

# Study highlights success of brain surgery for severe epilepsy

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(Medical Xpress) -- Two-thirds of people with severe and otherwise untreatable epilepsy were completely cured of their frequent seizures after undergoing neurosurgery at the University of California, San Francisco Medical Center, according to a new study that examined 143 of these patients two years after their operations.

The new study not only shows the promise of this type of neurosurgery at treating severe [epilepsy](#), it also highlights how research into [brain](#) imaging may help to further improve results for people who have such operations.

"Surgery can be a powerful way to stop this disorder in its tracks," said UCSF Neurosurgeon Edward Chang, who led study, which is published this week in the journal *Annals of Neurology*. "Many of these people were living 10, 15 or 20 years with very severe and dangerous [seizures](#)."

The success of the surgery, added Chang, was directly related to the accuracy with which the medical team could map the brain, identify the exact pieces of tissue responsible for an individual's seizures and ultimately remove them.

"We need to continue to focus on developing new methods to figure out and pinpoint where the seizures are coming from," said Chang.

## Surgery for the Worst Cases

Epilepsy has been known as a disease since ancient times. Hippocrates, the father of western medicine, described it in detail in his writings some 2,500 years ago, and it is believed to have afflicted many famous people throughout history, including Julius Caesar. About two million people in the United States suffer from the disease today, according to the U.S. Centers for Disease Control and Prevention, and the World Health Organization estimates that some 50 million people worldwide have epilepsy, a name that means "seizures" in Greek.

While seizures are common to a number of other conditions, including head injuries, infections, exposure to toxins, sleep deprivation and stroke, people with epilepsy suffer recurrent seizures. Those seizures basically result from spontaneous instabilities in the brain's neurons that can lead to symptoms ranging from slight muscle twitches to severe convulsions and loss of consciousness, depending on which parts of the brain are involved.

For many people with epilepsy, seizures are triggered by physical malformations in their brains that formed during early development. Powerful anticonvulsant drugs help many of them overcome their seizures, but a subset of people with epilepsy do not respond to the drugs. Some suffer only the occasional seizure, but others with more severe cases of epilepsy may suffer from dozens of seizures daily.

For those with such severe, untreatable epilepsy, brain surgery can be the last and best hope, aiming to remove the problematic pieces of brain tissue - which may be as small as an acorn or as large as half the brain.

As the new study has highlighted, when the surgery works it can completely cure the seizures overnight. But a challenge remains because many malformations that cause the seizures are invisible to most forms of imaging.

UCSF Medical Center is one of just a few facilities in the country that is a world leader in brain imaging, epilepsy neurology and [neurosurgery](#), and as a result, is one of the biggest epilepsy surgery programs in the United States. The latest study was part of a larger project at UCSF that is seeking to understand the different classes of malformations in the brain that lead to seizures and why certain people respond to treatment while others do not.

While those larger questions remain unanswered, according to Chang, the latest study proves a simple concept he hopes will drive further research in the field.

The better doctors can map the brain and identify the source of the seizures, Chang said, the greater will be the impact of the surgery.

**More information:** [onlinelibrary.wiley.com/doi/10...  
2/ana.22399/abstract](https://onlinelibrary.wiley.com/doi/10.1002/ana.22399/abstract)

Provided by University of California, San Francisco

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