

Types of Surgery

Epilepsy Surgery involves the brain. However, different types of operations may be done. In general they fall into two main groups:

- Removal of the area of the brain that is producing the seizures.
- Interruption of nerve pathways along which seizure impulses spread.

Lobectomy

Seizures that begin in one or more areas of the brain are known as simple or complex partial seizures. The seizures can take on different forms, depending on where they originate in the brain. The brain is divided into areas called lobes. There are temporal lobes, frontal lobes, parietal lobes and occipital lobes. There are two of each lobe, one on either side of the head. A lobectomy is an operation to remove all or part of a lobe.

This type of surgery may be performed when a person has seizures that start in the same lobe every time. It is sometimes possible to stop the seizures by removing the seizure-producing area if it can be safely done without damaging vital functions.

Risks and Benefits: For temporal lobectomies, 65 to 85% of patients will be seizure-free. Complications occur in about 4 out of every 100 of these operations. Depending on the kind of surgery that's performed, possible complications include partial losses of vision, motor ability, memory or speech. Infection or temporary swelling of the brain may also sometimes happen.

Hemispherectomy

A lobectomy removes a fairly small area of the brain. However, in rare cases a child may have severe brain disease on just one side of the brain which produces uncontrollable seizures and paralysis on the opposite side of the body. When this happens, a much more extensive operation may be considered. It is called a hemispherectomy and it removes all or almost all of one side (hemisphere) of the brain.

Risks and Benefits: It seems impossible that someone could function with only half a brain, but in children the half that is left takes over some of the functions of the part that was removed. However, there will be weakness and loss of some function on the opposite side of the body. There will also be a loss of peripheral vision. Excellent results for this operation are being reported by the small number of very specialized centers doing these operations. However, there are more risks with hemispherectomies than with other types of epilepsy surgery.

Corpus Callosotomy

Another kind of surgery for epilepsy is a corpus callosotomy (split brain surgery). The operation does not take out brain tissue; it interrupts the spread of seizures by cutting the nerve fibers connecting one side of the brain to the other. This nerve bridge is called the corpus callosum.

The seizures which respond to this type of surgery include uncontrolled generalized tonic clonic (grand mal) seizures, drop attacks, or massive jerking movements. These seizures affect both sides of the brain at once and there is usually no one area which can be removed to stop them from happening.

Seizures are usually not stopped entirely by the operation. Some type of seizure activity on one side of the brain or the other is likely to continue, but the effects are generally less severe than the repeated drop attacks or convulsions.

The operation is often done in two steps. The first operation partially separates the two halves of the brain but leaves some connections in place. If the generalized seizures stop, no further surgery is done. If they continue, the doctors may recommend a second step that completes the separation.

Risks and Benefits: Among patients having a corpus callosotomy, risks of major and minor complications after surgery are around 20 per 100 operations. Generalized seizures may stop or happen less often than before the operation. Partial seizures (that is, changes in movement, feeling or emotions without loss of consciousness) will probably continue and may even get worse. Still, the uncontrolled drop attacks and generalized tonic-clonic seizures that the operation is designed to treat have risks of their own. Decisions to operate take all these possibilities into account.

Multiple Subpial Transection

Some seizures originate in or spread to parts of the brain that are responsible for functions such as movement or language. Removing these areas would lead to paralysis or loss of language function.

A surgical technique called multiple subpial transection (MST) may be performed in these situations. It involves making small incisions in the brain which interfere with the spread of seizure impulses.

This technique may be used alone or in addition to a lobectomy.

The above information is from EFA publication "Surgery for Epilepsy". Additional information on epilepsy surgery may be found at Epilepsy Foundation of America (<http://www.epilepsyfoundation.org/>)