The need for developing comprehensive epilepsy surgery units in India

It gives us immense pleasure to finally see the birth of this journal, which would cater exclusively to the neurosurgical community of India.

This journal took shape as a result of a natural need required for an academic and research platform for the work done by the neurosurgical community of India. India currently has about 2000 neurosurgeons. Apart from the academic curriculum from the major institutes, there are a number of smaller hospitals which cater to diploma courses in neurosurgery. It is expected that by 2020, the neurosurgical community would cross about 7000, bringing it to an equivalent platform as many other medical specialties.

At the outset, we are very grateful to the large consortium of international and national faculties who have agreed to be on the editorial board. However, it does leave me with a sense of trepidation on what I should write in the inaugural issue of IJNS. After some thought, I thought I would write on the need to develop epilepsy surgery units across this country, which indeed is a major shortcoming. Having worked on this sub-specialty now for over 14 years and with an experience of over 600 cases of surgeries for intractable epilepsy, I feel that this sub-specialty still does not optimally exist even in some major centers of our country.

Perhaps no other disease has been associated with so much of stigma as epilepsy in modern days. Also, no other disease has been more misunderstood.

Epilepsy affects 50 million people worldwide and 80% of them live in the developing world.[1] Some individuals continue to have frequent seizures despite optimal treatment with anti-epileptic drugs (AEDs). However, more than 70% of patients who are treated achieve long-term remission or freedom from seizures, usually within 5 years of diagnosis.[2] The rest 30% may become refractory to AEDs and other forms of medical treatment, hence become suitable candidates to be investigated for the possibility of epilepsy surgery. While large-scale epidemiological studies in India are still not available,[3-5] an extrapolation of data suggests that our country would have about 1 million people suffering from epilepsy and would have at any given point of time 200,000 patients who would benefit from surgery (about 20,000 new surgical candidates being added every year). This obviously places an immense responsibility on the neurosurgeons from India to develop comprehensive facilities which would cater to epilepsy surgery.

Currently, developing countries like India witness an immense treatment gap for epilepsy surgery due to various reasons:

1. *Lack of facilities for epilepsy surgery in most of the neurosurgical centers*: Comprehensive epilepsy surgery program is available only in a few centers, even though sporadic surgery for pathologies like mesial temporal sclerosis may be performed in many hospitals.
2. *Lack of awareness among general physicians and even neurologists*:
   a. While most of the neurologists are now aware about the benefits of epilepsy surgery, still many physicians are reluctant to refer cases until the full spectrum of AEDs (about 18–20 at the present time) is exhausted. The landmark study by Kwan and Brodie has clearly demonstrated that drug refractoriness may be easily identified quite early in the course of the disease.[6,7] Hence, if the patient demonstrates "breakthrough" seizures with two or a maximum of three drugs provided in an optimum combination for a duration of around 2 years, it is likely that the patient will not respond to any further new AED added.
   b. Many physicians still believe that epilepsy surgery is a treatment of last resort. This is not true. If epilepsy surgery is provided early in the course of the disease, seizure freedom may lead to a better cognitive outcome, better quality of life, and an earlier return to normal activities of daily living. In fact, even though technically a portion of "brain" is resected during surgery, the patient experiences enormous improvement in his cognitive, psychosocial, and physiological

Access this article online	
Quick Response Code:	Website: www.ijns.in
	DOI: 10.4103/2277-9167.94361

This document was downloaded for personal use only. Unauthorized distribution is strictly prohibited.

well-being due to the fact that once the "abnormal epileptogenic circuit" is excised, the rest of the brain undergoes a "rejuvenation" due to plasticity.[8,9]

3. *Stigma*: Last, but not the least, this is one of the major factors responsible for the large treatment gap in epilepsy surgery due to its associations with superstitions, lack of awareness, etc.

Obviously, developing epilepsy surgery units will not be an easy task as this would require (a) a team effort with neurologists having specific interest in epilepsy, (b) surgeons who have had sufficient training to handle this sub-specialty, and (c) supporting departments like neuropsychology, nuclear medicine, etc.

In our earlier publication,[10] we had suggested a tiered paradigm structure to develop this sub-specialty.

Level I center: This is the most basic level. Surgeries capable at this level would be pathologies like mesial temporal sclerosis and lesions with good concordance. Investigative modalities like magnetic resonance imaging (MRI; at least 1.5 T, and expertise to perform epilepsy protocol MRI), video EEG and interictal EEG would be sufficient for this level of center.

Level II center: This is a more advanced center. Here, all epilepsy surgeries should be capable of being performed except phase II surgeries (invasive EEG recordings). Investigative modalities that need to be available would include single-photon emission tomography (SPECT) in addition to the investigations present in Level I center.

Level III center: This is the most advanced center and should have all investigative modalities including positron emission tomography (PET) and magnetoencephalography (MEG). In addition, this center should also have capability of performing significant research in this area and should act as a nodal center for training and coordinating with other centers.

One has to understand that the surgery for intractable epilepsy requires a team approach. Unlike brain tumor, where the lesion corresponds to the pathology, the same is not true for epilepsy surgery. The "epileptogenic zone" is actually a network of abnormal neurons, which may or may not correspond to the anatomical substrate seen on MRI. Hence, concordances of multiple investigations that involve anatomical (MRI), functional (SPECT, PET, MEG) and electrical (Video EEG, MEG) pathways are necessary to localize this zone.

HOW MUCH TRAINING IS NECESSARY?

Optimal training for epilepsy surgery has been debated in many forums,[11,12] including the San Servolo summer school for epilepsy[11] (ILAE), where a project on this topic was developed. Optimal period of training for a fully qualified neurosurgeon is desirable for 1 year. However, a longer duration of training is not possible for most Indian neurosurgeons due to problems associated with leave, availability of surgeries at the training centers, etc. In such situations, a 6-month intensive training may also be considered. It is often advantageous providing more specific pathology-driven training for senior level neurosurgeons. For example, it may be considerably easier to train a neurosurgeon on how to perform temporal lobectomy (with amygdalo-hippocampectomy) for mesial temporal sclerosis, as he/she would already have had performed this surgery for other pathologies like tumor, etc. During the training, only some specific things become necessary to be learnt, for example, how much of hippocampus to resect, how to avoid perforator injury, etc. In countries like India, such pathology-specific short-term training may become important as it would still help to lower the patient burden in many centers rather than referring them to larger centers. Comprehensive fellowship programs are now available in India. At AIIMS, a 1-year fellowship program for epilepsy surgery will be soon started (with funding from Department of Biotechnology), which will also include a 2-month laboratory training on research paradigms for epilepsy. Finally, one must remember that epilepsy surgery is very different from other sub-specialties in the following: (a) requires an intensive team approach; (b) localization of epileptogenic focus is often not easy and requires multiple investigations and combined meetings; and (c) finally, the aim of surgery is not the patient waking up "without deficits" but remaining seizure free. This becomes considerably challenging 1 year down the line. This is where the role of experience and expertise comes in.

P. Sarat Chandra

Department of Neurosurgery, Room 7, 6th floor, CN Center,
All India Institute of Medical Sciences (AIIMS), New Delhi, India
E-mail: saratpchandra3@gmail.com

REFERENCES

1. Leonardi M, Ustun T. The global burden of epilepsy. Epilepsia 2002;43:21-5.
2. de Boer HM, Mula M, Sander JW. The global burden and stigma of epilepsy. Epilepsy Behav 2008;12:540-6.
3. Bharucha NE. Epidemiology of epilepsy in India. Epilepsia 2003;44 Suppl 1:9-11.
4. Radhakrishnan K. Challenges in the management of epilepsy in resource-poor countries. Nat Rev Neurol 2009;5:323-30.
5. Tripathi M, Padhy UP, Vibha D, Bhatia R, Padma Srivastava MV, Singh MB, *et al*. Predictors of refractory epilepsy in north India: A case-control study. Seizure 2011;20:779-83.

This document was downloaded for personal use only. Unauthorized distribution is strictly prohibited.

6. Kwan P, Brodie MJ. Early identification of refractory epilepsy. N Engl J Med 2000;342:314-9.
7. Kwan P, Brodie MJ. Epilepsy after the first drug fails: Substitution or add-on. Seizure 2000;9:464-8.
8. Ahmad FU, Tripathi M, Padma MV, Gaikwad S, Gupta A, Bal CS, *et al*. Health-related quality of life using QOLIE-31: Before and after epilepsy surgery a prospective study at a tertiary care center. Neurol India 2007;55:343-8.
9. Sanyal SK, Chandra PS, Gupta S, Tripathi M, Singh VP, Jain S, *et al*. Memory and intelligence outcome following surgery for intractable temporal lobe epilepsy: Relationship to seizure outcome and evaluation using a customized neuropsychological battery. Epilepsy Behav 2005;6:147-55.
10. Chandra PS, Tripathi M. Epilepsy surgery: Recommendations for India. Ann Indian AcadNeurol 2010;13:87-93.
11. Avanzini G. Special issue on San Servolo Epilepsy Courses Alumni Meeting. Editorial. Epilepsy Res 2010;89:1.
12. Rao MB, Radhakrishnan K. Is epilepsy surgery possible in countries with limited resources? Epilepsia 2000;41;Suppl 4: S31-4.

How to cite this article: Chandra PS. The need for developing comprehensive epilepsy surgery units in India. Indian J Neurosurg 2012;1:1-3.

This document was downloaded for personal use only. Unauthorized distribution is strictly prohibited.

Announcement

Android App

A free application to browse and search the journal's content is now available for Android based mobiles and devices.. The application provides "Table of Contents" of the latest issues, which are stored on the device for future offline browsing. Internet connection is required to access the back issues and search facility. The application is compatible with all the versions of Android. The application can be downloaded from https://market.android.com/details?id=comm.app.medknow. For suggestions and comments do write back to us.