

후두엽과 두정엽 뇌전증에서의 임상적 및 뇌파상의 전파 양상



조 규 호

연세대학교 의과대학 신경과학교실

Clinical and electrographic spread patterns in occipital and parietal lobe epilepsy

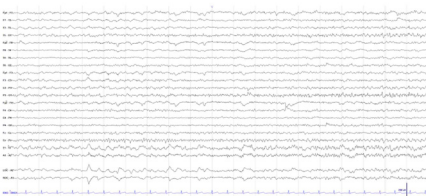
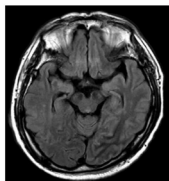
Kyoo ho Cho

Department of Neurology, Yonsei University College of Medicine, Seoul, Korea

M/57



- ER visit; “오른쪽 위시야에서 소복 입은 귀신이 반복해서 있다가 없어져요”
- Uncontrolled diabetes mellitus
- 정신과 예약후 퇴원
- 5일후 GTCS로 재내원



Parieto-occipital lobe epilepsy

- The tendency for **rapid propagation** of parieto-occipital seizures to the frontal and temporal lobes: **frequently misleading**
- The **most reliable** semiology of **posterior cortex** seizures: contralateral **somatosensory** auras and simple (**elementary**) **visual** auras.
- **Parietal**: vertigo, disturbances of body image, and visual illusions or hallucinations / tonic posturing in parietal epilepsy involving superior parietal lobule, whereas automatisms in EZ involving inferior parietal lobule
- **Occipital**: contralateral eye deviation, blinking, sensation of eye movements, nystagmus, and contralateral head version.
- Contralateral version and clonic activity, hypermotor or asymmetric tonic seizures, and oral or gestural automatisms when posterior cortex seizures **spread** to the dorsolateral frontal, SSMA, and limbic structures, respectively

3

Lateralizing/localizing Features of Auras

1.9116(91) 1006 26150162: 80192 8UD C11W1C91 169(0162

Auras

- **Sensory** auras
- **Painful** auras
- Peri-ictal headache
- Auditory auras
- **Visual** auras
- Ipsilateral ictal piloerection
- Ictal urinary urge
- Orgasmic auras

Sites

- Contra. **PSA, SSA, SSMA**; 89%
- Contra. **SSA > PSA**; 80%
- Ipsila. TLE (≈50%), CN 5 involve?
- Sup. temporal gyrus: bilateral in 80%
- Contra. **occipital or temporal**, 100%
- Ipsila. amygy/insula/hypothalami/AC
- non-dominant T; opecula; mesial F
- non-dominant or right T (>70%)

Parietal Lobe Seizures: auras and clinical features

1.9116(91) 1006 26150162: 80192 8UD C11W1C91 169(0162

1. Aura:

- somatosensory - tingling, a feeling of electricity; focal (PSA) bilateral, diffuse (secondary SSMA)
- visual - metamorphopsia, shortening, elongation
- aphasic - receptive or conductive language
- others - asomatognosia, vertigo, disorientation in space

2. Clinical feature – variable spread patterns

- Secondary activation of the frontal areas
- asymmetric tonic posturing of the extremities, unilateral clonic activity, contralateral version, hyperkinetic activity
- Spread to temporal lobe
- automatism/altered consciousness

Occipital Lobe Seizures

Visual aura, usually of elementary sensation

Sensation of ocular movement

Nystagmus, eye flutter

Forced eye blinking

Versive head and eye movements

Visual symptoms: positive or negative (even ictal amaurosis) occur in 50-60% of cases

~ The clinical features of occipital lobe complex partial seizures reflect different patterns of ictal propagation.

Relative incidence of auras in focal epilepsies

	Temporal ^a	Temporal ^b	Frontal ^b	Parietal ^b	Parietal ^b	Occipital ^b	Occipital ^b
	Blinder et al., 2009	Ferrari-Marinho et al., 2012	Jahs et al., 2008	Salamova et al., 1995b	Kim et al., 2004	Salamova et al., 1992	Lee et al., 2005
Incidence of auras	114/150 (76%)	180/205 (87%)	18/26 (69%)	77/82 (94%)	27/40 (67.5%)	37/42 (88%)	22/26 (85%)
Somatosensory	12%	9%	12%	63% (11% with disturbance of body image)	32.5%	-	-
Auditory	5%	6%	-	5%	2.5%	-	-
Visual	6%	14%	-	17%	10%	73%	77%
Olfactory	11%	2%	-	-	-	-	-
Gustatory	-	4%	-	-	7.5%	2%	-
Vertiginous	3%	12%	-	11%	10%	-	15%
Autonomic	1%	30%	12%	7.5%	-	-	-
Abdominal	26%	52%	-	1%	-	14%	7.7%
Cephalic	-	15%	30%	3%	-	12%	-
Psychic, Experiential	12%	16%	5%	-	-	9%	-
						(complex visual hallucination)	
Fear	14%	19%	19%	-	15%	2%	-
Affective (not fear)	-	6%	-	-	-	-	-
Other	-	-	8%	3%	2.5%	-	-
Unclassified	10%	6%	15%	8%	-	2%	-

^aPercentages refer to the frequency of a particular aura relative to the total auras reported; ^bPercentages refer to the number of patients reporting a particular aura.

Perven & So, 2015

Differences of aura characteristics among lobar epilepsies in lesional partial epilepsy

Aura	MTLE	LTLE	FLE	PLE	OLE	p value ^a
Eegnostic	34 (25.4)	7 (12.7)	3 (4.6)	0 (0)	0 (0)	<0.001
Autonomic	115	53	63	17	5	0.03
Emotional	22 (16.4)	7 (12.7)	4 (6.2)	1 (5.9)	1 (20.0)	0.222
Cephalic	10 (7.5)	6 (10.9)	4 (6.2)	1 (5.9)	2 (40.0)	0.172
Vestibular	2 (1.5)	3 (5.5)	3 (4.6)	1 (5.9)	1 (20.0)	0.088
Psychic	24 (17.9)	5 (9.1)	2 (3.1)	0 (0)	1 (20.0)	0.008
Visual	110	50	63	17	4	0.002
Somatosensory	5 (3.7)	5 (9.1)	2 (3.1)	4 (23.5)	2 (40.0)	0.063
Dysphasic	129	50	63	13	3	0.518
Olfactory	4 (3.0)	2 (3.6)	0 (0)	0 (0)	0 (0)	0.570
Whole body sensation	130	53	65	17	5	0.104
Auditory	3 (2.2)	1 (1.8)	0 (0)	2 (11.8)	0 (0)	0.159
Miscellaneous	131	54	65	15	5	0.04

MTLE, mesial temporal lobe epilepsy; LTLE, lateral temporal lobe epilepsy; FLE, frontal lobe epilepsy; PLE, parietal lobe epilepsy; OLE, occipital lobe epilepsy. Numbers in parentheses are percentages.

Ye et al., 2012

EEG features of PLE & OLE

- **LFLE**: more likely localized patterns than other types of FLEs and other extratemporal epilepsies, focal rhythmic beta or repetitive epileptiform discharges
- **MFLE**: more likely generalized or nonlateralized patterns, or no EEG change
- **PLE**: rapid, widespread, and variable propagation lateralized rather than localized patterns false localization
- **OLE**: widespread and variable propagation correct localization: approximately 50% false localization
- Postictal regional or lateralized delta activity or attenuation is reliable predictor of the hemisphere of seizure origin

Unilateral (ipsilateral) eye blinking

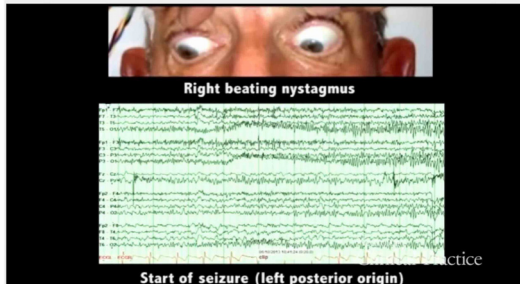


10

Ictal nystagmus in right OLE



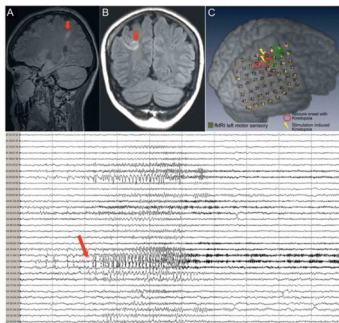
11



Epileptic nystagmus

- **Saccade area:** frontal, parietal, and supplementary eye fields
 - contralateral
 - do not cross midline
- **pursuit area:** middle temporal (MT) and medial superior temporal (MST) area
 - eyes drift ipsiversively to the eccentric position, and reflexive resetting quick phases →
 - contralateral side
 - crossing the midline

EPILEPTIC KINETOPSIA: SUPERIOR PARIETAL LOBULE AND INTRAPARIETAL SULCUS



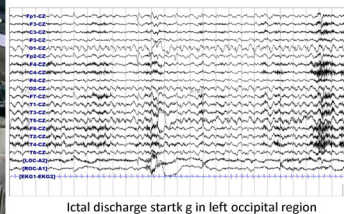
Neurology 83 August 19, 2014

Versive seizure in right OLE



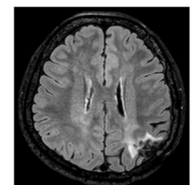
15

Left OLE: Ipsilateral nonversive head turning and eyeball deviation

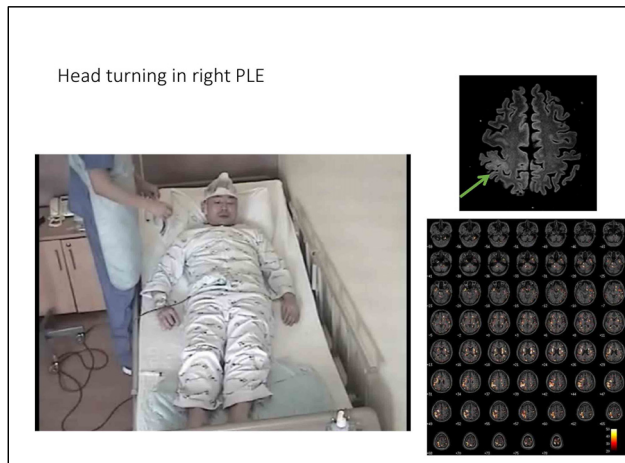


Ictal discharge starting in left occipital region

Gyratory movement initiated by a forced version followed by a rotation toward the contralateral side of seizure onset in left T-PL



17



M/33

(1) Head trauma

- 1984년 자전거에서 떨어져 head trauma

(2) 1993년 (13세) onset Occipital lobe epilepsy with drug resistance

- 1996년부터 시내에서 AED 복용
- 2000년 Drug intoxication event
- 2014년 6월 GTCS 3차례 발생, 수술적 치료 등 받고자 본원 내원

(3) MRI: Left occipito-parietal encephalomalacia (considered to be related with remote severe head trauma (4 yrs old.))

M/33

(1) Symptom:

- #1 Elementary hallucination in right hemi-visual field then head version to right side, without LOC (4-5 times/week)
- #2 (1) + 2ndarily GTCS
- #3 visual blurring and motionless staring, automatisms (1 time / week)

(2) EEG onset (Video-EEG monitoring 2014/10/13~20):

- (1) most symptomatic EEG: Left Temporo-occipital rhythmic fast or theta activities
- (2) some subclinical Sz: mixture of rhythmic alpha and theta in Right temporo-occipital region
- (3) 2 episode clinical Sz (sz type #3): associated with discharges with right temporo-occipital onset

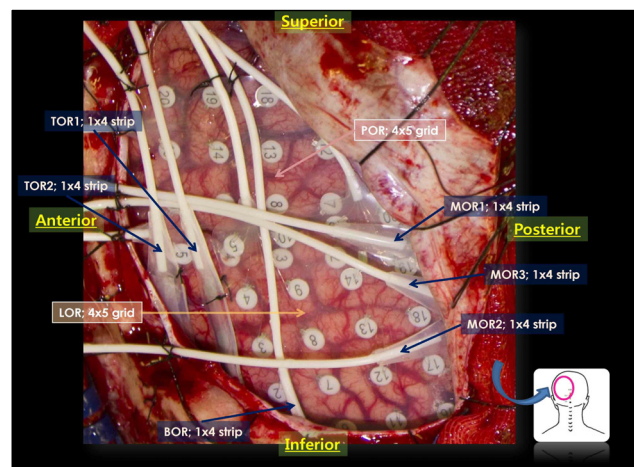
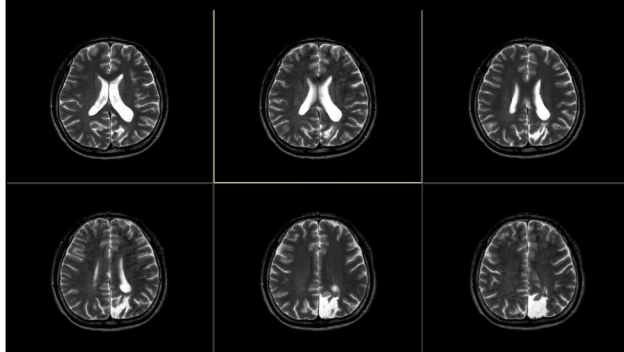
(3) Visual field test (Humphrey test): No visual field defect

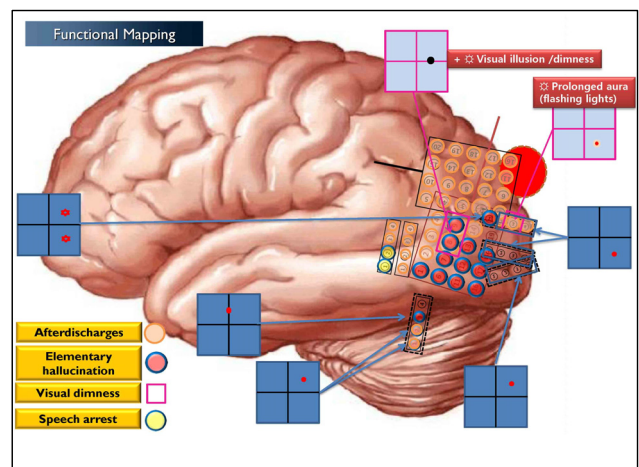
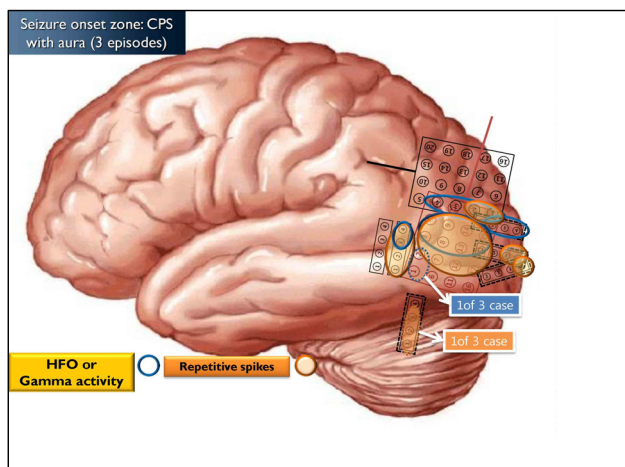
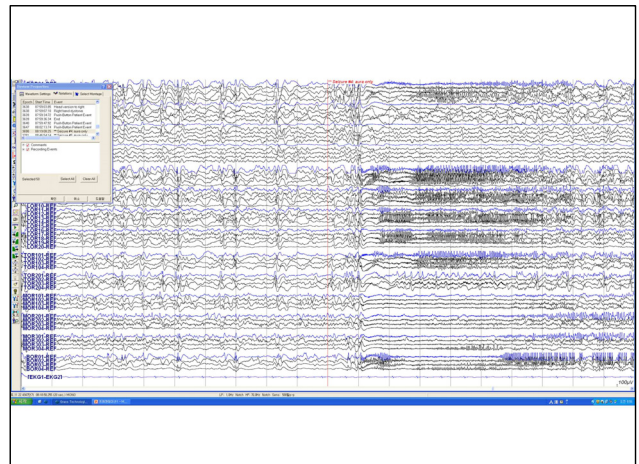
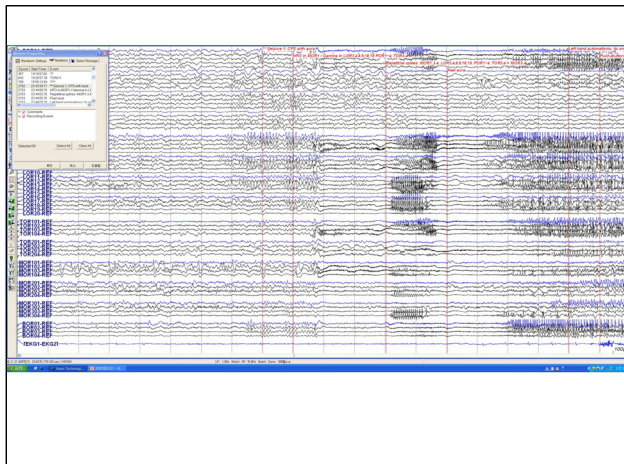
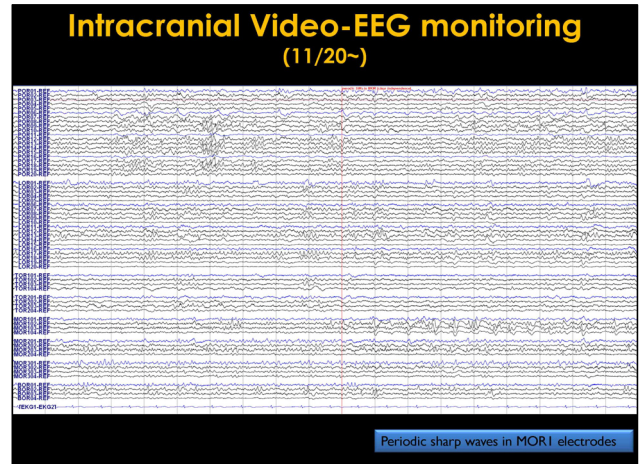
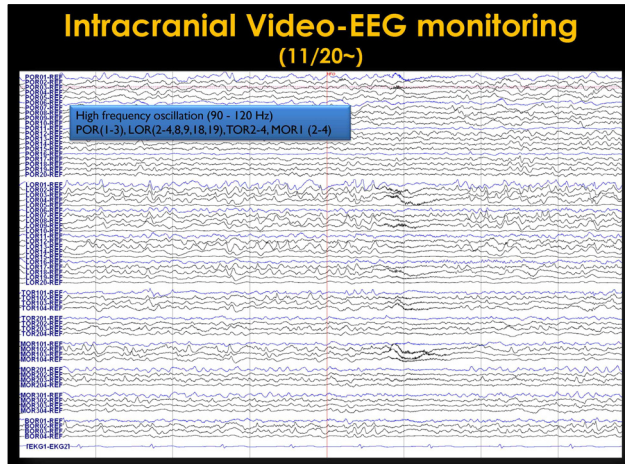
(4) AEDs: LTG 300, VPA 1000, PHT 200, PB 120, LEV 1500, ZNS 200

Interictal EEG



Brain MRI 2014.6.17

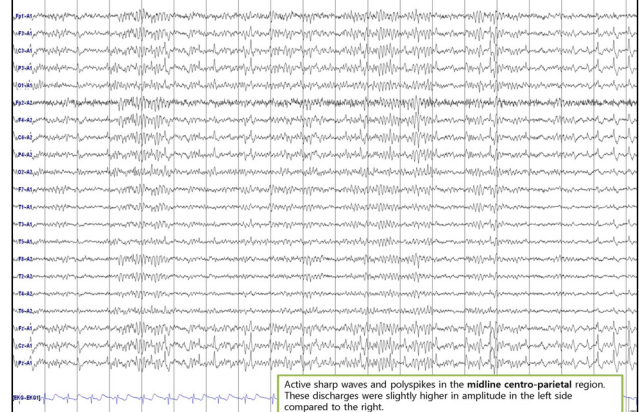




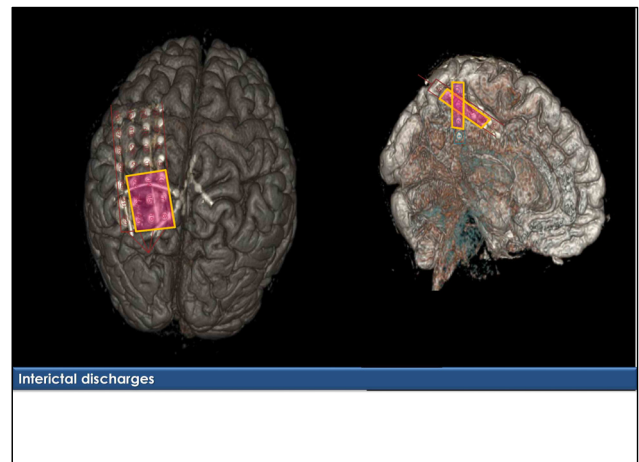
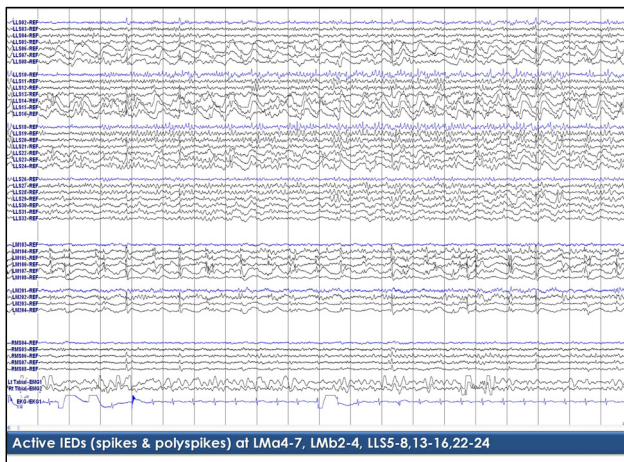
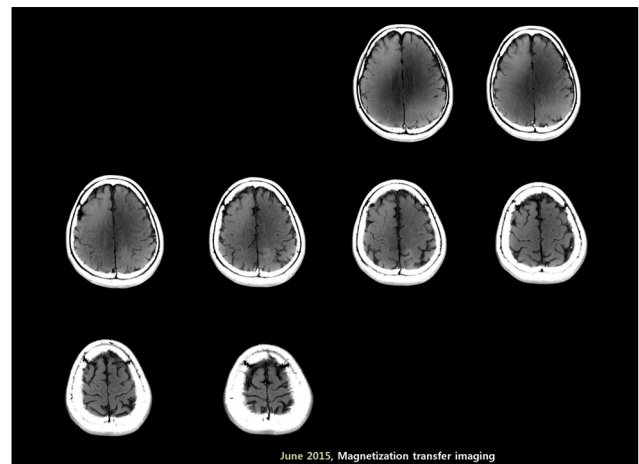
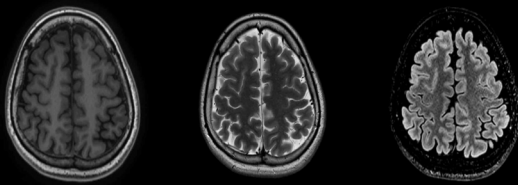
F/26

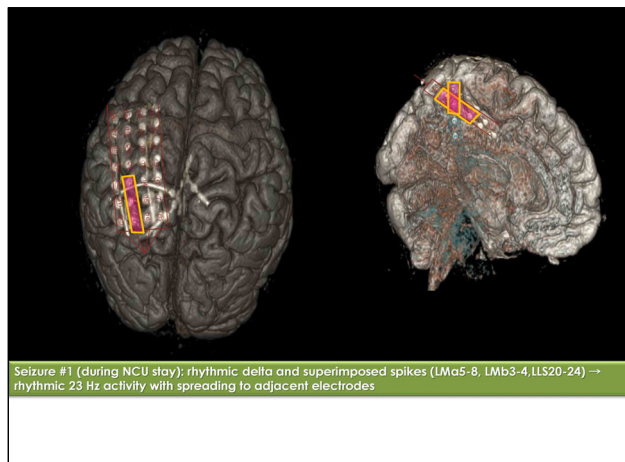
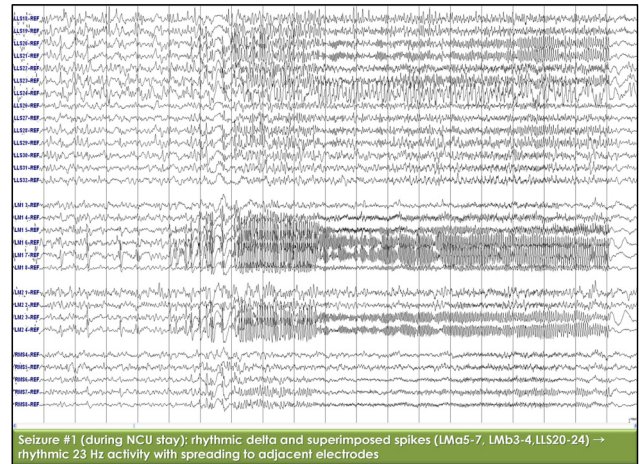
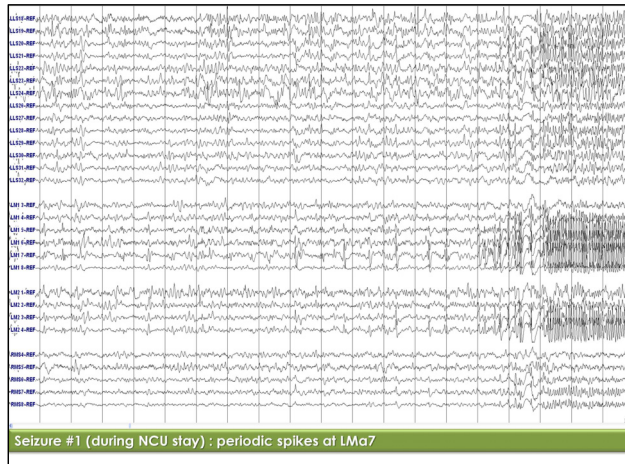
- Rt. handedness
- Education: 4년제 대학교 졸업
- **Type 1: Complex partial seizure with sensory aura**
 - Onset : 중학생
 - Aura: 우측 옆구리가 시린 느낌
 - Ictus: looking around → head version to right, bilateral asymmetric tonic posture
 - Duration: 30 sec.~ few minutes
- **Type 2: Secondly generalized seizure after Type 2**
 - frequency (type 2 or 3): 2 – 3times / month

VEEG monitoring



June 2015: T1 , T2 and FLAIR-GD images

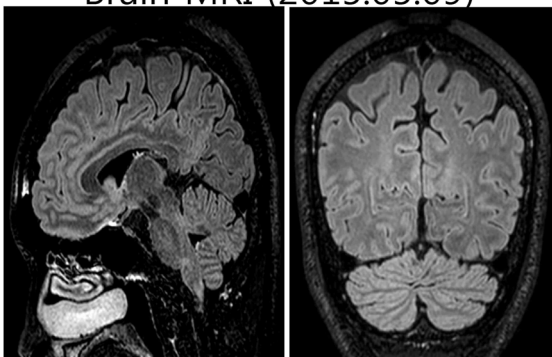




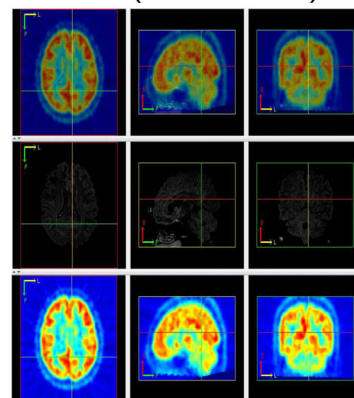
M/31

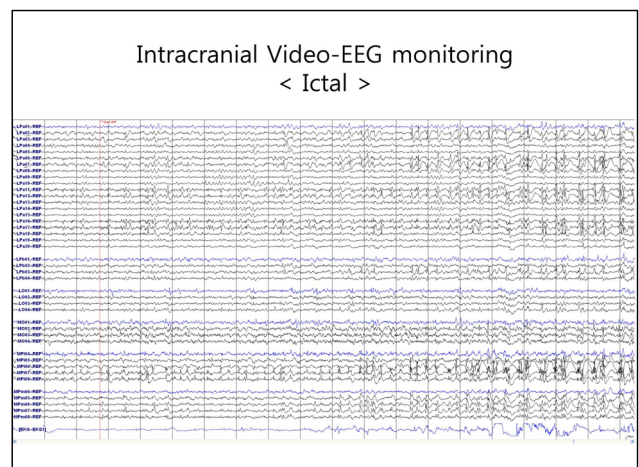
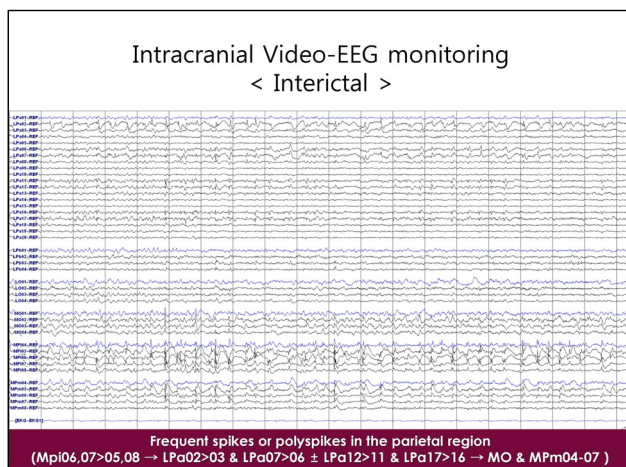
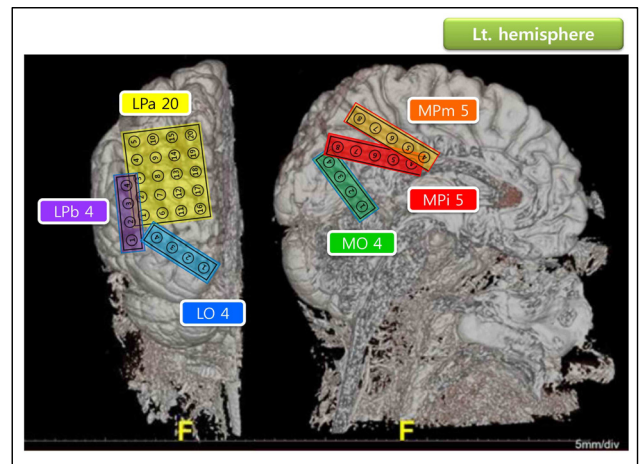
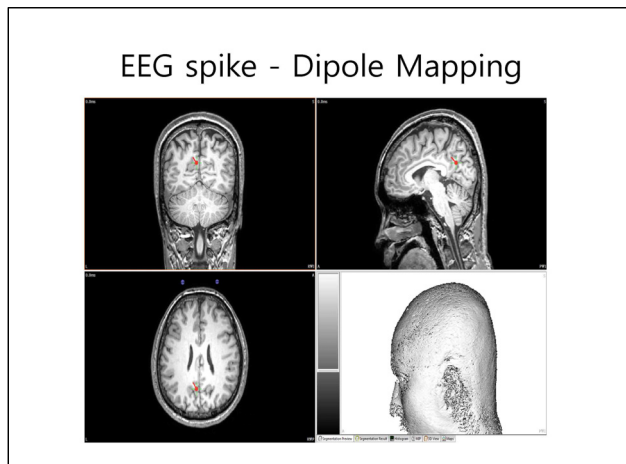
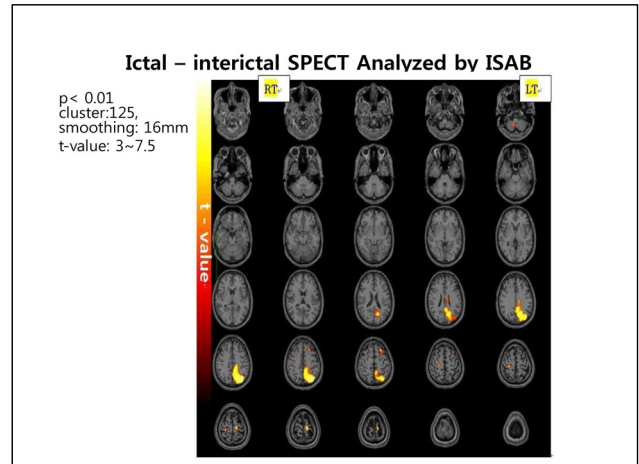
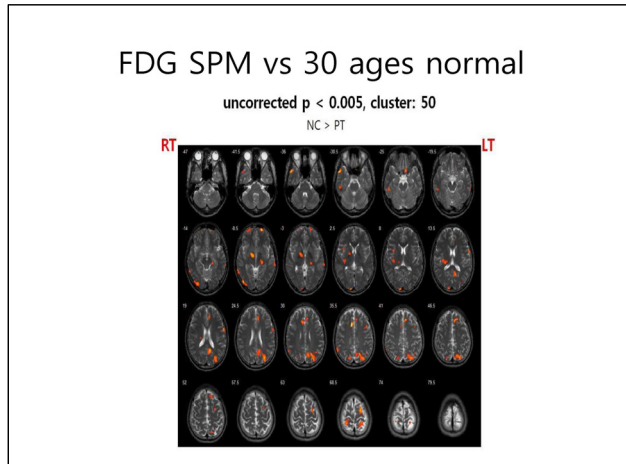
- Type: Focal seizure with impairment of consciousness or awareness (Complex partial seizure)
 - Onset: 1996년
 - Aura : **dizziness** (knowledge of impending seizure)
 - Character : LOC(+), **motionless staring, silly smile**
 - Postictal state : confusion
 - Duration : 1 min
 - Frequency : 3~4개월에 한번

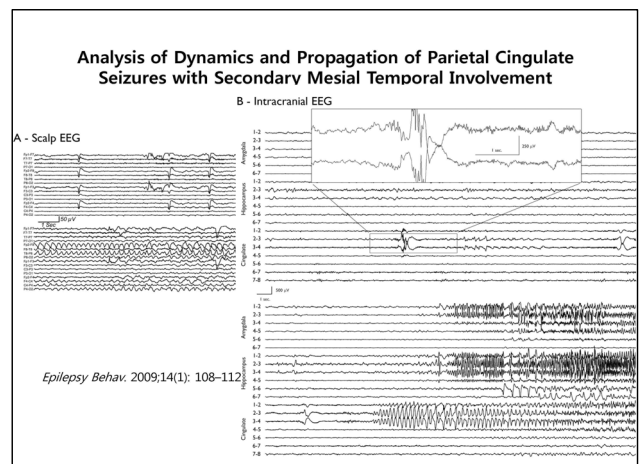
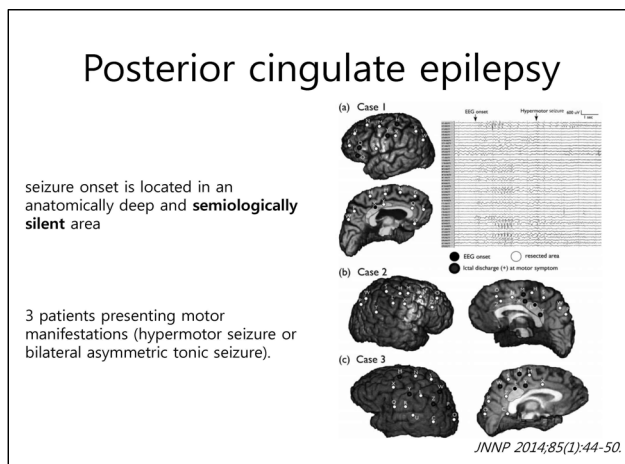
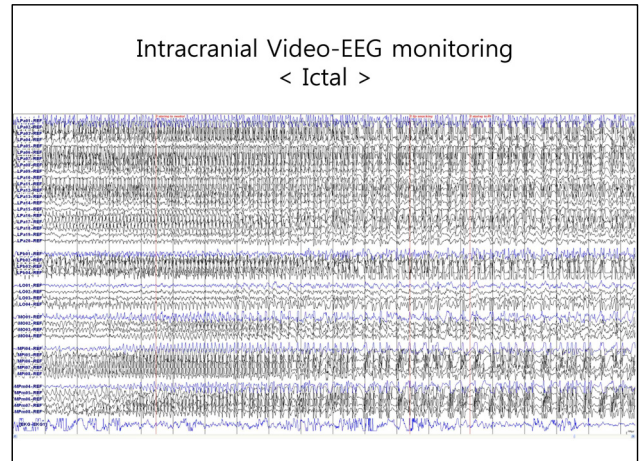
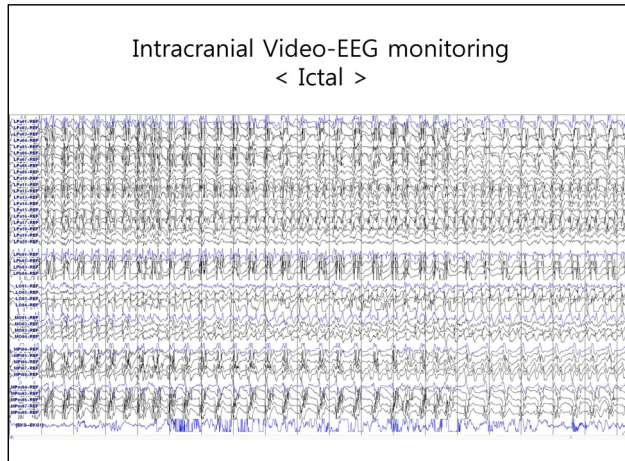
Brain MRI (2015.05.09)



Brain MRI (2015.05.09) - PET







Summary

In PLE & OLE, with frequent and rapid ictal propagation, various symptoms may appear.

Reliable semiology: **somatosensory** auras and simple (**elementary**) **visual** auras

Careful history taking, EEG & neuroimaging might help identify epileptogenic zone