

# Current status of epilepsy surgery in Nepal

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## Abstract

Epilepsy surgery could not be started in Nepal till recently because we lacked know-how on epileptic zone localization. With the guidance of Prof. K Arita and Prof. T Hori we could start this surgery from 2002. Now we are performing surgery on our own but still have limitation in regards to case selection. At present Kathmandu Model Hospital is the only institute providing surgery for non-lesional cases. We have operated on 11 cases of non-lesional epilepsy of which 9 were temporal lobe epilepsy and 2 were drop attacks. Engel class I result could be achieved in 7 and class II in 2 cases. Both of the drop attack cases underwent complete corpus callosotomy and had no further atonic seizure. One patient had transient hemiparesis and there was no mortality or permanent morbidity. Achieving good result especially in the initial phase is important to convince the medical community to accept this treatment modality. Initial failure will lead to lack of enthusiasm, referral and even restriction on the program. In this regards we have been able to prepare groundwork for future development of epilepsy surgery. Epilepsy surgery can be an acceptable and cost-effective method of treatment for intractable seizure in countries having similar socio-economic scenario.

## INTRODUCTION

The prevalence of epilepsy differs from different nations and its etiology also varies accordingly. The distribution of this disease among different age group also shows striking difference among different nations. Neurocysticercosis is the single most common cause of seizure in Nepal.<sup>1</sup> Unlike report from Latin countries the prevalence of neurocysticercosis is most commonly among the young age group. Most of the neurocysticercosis seen in Nepal is a solitary lesion with a self limiting life span, seizure in these group is also self limiting, however occasionally the cyst leaves behind scarring which becomes a potential epileptogenic foci and a possible candidates for surgery.<sup>2</sup> Different reports have already shown that in certain types of epilepsy, surgery could be best option rather than a prolonged unsuccessful antiepileptic medication.<sup>3-5</sup> Although aware of this fact, epilepsy surgery could not be started in our center until recently, mainly because there is lack of know-how on epileptic zone localization. With the guidance from experienced surgeons like Prof. K Arita and Prof. T Hori we could start this surgery from 2002. Since then we have been doing case discussion by sending MR images, EEG or video recording through internet to determine surgical indication. With increasing experience we could do this surgery on our own but still have limitation in regards to case selection. We are

following many potential candidates of surgery but hesitate to operate on some of them because of inability to determine the epileptic zone. At present Kathmandu Model Hospital is the only institute in the country providing surgery for non-lesional epilepsy in a routine basis together with other functional surgery.<sup>6</sup> Epilepsy surgery for lesional cases are being performed in other three major neurosurgical centers in the country. One of the limiting factor in the development of this specialty is the inability of a center to fully dedicate on epilepsy surgery alone in the face of other pressing need for life saving surgery. Out of the 323 surgeries done in this institute in 2005, only 23 presented with seizure. This is a report of our experience to date.

## METHODS

We have been maintaining electronic data base for all the intractable seizure cases, following them closely as possible candidates for surgery. Only those who had clear evidence of intractability despite an adequate trial of multiple drug regimes were subjected for surgical evaluation. A detailed history were taken giving emphasis to witness account on seizure semiology, since we feel this is the single most cost-effective method for screening of surgical candidate among the large pool of epilepsy patients. At times family members were asked to record by video the seizures

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at home. Also multiple sleep deprived scalp electroencephalography (EEG) were obtained at this stage in all cases. When the seizure semiology suggested seizure arising from temporal lobe<sup>7</sup> MR imaging is obtained. Surgery is offered only if the semiology, scalp EEG, and MR imaging all three suggested the lesion on the same side. Those cases where we could not decide on the indication for surgery were sent via internet to experts in other countries for further opinion. In one patient, video-EEG and SPECT was also done. Only one patient who had left sided lesion underwent Wada test.<sup>8</sup> Of the anterior temporal lobectomy performed, 4 patients had classical temporal lobectomy, 3 had tailored lobectomy, and 2 had selective amygdalohippocampectomy. There were two patients with drop attack, both having frequent atonic seizures leading to multiple facial injuries. Rather than staged surgery, we did total corpus callosotomy in both the patients. Despite the presence of few candidates with cortical scarring following NCC, we could not do a selective lesionectomy or multiple subpial transection because of lack of experience in intraoperative electrocorticography (EcoG).

## RESULTS

From January 2002 to August 2005, we performed 9 cases of anterior temporal lobectomy in Kathmandu Model Hospital. The age ranged from 11 to 33 years. History of seizure was from 9-27 years, and all the patients were on multiple antiepileptic drug regimes ranging from 2-5 drugs. Out of the 9 patients of anterior temporal lobectomy, 7 had no seizure or only occasional aura following surgery (Engel classification I), one patient had one episode of seizure in cluster following surgery, and another patient has one

seizure in a year (Engel classification II). One patient with classical temporal lobectomy had transient hemiparesis, which recovered completely within 1 month of surgery. There was no other complication seen. None of the patient complained of visual field defect, although postoperative visual field study was not performed. Among the two patients with drop attacks who underwent corpus callosotomy, both did not have any atonic seizure after the surgery. However one patient who also had focal seizures continued to have rare focal seizures after the operation. Disconnection syndrome was not seen in both the patients. However, transient decrease in speech was observed in one patient. All of the patients operated in this series were leading an active life after the surgery. We continued the antiepileptic drugs for at least 2 years following surgery and then gradually tapered off the medication. In patients who experienced frequent aura, antiepileptic medication was continued even when there were no other seizure manifestations. (Table 1, Figures 1-3).

## DISCUSSION

Epilepsy surgery is still in an infancy stage in Nepal. Only limited institutions are ready to evaluate drug resistant patients who do not have a lesion on neuroimaging. Intraoperative EcoG service is still not available in this country. There is also limitation on deciding the lateralization of the seizures by scalp EEG alone. As such, we only offered surgery to patients whose semiology, scalp EEG and MRI imaging all showing the same epileptogenic zone. The results of our patients are similar to those reported from elsewhere. This shows that even with a simple setup and limited equipment good surgical results can be achieved.

**Table 1. Summary of results of non-lesional epilepsy surgery**

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Total no of patients: 11

Age range: 11-33 yrs

Seizure history: 9-27 years

Anterior temporal lobectomy: 9 patients

Corpus callosotomy: 2 patients

Follow up duration: 10 months to 3 years.

Anterior temporal lobectomy: Engel class I (8 patients),

Engel class II (1 patient with one seizure 3 months after surgery)

Corpus callosotomy: Focal seizure in 1 patient who was operated for drop attack

Complications:

Hemiparesis (Transient in 1 patient following anterior temporal lobectomy)

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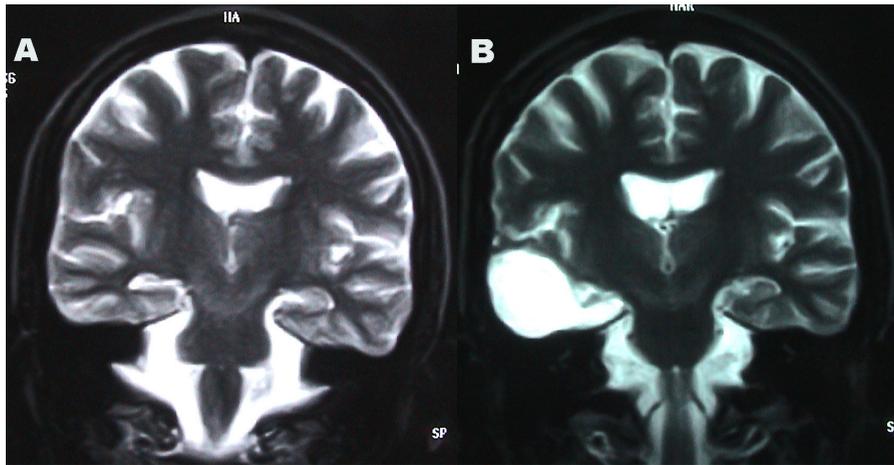


Figure 1. Right sided classical anterior temporal lobectomy. A: Preoperative MRI, T2WI coronal section showing right hippocampal sclerosis, B: Postoperative image.

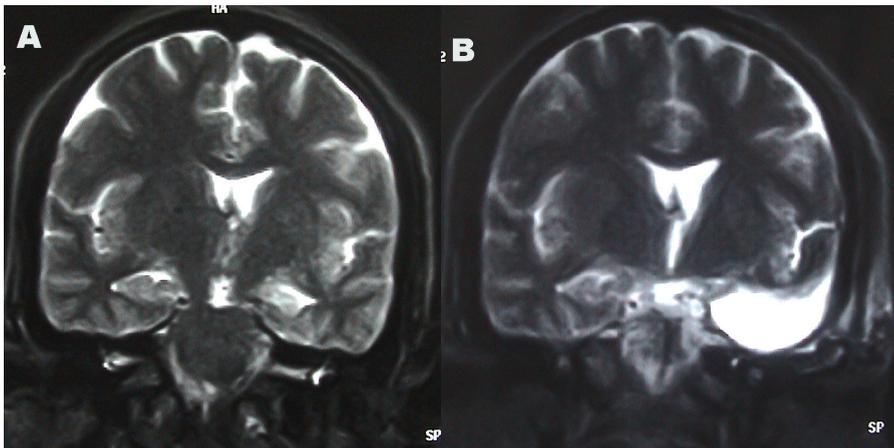


Figure 2. Left sided tailored anterior temporal lobectomy. A: Preoperative MRI, T2WI showing left hippocampal sclerosis, B: Postoperative MRI, T2WI showing the extent of surgical resection, with superior temporal gyrus preservation.

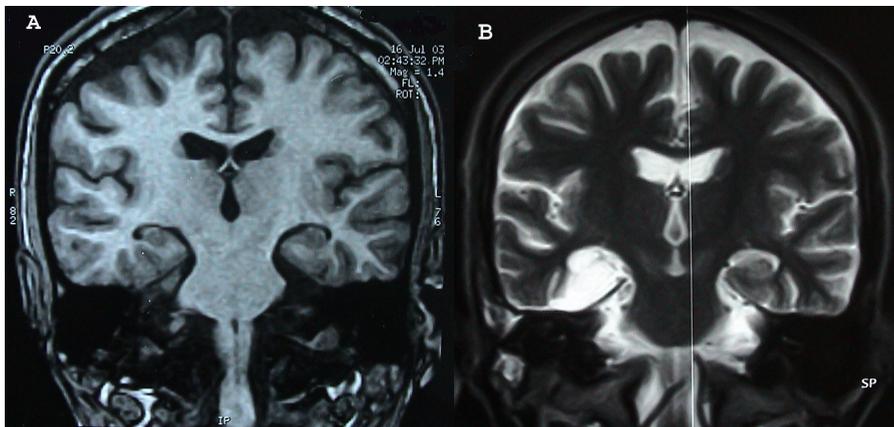


Figure 3. Selective amygdalohippocampectomy. A: Preoperative MRI, T1WI coronal section showing right hippocampal sclerosis, B: postoperative image showing extent of surgical removal where lateral temporal structures are not removed. (Reprint permission from *Nepal Journal of Neurosciences*)

We have recently acquired the knowledge for intraoperative EcoG, and also awake anesthesia with cortical mapping.<sup>9</sup> This may result in some modifications in our future service. Functional MR imaging and magneto-encephalography<sup>11</sup> also help in localization of the epileptic zone and its relation with eloquent area, but these tests are presently not available in this country.

Although the outcome of different types of anterior temporal lobectomy is similar, the limitation of perioperative localization of epileptic zone limits us from performing a more selective procedure such as selective amygdalohippocampectomy.<sup>11-14</sup> Although newer surgical and radiotherapeutic techniques for treating epilepsy is emerging, we feel that use of such technique is determined by socio-economic factor of a given community<sup>15,16</sup> and these techniques also have its limitations in seizure control.<sup>17,18</sup> We usually give antiepileptic drug for at least two years following surgery before tapering.<sup>19</sup> As epilepsy surgery is still a part of general neurosurgery, its future progress may be facilitated if the service can be developed separately.

About a quarter of epilepsy patients are intractable to medical treatment, and many are potential candidates for surgery. Since the medical community becomes more aware of our results, they have come to realize the potentials of surgical management of epilepsy. However to be able to offer surgical care to more patients, more educational activities should be provided to general physicians, psychiatrists, pediatricians and general practitioners, who manage the majority of epilepsy patients in this country. Some medical centers are providing epilepsy care to the patients outside the capital city in the form of health camps. In such camps we work with the local doctors to diagnose, classify, and decide on the best antiepileptic medications for the epilepsy patient. The patients are followed up by the local doctors after the camps. We have also identified suitable surgical candidates during these camps. Nevertheless, it will be many more years before we can educate the medical community at large on its benefit. Globally there is big gap in management of epilepsy between within different countries and within the same country.<sup>20</sup> The other barrier to bridging the surgical treatment gap in this country is the patient's access to medical facilities at large. Socio-economic factor is the other major determinant on how epilepsy surgery service will develop further in Nepal.

In conclusion, since some antiepileptic drugs

are expensive and timely follow up is difficult, surgery is an option in developing countries for medically intractable epilepsy patients. Our results show that epilepsy surgery is possible even in a setup with limited facilities. Good surgical results should help to popularize epilepsy surgery to the wider medical community. Because of the lack of proper diagnostic facilities, a precise localization of epileptic zone may not be always possible. Thus, classical anterior temporal lobectomy may be the preferred technique until better localization is possible. Because of high prevalence of neurocysticercosis in Nepal, there is potential of performing other cortical disconnection procedures. For a country that is beginning epilepsy surgery, guidance from centers with more experience is desirable.

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