Trans Nasal Surgery for Pituitary Tumours
Surgery

Surgery is the preferred method of treatment for most pituitary tumors. Two types of operations are done for the removal of pituitary tumors. One, called a craniotomy, is directed through the skull above the eye. The other, called a transsphenoidal operation, is directed through the nose. The craniotomy operation is rarely required

The transsphenoidal operation is the most common operation for a pituitary tumor. The surgical approach for this operation is through the nose. There is no incision on the face. This surgical approach provides the best exposure of the tumor at the lowest risk. The operation normally takes 1-1.5 hours. Following the operation, most patients return to their hospital room. Patients usually stay in the hospital for 4-5 days following the operation.

Risks of Surgery

Certain risks exist with both the craniotomy and the transsphenoidal operation. With either operation there is a small risk to life as occurs with any anesthesia and major surgery. The risk to life is much less than one percent. With either operation there is a risk to developing problems with vision because the nerves to the eyes are located in the area of the tumor. When there has been a distinct loss of vision before the operation due to pressure from the tumor, vision is often greatly improved by the operation. The degree of recovery of vision after the operation depends on how much damage has been done to the nerves of the eye by the tumor before the operation. If the degree of visual loss is minor before surgery, there may be full recovery. On the other hand, if there has been a marked loss of vision before surgery, there is often improvement in vision but not full recovery. It is possible but rare for patients who have not had a visual problem before the operation to have this type of problem afterwards.

There is some risk that surgery may damage the pituitary gland. In many cases pressure by the tumor has already damaged the gland. The chance of surgery damaging the gland is small if the tumor is small, however the risk increases when the tumor is large. In most cases, even with very large tumors, the gland regains normal function after a recovery period.

Another risk is a condition called Diabetes Insipidus which is caused by a decrease in antidiuretic hormone (ADH). A lack of this hormone leads to increased thirst and frequency of urination. The pressure from a pituitary tumor or surgery may cause this problem. Diabetes Insipidus can be treated by replacing the antidiuretic hormone with medication. This is usually given in the evening to reduce the
frequency of urination during the night. Diabetes insipidus resolves in a few days in most patients.

Other risks associated with surgical intervention include the possibility of CSF leakage from the nose requiring a secondary repair but this occurs in only 3% of operations.

Preparing for Surgery

You will be admitted to the hospital on the day before your surgery. The night before surgery, eating or drinking is not permitted after midnight. You will then be taken to the operating room where you will be moved to another bed and the anesthesiologist will put you to sleep.

Transsphenoidal Operation

Most pituitary tumors are removed by the surgical procedure called a transsphenoidal operation. Transsphenoidal means the operation is directed through the sphenoid bone and sphenoid sinus. The sphenoid is a small bone in the back of your nose located just below the pituitary gland. It often contains a large air filled cavity called the sphenoid sinus. In the past the transsphenoidal operation was begun by making a 1-2 inch incision under your lip at the top of your upper gum in the sublabial modification of the transsphenoidal approach (See Figure 3A) or within the nose in the transseptal modification. (See Figure 3B. The new procedure is called an endonasal procedure because the tumor is approached through the nasal cavity without an incision under the lip or in the front part of the nose. There is no incision on the face. The tumor is reached by working through one nostril and making a hole at the back of the nose (See Figure 3C.) into the sphenoid sinus and through the layer of bone between the sphenoid sinus and the pituitary gland. The tumor is then removed. The endonasal procedure reduces the time required in the operating room by as much as 2 hours.
A small piece of fat may be removed from the skin on your thigh to fill the cavity created by the tumor removal. (See Figure 4) This will help to prevent leakage of cerebrospinal fluid (CSF). The CSF is a fluid that surrounds the brain, spinal cord, and pituitary gland. This fluid acts as a cushion and provides nutrients for these structures.

In a small number of patients the fat packing will not hold and CSF may leak from the nose. If the drainage continues it may lead to the entrance of bacteria into the CSF. This may result in an infection called meningitis. Sometimes waiting a few days will allow this drainage to stop and no further treatment is needed. However, in a few patients (less than 3 in 100), another operation may be necessary to seal the opening at the base of the skull.

In the endonasal procedure there is no need for stitches to close the area since no incision has been made in the nose and mouth. Sometimes the nose is packed with a spongy
material to stop the bleeding for 24-48 hrs

**What to expect After Surgery**

After surgery, you will be transferred to the recovery room for several hours before being transferred to the ward.
Because the pituitary gland is at the base of the brain, an important part of your care after surgery is the frequent neurological checks by your doctors and nurses. You will be asked a series of questions that help to determine how well the brain is functioning. These checks will include some questions for you to answer (e.g. "What is your name?", "Where are you right now?", "Can you tell me the date?"). They will also shine a light in your eyes and test the strength in your arms and legs. These checks are necessary in order to detect and
monitor any changes in your condition.

**Monitoring Your Fluid Balance**

As mentioned earlier, your pituitary gland secretes a hormone called **antidiuretic hormone (ADH)** which regulates the fluid in your body. After surgery, the amount of ADH circulating in the body may decrease. The decrease in ADH will cause the kidneys to release water from the body, producing large quantities of dilute urine. Also, the large loss of water from the body may produce dehydration, and therefore, more fluids will be needed.
The deficiency of ADH is called *Diabetes Insipitus*. In most cases the deficiency resolves by the time you leave the hospital. The nursing and medical staff will be closely measuring both fluid intake and output. Therefore, it is important to keep an accurate count of every thing you drink as well as your urine output. As your recovery progresses you will need to continue to notify the nursing staff of everything you drink. During the first one or two days, an intravenous tube will remain in place until the medical and nursing staff feel you are taking enough fluid by mouth.

**Your Diet After Surgery**

The nursing staff will keep fluids at your bedside and encourage you to drink when you are thirsty. The initial diet after surgery will be clear liquids. Certain drinks which contain a lot of salt (such as Gatorade) should be avoided. Using a straw is also discouraged as this will increase the pressure in the surgical area. The nursing staff will provide you with ointment for your lips if dryness is a problem. You will progress to your regular diet when you tolerate fluids well.
Nasal Drainage

As mentioned previously under the description of the operation, a small piece of fat is removed from just under the skin over the abdomen to "plug" the opening in the back of your nose. The medical and nursing staff will also be monitoring the drainage from your nose. This is done by changing the pad covering your nose and monitoring the drainage for cerebrospinal fluid (CSF) which would indicate a leak (See Figure 5). You will also have a small dressing on your leg where the "plug" of fat was removed.

Pain After Surgery

Usually the severity of pain after surgery is relatively mild. You may experience a headache which can be
treated with medication.

**Activity**

Initially you will be on bed rest. The head of your bed must remain in an elevated position to prevent swelling to the surgical area and help you breathe easier. While you are on bedrest, you will wear a special type of stockings to improve the circulation in your legs. When you begin to get out of bed, usually the day after surgery, you will require assistance from the nursing staff until it is determined that you can walk safely by yourself.
As with any major surgery where you receive general anesthesia, it will be important to exercise your lungs to prevent complications.

**Recovering From Your Surgery**

In most patients the body will adapt to the changing levels of antidiuretic hormone (ADH) and maintain a reasonable balance of fluid. However, for a small number of patients urine production remains too high. If this occurs, your doctors may begin temporary treatment with an injection of synthetic ADH. If the body continues to be unable to control urine production, you may need to take the ADH hormone after you leave the hospital. If this occurs, you will probably be given a form of ADH which can be taken as nose drops or spray, or a tablet.

During the weeks or months after surgery repeat hormone tests are commonly needed. These tests will be similar to the ones that were done before the surgery. The endocrinologist will test how well the pituitary gland is functioning by checking hormone levels in the blood. If the levels are not high enough for everyday activities the doctor may prescribe hormone replacement therapy.

**Discharge Instructions**

During the first six or eight weeks, you should avoid using any inhalants that might irritate your nose. You may gently blow your nose after the packs have been removed. You may gradually increase your activity level over the next three weeks until you reach your previous activity level. Most patients should plan on taking approximately two or three weeks off from work, although some patients may return earlier. Swimming should be avoided for the first month.