** Instead, take your pain medication as prescribed or Extra Strength Tylenol (acetaminophen).
- **Do not take any supplements or herbal remedies that may increase your risk of bleeding (Vitamin E, Garlic, Ginkgo, Ginger, Sal Palmetto, etc.).**
- **Avoid alcoholic beverages.** Alcohol is dehydrating, increases your risk of bleeding, and should not be mixed with your pain medication.
- **Avoid cigarette smoking.** If you smoke, please do your best to quit or at least significantly limit your cigarette usage. Tobacco smoke is known to adversely affect post-operative healing and increase the risk of anesthesia.

*Any questions regarding your surgery, medications, complications, or post-op symptoms should be primarily directed to your neurosurgeon.*

**In the event that you experience a medical emergency or are unable to contact the office, please go to the nearest Emergency Room.**
Post-Operative ENT Visit Checklist

☐ You may need someone to drive you to and from the office. Please plan accordingly.

☐ If you are still having pain, take your prescribed pain medication or Extra Strength Tylenol (acetaminophen) 1 hour prior to your scheduled visit. The nose is most sensitive during the immediate days after surgery.

☐ Eat and drink prior to your visit.

☐ Bring a list of your medications and any questions with you.