PERSPECTIVE

The surgical solution

Not enough doctors and patients opt for surgery to treat epilepsy, despite clinical evidence of the benefits, says **Samuel Wiebe**.

Sandra was 15 when she started having weekly seizures that altered her awareness and behaviour; she also started having generalized convulsions about once a year. Over the years, she has tried numerous antiepileptic drugs in various combinations. For eight years while she was in her twenties Sandra had no seizures but as she got older, new drug treatments have typically only controlled her seizures for a few months before her seizures returned with the same intensity.

The drugs made her drowsy and slowed her thinking, and the seizures caused injuries and embarrassment. Sandra's education was affected and, together with the fact that she could not find gainful employment, she became depressed and socially isolated. Finally, at the age of 54, Sandra was referred to a comprehensive epilepsy programme and was diagnosed with left-temporal-lobe epilepsy. She had brain surgery to remove part of that lobe. Now, three years later, she has no more seizures and is an advocate for early epilepsy surgery.

For many types of epilepsy, brain surgery has been shown to be safe and superior to anti-epileptic drugs in all published controlled studies of drug-resistant epilepsy¹. Among patients with specific types of focal epilepsy (seizures that start in one specific area of the brain, as opposed to multiple or bilateral brain regions), about 65% of surgically treated patients stopped having seizures, compared with 8% of those treated with antiepileptic drugs alone². For every two patients given surgery, one will become seizure free. The same ratio applies for surgery performed early in the disease³, and for the number of patients achieving clinically important improvements in quality of life⁴. By comparison, carotid surgery to prevent stroke is considered to be hugely effective but needs to treat eight to ten patients for one to benefit. Epilepsy surgery helps to prevent death from accidents, seizure-related events, suicide and sudden unexpected death in epilepsy, and also extends a patient's years of healthy life.

Evidence-based clinical practice guidelines stipulate that patients with focal epilepsy should be referred for surgical evaluation straight away, but this generally happens only after two or three decades, or not at all. Moreover, the rate of epilepsy surgery remained unchanged despite the publication in 2001 of a randomized controlled trial demonstrating the benefits of surgery⁵, and the 2003 publication of evidence-based guidelines that encourage surgery⁶.

WHY NOT SURGERY?

So why is this highly effective, potentially life-changing treatment used so infrequently? The clinical condition of drug-resistant epilepsy often follows a complex course marked by periods of remission, as in Sandra's case, complicating the decision to opt for surgery. Another factor is the hope that a new drug or combination of drugs will be able to control seizures.

In addition, brain surgery is a major intervention. Surgically removing part of the brain — the seat of our intelligence, emotions and sense of self — is a sobering prospect and demands meticulous evaluation

of risks and benefits. Physicians need to explain to patients that in centres with experienced surgeons using modern imaging and surgical techniques, epilepsy surgery has a low complication rate of only 3–5%, and almost no mortality. Epilepsy surgery is safe.

The knowledge and attitudes of patients play a major role in the decision to explore epilepsy surgery, and some people with epilepsy come up with many reasons to avoid it. Race and socioeconomic standing also affect the decision. In the United States, for example, African-Americans, Hispanic adults and other ethnic groups or those without private insurance are less likely to consider epilepsy surgery.

The knowledge and attitudes of clinicians are equally important. International surveys show that neurologists may lack sufficient knowledge about the benefits and safety of epilepsy surgery. As well as conveying clearly and convincingly the benefits and safety of epilepsy surgery, clinicians need to be aware of the value of being completely

free of seizures, and of the serious and life-threatening consequences of poorly controlled seizures. Health-care experts also need to understand that patients have a very low probability of controlling their seizures with additional medications if they fail with two appropriately chosen and adequately used antiepileptic drugs — the definition of drug-resistant epilepsy. A group of colleagues and I have created a user-friendly Internet-based tool to help clinicians identify patients who should be referred for surgical evaluation⁷.

Finally, the health-care system plays a central role in providing access to specialized epilepsy centres during pre-surgical evaluation, surgery and post-operative care. Clinicians often point to limited access to these resources as one of the main barriers to epilepsy surgery. But patients

need a patient-centred, well-informed clinical environment that addresses their individual concerns as they navigate the decision-making process. Neurologists and the health-care system must create that environment.

My colleagues and I need to do a better job of informing health care policy-makers and resource allocators about the high socioeconomic burden of uncontrolled epilepsy. Everyone working in health care needs to help spread awareness that epilepsy surgery is safe and cost-effective. Epilepsy patients around the world stand to gain great benefits if we succeed. ■

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- Schmidt, D. & Stavem, K. *Epilepsia* **50**, 1301–1309 (2009).
- Engel, J. et al. *J. Am. Med. Assoc.* **307**, 922–930 (2012).
- Wiebe, S. & Jette, N. *Nature Rev. Neurol.* **8**, 669–677 (2012).
- Fiest, K. M., Sajobi, T. T. & Wiebe, S. *Epilepsia* <http://dx.doi.org/10.1111/epi.12625> (2014).
- Wiebe, S. et al. *N. Engl. J. Med.* **345**, 311–318 (2001).
- Engel, J. Jr et al. *Neurology* **60**, 538–547 (2003).
- Jette, N. et al. *Neurology* **79**, 1084–1093 (2012).