

# Epilepsy surgery service in Malaysia

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## Abstract

Malaysia is a middle income country of 25.3 million population. The adult epilepsy surgery service commenced in 1996 at Hospital UKM, Kuala Lumpur, followed by paediatric surgery service in 2001, from the same centre. Medial temporal sclerosis accounts for about 80% of the adult surgery. The overall seizure free rate for hippocampal sclerosis is 65% at 4.3 years. Low number of Epileptologists, and lack of specialist neurology services outside the capital can be identified as reasons for low case load for surgery.

## MALAYSIA – DEMOGRAPHICS, HEALTH CARE INDICATORS

Malaysia is a middle income country with a population of 25.3 million. The Adult Literacy Rate is 87.1%, the Human Development Index 0.79, the per Capita GDP is USD 8,750. The health expenditure comprises 1.8 % of GDP.<sup>1,2</sup> The doctor-population ratio is 1:1,406; life expectancy at birth (2000-2005) 73.1 years; the infant mortality rate (2001) 8%.<sup>3</sup> The organization of the hospital care system and staffing by Neurologists and Neurosurgeons is shown in Table 1.

## CURRENT STATUS OF EPILEPSY SURGERY SERVICES

The adult epilepsy surgery service in Malaysia commenced in 1996, at Hospital UKM, Kuala Lumpur. Since 2001, a paediatric epilepsy surgery service was also provided at the same centre.

Staff providing for presurgical evaluation and epilepsy surgery includes 2 Neurosurgeons, 2 adult Neurologists, 2 Paediatric Neurologists and several EEG technicians. Services of a Neuroradiologist, a Psychologist and Psychiatrist

are available when required. Presurgical evaluation comprised of interictal EEG, video EEG monitoring, MRI (with a 1.5 T magnet) and neuropsychological evaluation. Facilities for invasive EEG monitoring, SPECT and PET scanning facilities are not available. Neurosurgical equipment includes a Zeiss NC 31 microscope, ultrasonic aspirator and an image guidance system (Brain Lab).

Techniques not utilized so far include invasive EEG monitoring, sophisticated MRI techniques (such as f-MRI), SPECT, and PET. The WADA test has not been utilized.

Till present, a total of 105 Epilepsy Surgery procedures have been performed in adults and children at Hospital UKM. These included medial temporal resection, selective amygalohippocampal resection, focal cortical resection, functional hemispherotomy and corpus callosotomy (Table 2). There was no operative mortality in the series. The overall seizure free rate for hippocampal sclerosis (68 patients) is 65% at 4.3 years, with 15% having infrequent seizures. For focal resections the seizure free rate was 55% at 3.0 years. Both patients who had

**Table 1. Organization of the hospital care system in Malaysia**

Institution	Tertiary referral hospitals (5) (Level I)	Provincial tertiary care hospitals (12) (Level II)	District hospitals (90) (Level III)
Catchment population	1-2 million	Approximate 100,000	Approximate 50,000
Availability of Neurosurgeons, Neurologists	All hospitals	Some hospitals	None

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**Table 2 (a) Experience with adult epilepsy surgery 1996-2005 (Total 81 patients)**

Lesion Type	Seizure outcome	Major complications
Medial temporal sclerosis (67 patients)	Seizure free (65%, mean follow up 4.3 years)	Hemiparesis (1 patient) Disabling hemianopia (4 patients) Significant verbal memory impairment (5 patients)
Medial temporal tumors (7 patients)	Seizure free (5 patients)	none
Neocortical lesions (7 patients)	Seizure free (4 patients)	none

**(b) Experience with paediatric epilepsy surgery 2001-2005 (Total 24 children)**

Lesion type	Seizure outcome	Major complications
Medial temporal sclerosis (4 children)	Seizure free (3 children)	None
Medial temporal tumors (7 children)	Seizure free (5 children)	None
Neocortical lesions (5 children)	Seizure free (3 children)	Mild arm weakness (1 child)
Functional hemispherotomy (2 children)	Seizure free (2 children)	None
Corpus callosotomy (6 children)	>50% Seizure reduction (3 children)	None

functional hemispherotomies are seizure free.

There is one other centre performing epilepsy surgery in Malaysia (Hospital Universiti Sains Malaysia, Kota Bahru), though there is no available data with regards to the case load the centre handles.

### **DEFICIENCIES, PROPECTS FOR IMPROVEMENT OF EPILEPSY SURGERY SERVICE**

The efficacy and safety of Epilepsy Surgery in conditions as they exist in Malaysia, compare favorably with that in more developed centres. However, only a very small proportion of patients with refractory seizure who are potential surgical candidates managed to reach the epilepsy surgery programme. On the basis of epidemiological studies in developed as well as developing countries, Malaysia should on a conservative estimate have at least 2000-3000 potential Epilepsy Surgery candidates.<sup>4</sup> However, our epilepsy surgery programme has performed only an average of 12 surgical procedures per year.

Several reasons may account for the low case load. This include lack of "full time"

Epileptologists as well as paucity of Neurologists and Neuroradiologists with the knowledge and interest in presurgical evaluation. There is a skewed distribution of neurology manpower, leading to the poor reach of the present program, especially to parts of the country outside Kuala Lumpur and it's outskirts. About 75% neurology expertise available in Malaysia serves in the capital Kuala Lumpur and it's immediate outskirts, whereas 75% of the population live in the rest of the country. Sociocultural reasons for refusing epilepsy surgery do not seem to play an important role as only few patients so far has refused epilepsy surgery. As medical care at Hospital UKM is subsidized and there is a facility for those in low income groups to have a waiver of hospital costs, economic factors also do not appear to be the reason for the low case load.

The reach of the present programme can be enhanced by education of General Physicians, Paediatricians and Radiologists who are serving in areas outside the capital Kuala Lumpur and it's immediate outskirts. There is also a need for a better awareness among the public as well as clinicians with respect to the efficacy as well as the safety of the current epilepsy surgery programme.

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