

Current status and future direction of epilepsy surgery in Asia

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Epilepsy surgery is a proven therapeutic modality for patients suffering from intractable epilepsies.^{1,2} With advances in technologies including neuroimaging and electrophysiological monitoring, the clinical application of epilepsy surgery has rapidly expanded to international epilepsy communities.

For epilepsy surgery in Asia, Japan was the leader but its practice was once largely abandoned due to social criticisms related to its misuse as a psychosurgery in early 1970's. A modern concept of epilepsy surgery in Asia was initiated by Japan, Korea, and Taiwan in 1980's and has rapidly spreaded to China, Singapore, Hong Kong, and India during 1990's. Considering the total number of patients suffering from epilepsy in Asia, the number of surgical candidates in this region should be much higher than the numbers in other regions. However, despite its seemingly

widespread practices in Asia, any meaningful information about the number of surgical cases performed annually, the quality of programs, protocols of presurgical evaluation, or surgical outcomes, etc., have not been available yet. This is certainly a serious handicap for the promotion of epilepsy surgery as a reasonable therapeutic modalities for patients suffering from refractory seizures in our region. For Asian Oceanian Epilepsy Congress, it seems crucial to gather the information about the current practice of epilepsy surgery from its member countries to provide the standards of surgical programs and the direction of future progress in our region.

For the purpose of gathering basic information on the current status of epilepsy surgery in Asia, I distributed a survey questionnaire to the key epileptologist in each nation. A total of 11 nations responded to the questionnaire. Epilepsy surgery

Table 1: Availability and utilization of epilepsy surgery in Asian countries

Countries	Population (million)	Epilepsy Surgery Programs			Prevalence (incidence) of pts during surgery	Degree of utilization (%)	Professional organization
		availa- bility	pediatric services	no. of cases/yr			
Hong Kong	6.8	Yes	Yes	40	4,600 (270/yr)	0.9	NA
India	1,000.0	Yes	No	100	68,000 (40,000/yr)	0.15	A
Indonesia	210.0	Yes	No	10	14,000 (8,400/yr)	0.07	NA
Japan	120.0	Yes	Yes	500	8,200 (4,800/yr)	6.1	A
Korea	47.0	Yes	Yes	300	3,200 (1,880/yr)	9.4	A
Mongolia	2.5	No	No	–	170 (100/yr)	–	NA
Philippines	82.0	Yes	Yes	10	5,500 (3,200/yr)	0.18	NA
Singapore	4.2	Yes	Yes	10	300 (170/yr)	3.6	NA
Taiwan	23.0	Yes	Yes	60	1,500 (920/yr)	4.0	NA
Thailand	67.0	Yes	Yes	50	4,500 (2,180/yr)	1.1	NA
Vietnam	80.0	No	No	–	5,400 (3,200/yr)	–	NA
Total	1,560.5	9/11	7/11	1,070	112,400(25,900/yr)	0.95	3/11

Prevalence = population x prevalence (0.75%) x localization related epilepsies (60%)

x intractability (30%) x surgically respectable epilepsy syndrome (50%) = population x 0.00068

Incidence = population x incidence (45/100,000/yr) x localization related epilepsies (60%)

x intractability (30%) x surgically respectable epilepsy syndrome (50%) = population x 0.00004/yr

Degree of utilization = No of cases/yr ÷ prevalence x 100

NA = not available

A = available

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program was available in 9 nations and about a slightly more than a thousand cases were performed annually, which is extremely small compared to the calculated potential number of surgical candidates in this region. The degree of utilization of epilepsy surgery (number of surgery/yr/number of surgical candidates x 100) was less than 1%, which indicates an extreme underutilization of epilepsy surgery in our region (Table 1). Among 9 nations having epilepsy surgery, 8 conducted a variety of epilepsy surgery including anterior temporal lobectomy, lesionectomy, and non-lesional neocortical resections. Among invasive EEG monitoring, subdural electrodes were most often used (8 countries) compared to depth electrodes (5 countries) and foramen ovale electrode (3 countries). MRI was available in all 9 countries, PET in 6 countries, and SPECT in 8 countries. However, flumazenyl-PET was available in only one country and subtraction ictal SPECT co-registered to MRI (SISCOM) in 3 countries.

For the questionnaire about opinions for future directions of epilepsy surgery in Asia, (1) 8 countries agreed to organize a regional society of epilepsy surgery as a division of Asian Oceanian Association of Epilepsy/Commission on Asian and Oceanian Affairs; (2) All 11 countries agreed to establish a network system among established epilepsy surgery centers; (3) 9 countries agreed to operate a regional epilepsy surgery registry system, and (4) All or a great majority proposed to (i) establish at least one program in each country, (ii) set-up guidelines of surgical program applicable to our regional standard, (iii) publish the list of available epilepsy surgery programs, (iv) hold regional congress of epilepsy surgery regularly, and (v) conduct regional clinical trials.

In conclusion, epilepsy surgery has rapidly spread to many nations in our region, however, it is still at early stage of development and severely underutilized clinical practice in our region. All responding epileptologists agreed to Asian Oceanian Association of Epilepsy/Commission on Asian and Oceanian Affairs being the primary organization responsible for promoting epilepsy surgery as an important and more widely available therapeutic modality for patients suffering from intractable epilepsies in our region.

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