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: 가 . 가 22 17 - 46 3:19 . , 3 CT . 11 . 가

: 가 13 , cyclosporine 가 3 , FK506 가 1 , 4 , 1 (12 ), (13 ), (15 ), (3 ), (2 ) . 15 , T2WI , T1WI . 22 20 , 2 . 22 9 , 8 , 5 , 5 , 2 , 1 . 1 11 8 , 1 2 . CT . 가 , 2 가 11 9 : 가 , , , 가 ,

가 (reversible posterior leukoencephalopathy syndrome) 1996 Hincley (1) 가

, , , , , cyclosporine, FK506(tacrolimus), interfer - on alpha

1가  
2  
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4

가가

2000 7 19 2001 8 6 .

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(2).  
가

MRI 가  
23

CT  
MRI) T1  
T2

가 가  
(

17 - 46  
MRI

가 3 , 가 19  
, MRI

1 - 3 MR 16

0.5T(Gyrosan T5, Philips, Eindhoven, Netherlands), 3

가 1.5T Magnetom Vision Plus(Siemens, Erlangen, Germany), 3 1.5T(Signa; GE Medical System, Milwaukee, U.S.A.)

(1 -

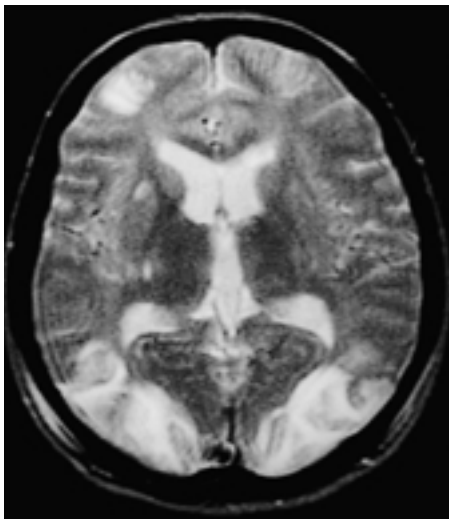
5). 가

MRI

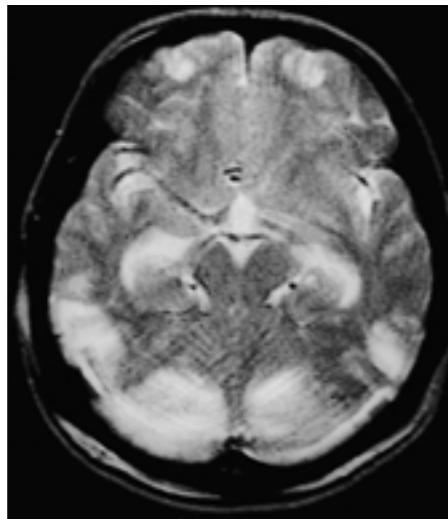
(FOV) 20 - 22 x 20 - 22 cm , 5 -  
6 mm, 0.6 - 1 mm, matrix size 256 x 256,

2

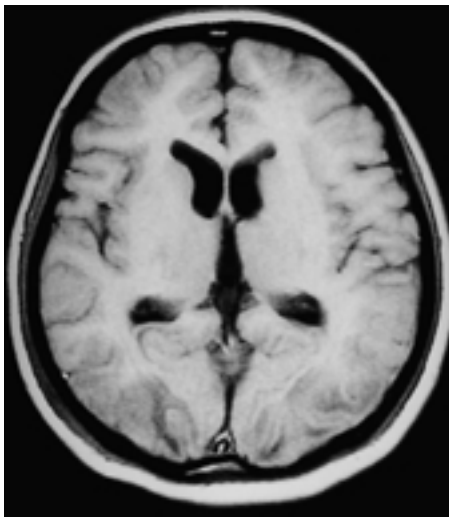
T1 (TR/TE=450 - 500/12 - 20 ms) T2



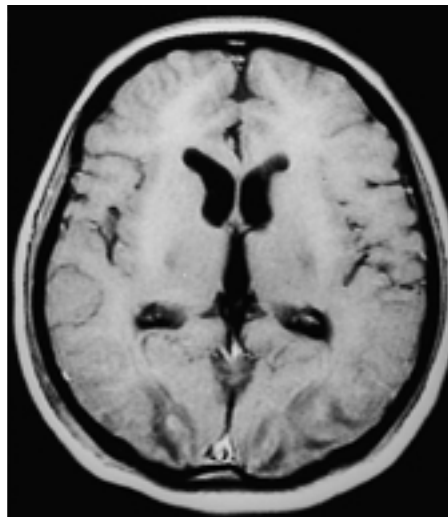
A



B



C



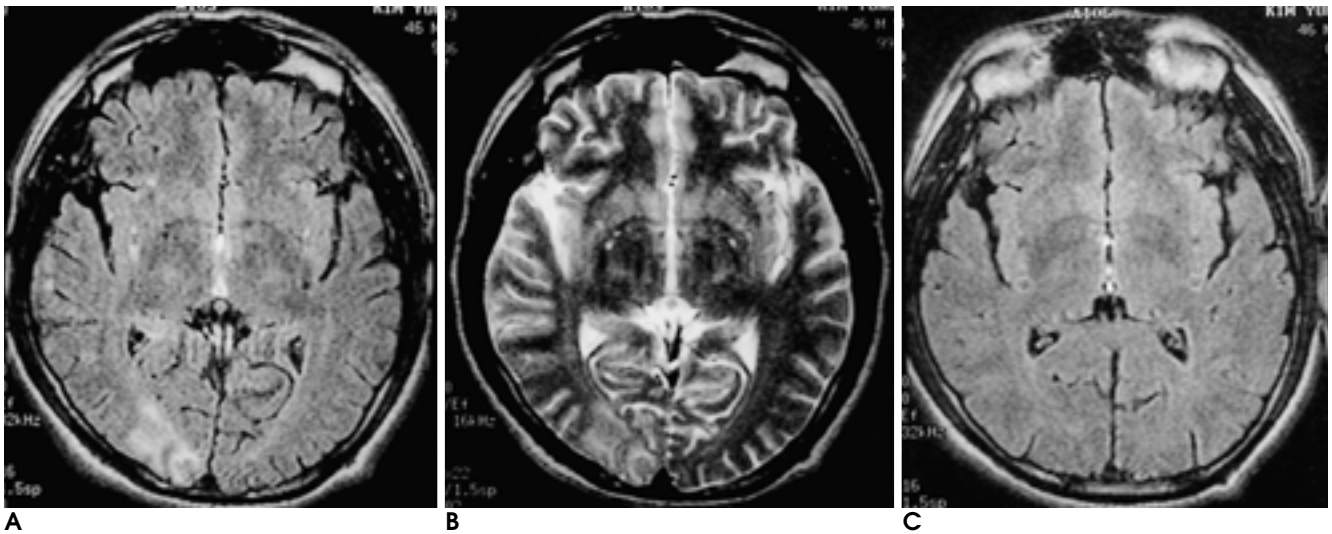
D

**Fig. 1.** 30-year-old woman with eclampsia at 34 weeks 'gestation.

**A, B.** Axial T2-weighted MR images show multiple high signal intensities in the cortex and subcortical white matter of bilateral parietooccipital, posterior temporal and frontal lobes, and cerebellar hemispheres. Several high signal foci are also demonstrated in the both basal ganglia.

**C.** On axial T1-weighted image, these lesions show low signal intensities.

**D.** Axial postcontrast T1-weighted image reveals slight enhancement.



**Fig. 2.** 46-year-old man with complicated migraine.

**A, B.** FLAIR(**A**) and T2-weighted images(**B**) reveal focal high signal intensity in the cortical and subcortical white matter of right occipital lobe. FLAIR image is more sensitive detecting the lesion.

**C.** Follow-up FLAIR image after 45 days demonstrates complete resolution.

**Table 1.** Causes of Reversible Posterior Leukoencephalopathy Syndrome(n = 22)

Causes	Case No.(%)
Eclampsia	
During pregnancy	6(27%)
During puerperium	7(32%)
Immunosuppressive therapy	
Cyclosporine	3(14%)
FK506	1(4.5%)
Renal insufficiency	4(18%)
Complicated migraine	1(4.5%)

**Table 2.** Clinical Manifestations in the Patients(n = 22)

Clinical Manifestations	No. of Cases
Headache	12
Visual Disturbance	13
Seizure	15
Focal Neurologic Sign	3
Altered Mental Status	2
Blood Pressure	
Hypertension	15
Mild*	3
Moderate <sup>+</sup>	5
Severe <sup>‡</sup>	7
Normotension	7

\*:systolic 140-159, diastolic 90-99

+ :systolic 160-179, diastolic 100-109

‡:systolic 180, diastolic 110

(TR/TE=1800 - 2300/90 - 120 ms)

11                      1 kg    0.1 mmol    Gadopentetate  
dimeglumine(Magnevist; Shering, Berlin, Germany)

T1                      ,  
(                      MRA)                      . 3

MRI    CT                      . 22                      11  
MRI                      .

가

MRI

MRI

22

13 ,                      cyclosporine 3 , FK 506 1  
,                      4 ,                      (complicated migraine) 1

(Table 1).                      13                      6

,                      7

가

5

2 ,

2

3

(1.3 - 1.83 mg/dl).

BUN                      creatinine

(BUN; 45.7 - 128.9, creatinine; 2.5 - 11.1).                      3

,                      1

가

12 ,

15 ,

13 ,

2 ,

3

140 mmHg,

90 mmHg

: 가

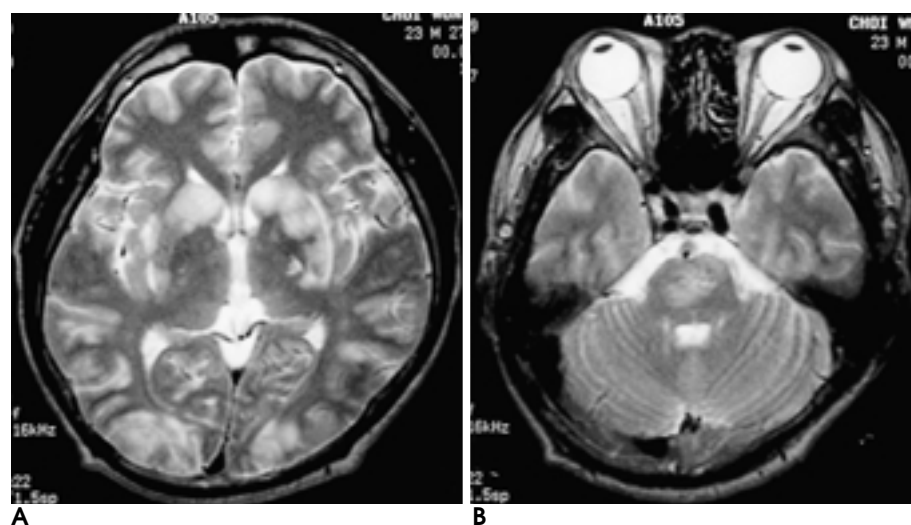
15 , 7  
( 140 - 159, 90 - 99), MRA 1  
( 160 - 179, 100 - 109),  
( 180 , 110 )  
3, 5, 7 (Table 2).  
가 3 , 2 ,  
1 . MR 20  
, 가 2  
22

MRI 11 9  
(Fig. 2, 3), 2  
가 1

가 9 ,  
8 , 5 , 5 , 1 , 2  
(Table 3). MR T2  
, T1  
11  
8 , 1  
(Fig. 1), 2  
FK506 1

**Table 3.** Locations of the Lesions on MR Imaging in the Patients(n = 22)

Locations	No. of Cases
Parietooccipital	22
Basal ganglia	9
Posterior Temporal	8
Frontal	5
Cerebellum	5
Pons	2
Thalamus	1

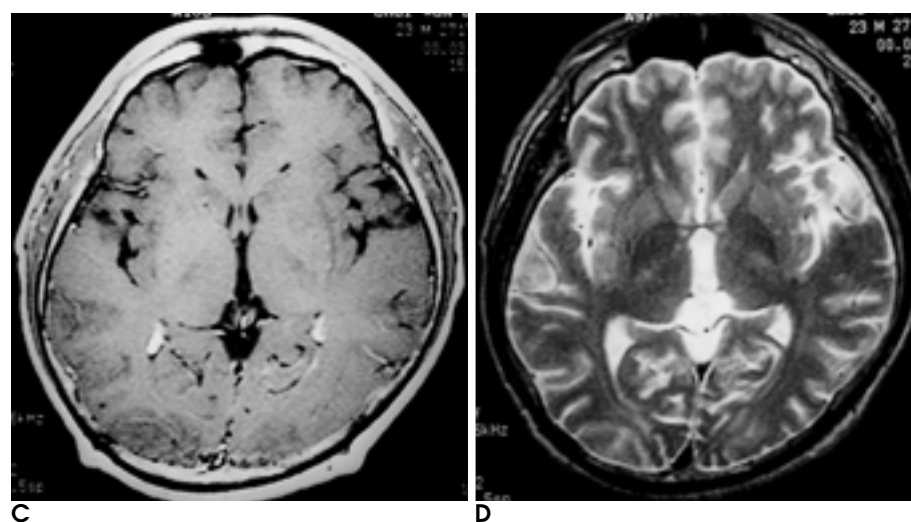


**Fig. 3.** 23-year-old man with chronic renal insufficiency.

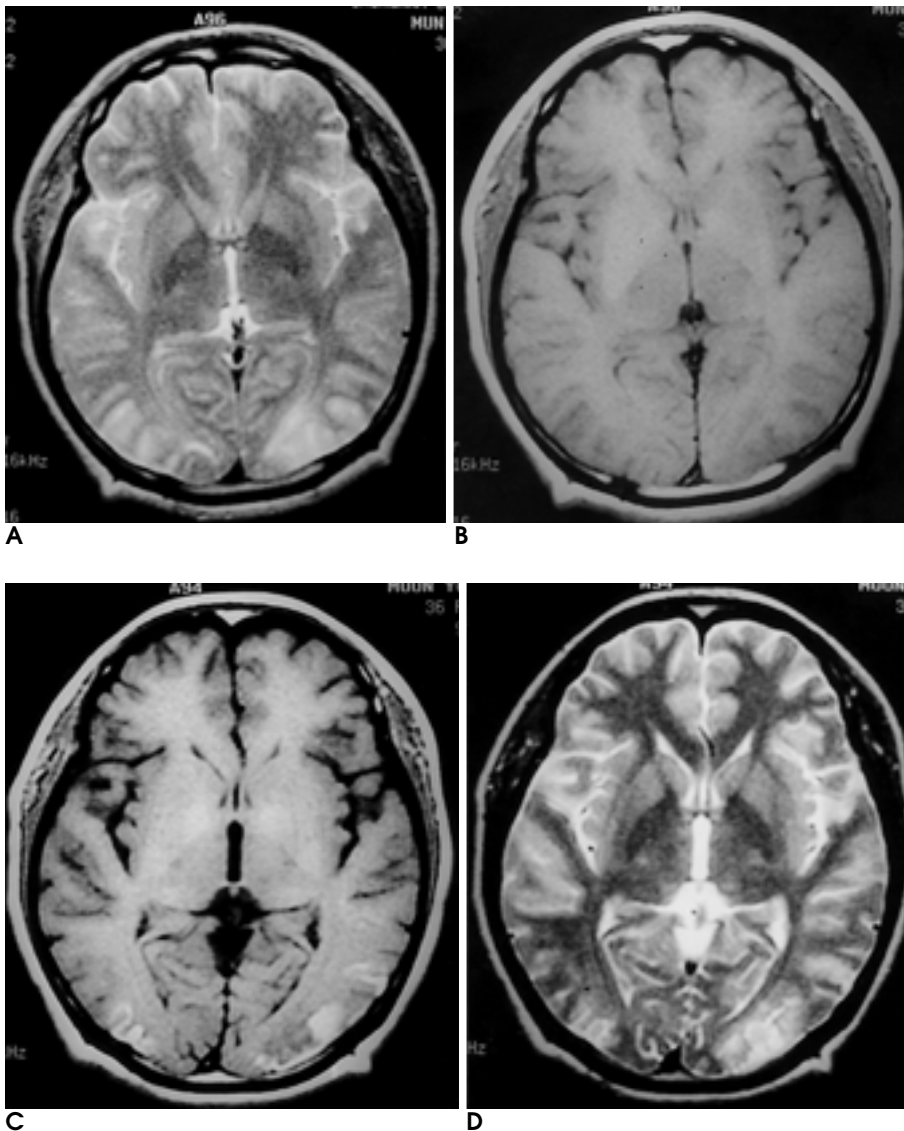
**A, B.** Axial T2-weighted MR images show multiple high signal intensities in both parietooccipital lobes, both basal ganglia, and pons.

**C.** Axial postcontrast T1-weighted image reveals low signal intensities with no evidence of significant enhancement.

**D.** Follow-up MR image after 7 days demonstrates nearly complete resolution of the abnormal lesions.



가  
가 (Fig. 4).  
가  
가 (calcarine)  
occipital lobe) 가 (paramedian  
(1, 6). 가 (1, 4).  
가  
가 (4).  
(4).



**Fig. 4.** 36-year-old woman with eclampsia at 31 weeks 'gestation. **A, B.** Axial T2-weighted image(**A**) shows increased signal intensities in the cortical and subcortical white matter of both parietooccipital lobes. On T1-weighted image(**B**), these lesions show slightly low signal intensities. **C, D.** Follow-up T1-and T2-weighted images after 20 days show hemorrhagic infarction.

[illegible]

가 .

(3).

20%

가

가 . CT ,

MR T2

가 가

가

(20, 21).

가

가

MR

가

가

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## Reversible Posterior Leukoencephalopathy Syndrome<sup>1</sup>

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**Purpose:** To review reversible posterior leukoencephalopathy syndrome.

**Materials and Methods:** We reviewed 22 patients (M:F = 3:19; age, 17 - 46 years) with the characteristic clinical and imaging features of reversible posterior leukoencephalopathy syndrome. All underwent brain MRI, and in three cases both CT and MRI were performed. In one, MRA was obtained, and in eleven, follow-up MR images were obtained. We evaluated the causes of this syndrome, its clinical manifestations, and MR findings including the locations of lesions, the presence or absence of contrast enhancement, and the changes seen at follow-up MRI.

**Results:** Of the 22 patients, 13 had eclampsia (six during pregnancy and seven during puerperium). Four were receiving immunosuppressive therapy (three, cyclosporine; one, FK 506). Four suffered renal failure and one had complicated migraine. The clinical manifestations included headache (n = 12), visual disturbance (n = 13), seizure (n = 15), focal neurologic sign (n = 3), and altered mental status (n = 2). Fifteen patients had hypertension and the others normotension. MRI revealed that lesions were bilateral (n = 20) or unilateral (n = 2). In all patients the lesion was found in the cortical and subcortical areas of the parieto-occipital lobes; other locations were the basal ganglia (n = 9), posterior temporal lobe (n = 8), frontal lobe (n = 5), cerebellum (n = 5), pons (n = 2), and thalamus (n = 1). All lesions were of high signal intensity on T2-weighted images, and of iso to low intensity on T1-weighted images. One was combined with acute hematoma in the left basal ganglia. In eight of 11 patients who underwent postcontrast T1-weighted MRI, there was no definite enhancement; in one, enhancement was mild, and in two, patchy. CT studies showed low attenuation, and MRA revealed mild vasospasm. The symptoms of all patients improved. Follow-up MRI in nine of 11 patients depicted complete resolution of the lesions; in two, small infarctions remained but the extent of the lesions had decreased.

**Conclusion:** Reversible posterior leukoencephalopathy syndrome develops in patients with toxemia of pregnancy, renal insufficiency or complicated migraine, and those who undergo immunosuppressive therapy. The characteristic MR finding is edema in cortical or subcortical areas of the parietal and occipital lobes, without enhancement after Gd-DTPA injection. Early recognition of this readily treatable condition may obviate the need for extensive, invasive investigations, and prompt treatment can lead to a favorable prognosis.

**Index words :** Brain, MR

Brain, diseases

Brain, edema

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