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Development of epilepsy surgery in children in Thailand: Experiences in Ramathibodi Hospital

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Abstract

The authors report the experience in treatment of pediatric epilepsy in a referral university hospital located in Bangkok, Thailand. After the reactivation of program of surgical treatment for epilepsy in the Institute in October 2005, seven Thai children under 17 years with intractable epilepsy received surgical treatment. Presurgical evaluation for each patient includes 1.5-tesla magnetic resonance imaging of brain, interictal and ictal EEG recording with video monitoring, and ictal and interictal SPECT. Evaluation of memory is applied to selected case. The surgical treatment includes corpus callosotomy in one patient; cortical resection, anterior temporal lobectomy with amygdalohippocampectomy, and function hemispherectomy in 2 patients each. Pathological findings were glioneural harmatoma, mesial temporal sclerosis, combination of mesial temporal sclerosis and neuronal heterotropia, dysembryoplastic neuroepithelial tumor (DNET), and ganglioglioma. There was no immediate complication or aggravation of seizures observed. Being a preliminary report in small number of patients, conclusion of outcome of treatment is not possible. However, this report represents the effort of the authors in setting up a comprehensive epilepsy program to offer surgical treatment of epilepsy in children in Thailand. The preliminary result is favorable and creates the motivation in rendering the treatment option for children with intractable epilepsy in the country.

INTRODUCTION

Surgical treatment for epilepsy in Thailand is still in the developing process. In the past, most of the epilepsy surgery focused on patients with pathological lesions such as vascular malformation, cerebral tumor, and abscess. Hemispherectomy and amygdalectomy were performed in few cases. Owing to the limitation of human resources, technical know-how and financial supports; surgical treatment for children with epilepsy in Thailand has slowly developed. since 1992. Initially, the surgical treatment was established in 2 university-based hospitals at Ramathibodi Hospital of the Mahidol University and King Chulalongkorn Memorial Hospital of the Chulalongkorn University.[1,2] The third group was set up at Phramongutklao Hospital of the Royal Thai Army.[3,4] At present, the most well-established epilepsy center is located at King Chulalongkorn Memorial Hospital, which is known as The Chulalongkorn Comprehensive Epilepsy Program, where more than 100 patients received surgical treatment for epilepsy with favourable outcomes.[2,5,6]

Ramathibodi Hospital, a university hospital located in Bangkok, Thailand, is a busy referral center for children with neurological problems including epilepsy. Under the condition of limited resources, the first series of 14 children with intractable temporal lobe epilepsy received surgical treatment from 1993 to 1998 was reported.[2] Temporal lobectomy with

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amygdalohippocampectomy was the main surgical procedure. Cessation or reduction of seizures was achieved in 70% of these patients. However, owing to the lack of manpower, limitation of mandatory investigations and insufficient equipment for comprehensive presurgical evaluation for patients with epilepsy; surgical treatment in children in the Institute was temporarily withheld in 1999. However, the preparation of necessary equipment and manpower has been planned and is in progress. In October 2005, Ramathibodi Epilepsy Surgery Group, consisting of pediatric neurologists, neurosurgeons, neuroradiologists, neuropathologists and a psychiatrist, was set up to activate the surgical treatment for intractable epilepsy in children. Since then till February 28, 2006, seven children with intractable epilepsy have received surgical treatment for epilepsy in the Institute. The preliminary result of the treatment is reported herein.

METHODS

After history review and clinical evaluations, the patients with epilepsy who had intractable seizure and with potential candidates for surgical treatment were recruited. Presurgical evaluation for each patient includes 1.5-tesla MR imaging of brain, interictal and ictal EEG recording with video monitoring, and ictal and interictal single photon emission computerized tomography (SPECT). Evaluation of memory is applied only to patients to whom the evaluation was applicable. Intraoperative electrocorticography (ECoG) was performed in patients who had clinical indication.

RESULTS

During the 5-month period, there were 2 boys and 5 girls with the range of ages from 2 years to 17 years (mean 10.3 year, median 11 years) received surgical treatment. Table 1 lists the demographic data and the classification of seizure and epilepsy of each patient. All of these patients had intractable seizures. The mean duration from the age of onset of seizure to the age of surgical treatment was 63 months (range 23 to 180 months). There were 5 patients who were taking three antiepileptic drugs at the time of evaluation for surgery.

The detail of surgical treatment is shown in Table 2. Pathological findings, which were applicable in 5 patients, disclosed glioneural harmatoma, mesial temporal sclerosis, combination of mesial temporal sclerosis and neuronal heterotropia, dysembryoplastic neuroepithelial tumor (DNET), and ganglioglioma respectively (Table 2).

Duration of the follow-up evaluation ranges from one to four months. The result of the clinical outcomes is shown in Table 3.

Table 1: Demographic data and characteristics of epilepsy of the patients

Patients	Gender	Age at treatment (years)	Age at onset	Type of seizure	Etiology of epilepsy	Epilepsy syndrome
1	F	10	5 years	SPS	Symptomatic	NA
2	F	11	1 year	CPS	Symptomatic	TLE
3	M	11	6 years 9 months	CPS with 2 GTC	Symptomatic	TLE
4	F	17	10 years	CPS	Cryptogenic	NA
5	M	2	6 months	EPC	Cryptogenic	NA
6	F	4	1 year 2 months	Mixed types	Cryptogenic	LGS
7	F	17	3 years	EPC	Cryptogenic	NA

SPS: Simple partial seizure, CPS: Complex partial seizure, GTC: Generalized tonic-clonic seizure, EPC: Epilepsia partialis continua, TLE: Temporal lobe epilepsy, LGS: Lennox-Gastuat syndrome, NA: Not applicable

Table 2: Types of surgical treatment

Patients	Surgical procedures	Pathological findings
1	Cortical resection	DNET
2	ATL-AH	Ganglioglioma
3	Cortical resection	Subcortical glioneuronal harmatoma
4	ATL-AH	MTS
5	Functional hemispherectomy	MTS with neuronal heterotropia
6	Corpus callosotomy + lobectomy	NA
7	Functional hemispherectomy + resection of insular cortex	NA

ATL-AH: Anterior temporal lobectomy and amygdalohippocampectomy, MTS: Mesial temporal sclerosis, DNET: Dysembryoplastic neuroepithelial tumor, NA: Not applicable

DISCUSSION

Surgical treatment for epilepsy has been shown to be a beneficial method for treatment of intractable epilepsy.[7,8] It is an early treatment option for children and adults with temporal lobe epilepsy who failed to respond to treatment with appropriate antiepileptic drugs.[7] It is also indicated for those with extratemporal lobe epilepsies especially in those with structural lesion. For those with cryptogenic epilepsy, careful selection of certain patients is necessary to obtain the favorable and optimum outcomes. However, patient selection needs comprehensive evaluations, which are still not available in some developing countries.

In Thailand, there is no data regarding the prevalence of epilepsy. However, the magnitude of this illness is thought to be no difference from that reported in Western countries.[9] Owing to the limitation of financial and human resources, development of epilepsy surgery is relatively slow in comparison to some countries in Asia such as Japan, Taiwan and Korea. Nevertheless, for the past 15 years, there have been attempts to establish a comprehensive treatment for Thai people with epilepsy.[1] The well-established center with successful result is the Chulalongkorn Comprehensive Epilepsy Program. Improvement of the quality of life of the Thai patients with

Table 3: Result of surgical treatment

Patients	Seizure reduction	Clinical observation
1	No seizure	No change in mental function
2	No seizure	No change in mental function
3	No seizure	Alert, interactive, improvement of speech
4	Few seizures (> 90 % reduction)	Brief post-operative psychosis
5	No seizure	Alert, interactive
6	No seizure	Alert, more interactive
7	Few seizures (> 90 % reduction)	No change in mental function

epilepsy was also been documented.[6] However, the numbers of patients who are in need of epilepsy surgery is still far beyond the available services in the country.

This report demonstrates the willingness of our group to contribute in the improving the quality of care for children with intractable epilepsy. Previously we reported our experience in surgical treatment in a small group of children with temporal lobe epilepsy.[1] In this current report, there were various methods of surgical treatment for various underlying causes. The favorable immediate post surgical treatment was observed in one child with Lennox-Gastuat syndrome who received corpus callosotomy and occipital lobectomy. Cessation of seizure with improvement of social interaction was also obtained in another child with tuberous sclerosis who received cortical resection of subcortical glioneuronal harmatoma. This observation is inline with the previous suggestion in selection of certain epilepsy syndromes such as Lennox-Gastuat syndrome, tuberous sclerosis complex and epilepsia partialis continua for surgical treatment.[10]

It is premature currently to conclude the outcome of our treatment. Owing to the significant reduction of seizures and cessation of seizures obtained in 2 and 5 patients respectively along with the improvement of behavioral problems in 2 patients, this preliminary result provides confidence to our group in rendering surgical treatment to children with intractable epilepsy in our Institute. A plan to recruit pediatric patients for evaluation of surgery is currently in process. We hope that our group will be able to contribute to an optimum treatment of epilepsy in children in Thailand.

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