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$$\vdots$$

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19

12

23

2

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19

17 (89%)

가

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2

가

72

4.2

55 (76%)

. 17 (24%)

12 (71%)

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17

16

가

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3

5

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가

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(Behcet's disease)

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3 3 3 3 3

가 4 - 49%

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(1 - 3).

(3-7).

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ulbar palsy), , , (8 - 10).

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1997 (02 - 1997 - 347 - 0) 13 , 가 6 . 17 47

1999 11 5 . 2000 6 21 . 34 .

1991 9 1997 1

19

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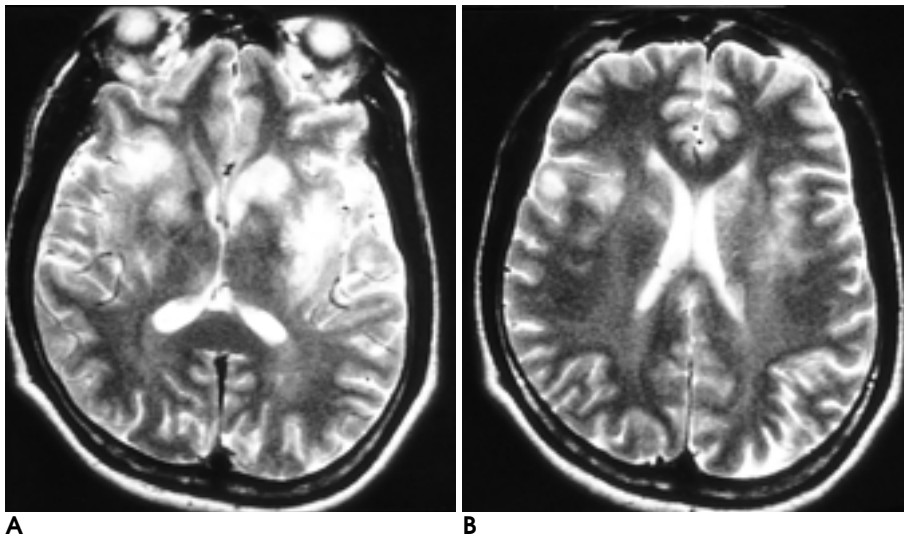
154

16 . 7 (sulcus)  
 (Fig. 2B) 2 1  
 T2  
 가 17 3 T2  
 3 (Fig. 4).  
 . 2  
 (interpeduncular cistern) 2 T1  
 (Fig. 3A) 1 T2  
 (Fig. 3B).

**Table 1.** Distribution of Brain Parenchymal Lesions in 17 Patients with Neuro-Behcet 's Disease

Case	Brainstem			BG	Thal	IC	Hemisphere					HC	CP
	Med	Midbr	Pons				FL	PL	TL	Insula	OL		
1		+	+	+	+	+							
2		+	+		+	+							
3			+				+						
4			+										+
5		+	+	+			+		+	+		+	
6	+	+	+		+	+							
7	+	+	+			+					+		
8		+	+		+								+
9			+		+			+					
10		+	+	+		+	+						
11		+	+		+	+							+
12		+	+	+	+								
13		+	+				+	+					
14		+	+	+	+	+		+		+			
15		+	+				+						+
16		+		+			+						
17				+			+						
Total	2	13	15	7	8	7	7	3	1	2	1	1	4
(patients)		16							10				

Abbreviations: Med: medulla, Midbr: midbrain, BG: basal ganglia, Thal: thalamus, IC: internal capsule, FL: frontal lobe, PL: parietal lobe, TL: temporal lobe, OL: occipital lobe, HC: hippocampus, CP: cerebellar peduncle

**Fig. 2.** Multiple parenchymal lesions in the cerebral hemisphere in a 45-year-old man.

**A, B.** T2-weighted axial MR images (TR=3700,TE=93) show multiple ill-defined high signal intensities in the right frontal lobe, the both basal ganglia, and the periventricular white matter.

centrum semiovale

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(Fig. 6A - D).

(3 - 3 )

가 10

12

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(Fig. 5).

(1 - 2 )가

35 10 (29%)  
(63%)가 가 3

22

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2

4

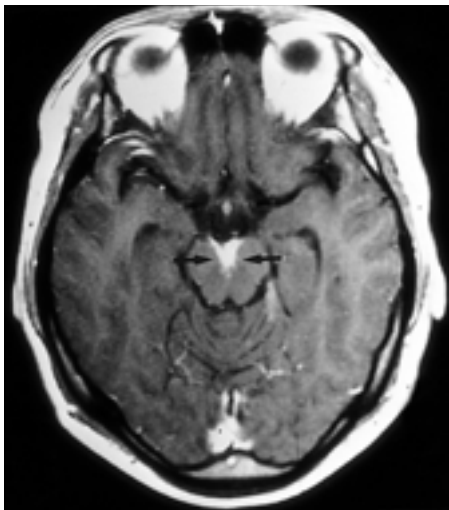
(5, 6),

. 1

T2

T1

T2



A

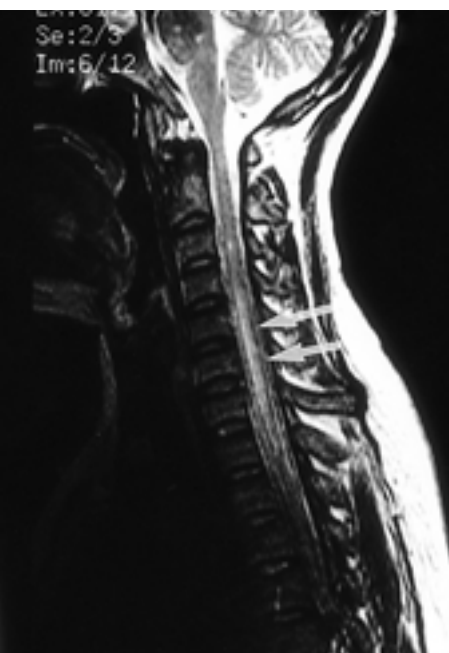
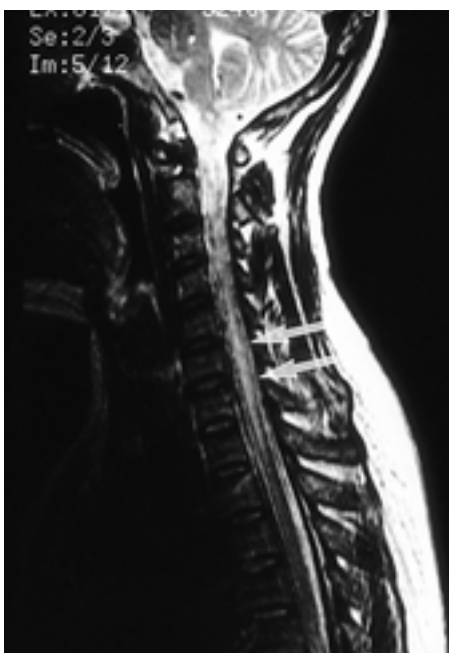


B

**Fig. 3.** Leptomeningeal enhancement in a 18-year-old man.

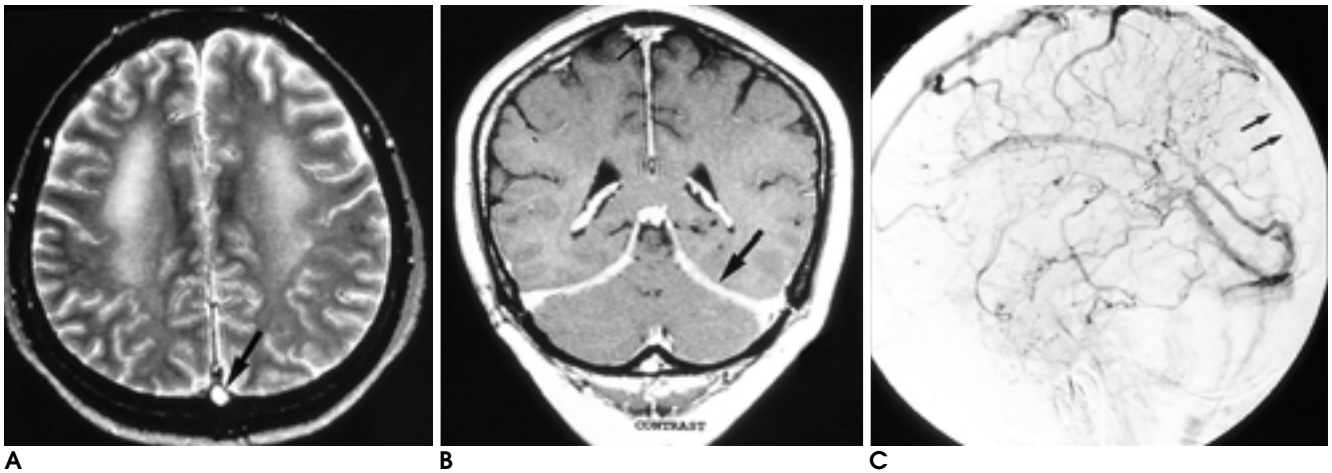
**A.** Contrast-enhanced axial T1-weighted MR image (TR = 513, TE = 12) shows strong enhancement (arrows) in the interpeduncular cistern. A patchy non-enhancing lesion of T1 low and T2 high signal intensity was seen in the pons (not shown).

**B.** After treatment with steroid and immunosuppressants, one month follow up contrast-enhanced MR image (TR = 560, TE = 15) shows markedly decreased enhancement in the interpeduncular cistern. The pontine lesion remained as a small lacunar cavity (not shown).



**Fig. 4.** Spinal cord involvement in a 40-year-old woman.

Sagittal T2-weighted images show diffuse ill-defined lesion of high signal intensity (arrows) in the cervical and upper thoracic spinal cord. There are also multiple lesions in pons and medulla.

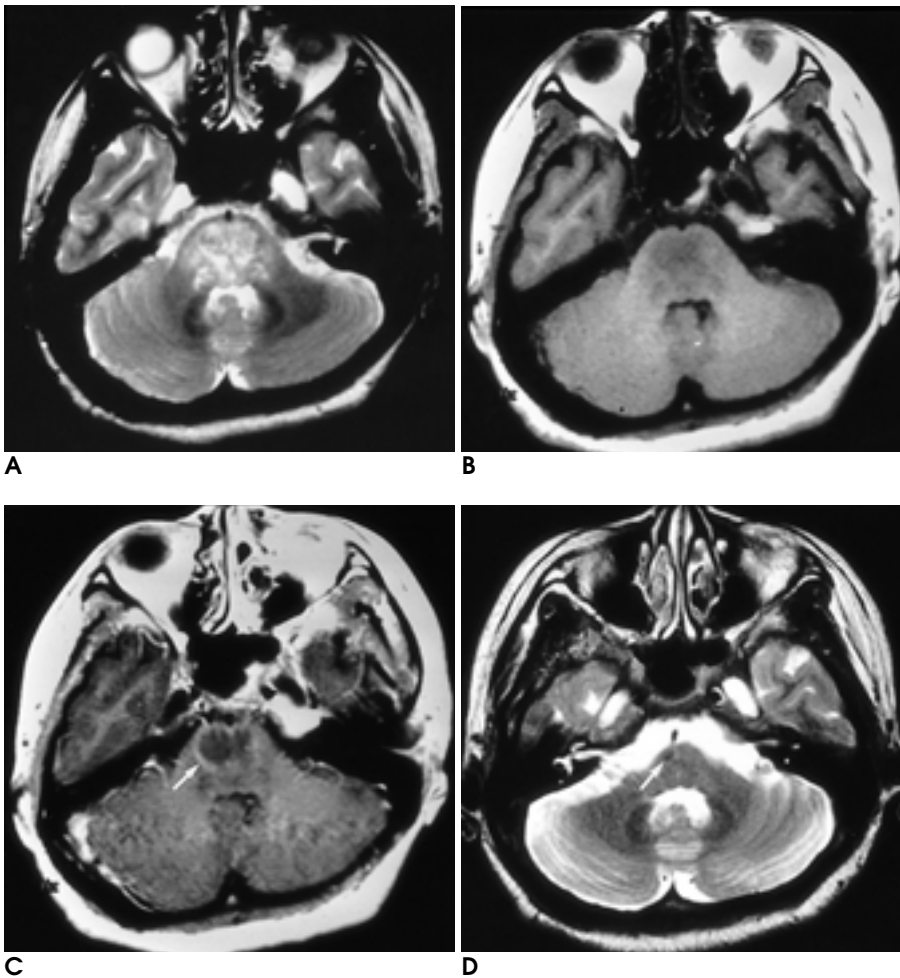


**Fig. 5.** Dural venous sinus thrombosis in a 50-year-old woman.

**A.** Axial T2-weighted MR image (TR = 2200, TE = 80) shows high signal intensity of thrombus in the posterior part of the superior sagittal sinus (arrow). Diffuse high signal intensity in the centrum semiovale is likely to be interstitial edema probably due to dural venous sinus thrombosis.

**B.** Contrast-enhanced coronal T1-weighted MR image shows filling defect (small arrow) in the central part of the superior sagittal sinus. The dura is thick and enhanced (large arrow).

**C.** Venous phase of cerebral angiography shows filling defect of the superior sagittal sinus (arrows). Numerous tortuous venous collaterals are also noted.



**Fig. 6.** Microhemorrhage and brainstem atrophy on follow-up MRI study in a 26-year-old woman.

**A.** Initial axial T2-weighted MR image (TR = 3500, TE = 90) shows ill-defined high signal intensity with swelling of the pons.

**B.** Initial axial T1-weighted MR image (TR = 416, TE = 11) shows ill-defined low signal intensity in the pons.

**C.** On initial contrast-enhanced axial T1-weighted MR image, the peripheral portion of the lesion is enhanced mildly (arrow).

**D.** Six months follow-up T2-weighted MR image (TR = 4000, TE = 98) shows complete resolution of the pontine lesion leaving a small dark signal intensity lesion suggesting focal hemorrhage in the right side of the pons (arrow). The pons appears moderately atrophied.

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(5, 11),

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(interpeduncular cistern)

4.2

1

가 (76%),

17

12

(3 - 5, 8, 12)

T2

T1

가

2

. AlKawi (3)  
T2

가

가

T2

(3, 10, 13)가

가

1 ,

1

12

8 (67%)

가 T2

. AlKawi (3)

가 가

가

(16/17),

가

35%

가

(2).

7

9

(2 )

. Tali (4)

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T2

39

13

5

가

가

가

(9)가

가

가

17

3

(4)

가

3

(7).

(4, 7, 14)

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## MR Findings of Neuro-Behçet's Disease: Initial and Follow-up Changes<sup>1</sup>

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**Purpose:** To evaluate the MR findings of neuro-Behçet's disease, and changes occurring during follow up.

**Materials and Methods:** Brain MR imaging was performed in 19 patients in whom neuro-Behçet's disease had been clinically diagnosed. After treatment with corticosteroids and immunosuppressive agents, 23 follow-up MR images were obtained in 12 patients, and a total of 42 MR images were retrospectively reviewed by two radiologists.

**Results:** Of the 19 patients, 17 (89%) had parenchymal lesions, and the other two had dural venous sinus thrombosis. Among the 17 patients with parenchymal lesions, three showed leptomeningeal enhancement. A total of 72 parenchymal lesions were detected on initial MR images; 55 (76%) were patchy or nodular in shape and the lesion of the internal capsule appeared linear. Seventeen lesions (24%) in 12 patients were confluent. In order of frequency, the involved sites were the pons, midbrain, thalamus, basal ganglia, internal capsule, and frontal lobe. Thirteen lesions of 39 lesions detected on postcontrast images were enhanced, and a mass effect was seen in the area of 16 parenchymal lesions. Associated findings were microhemorrhage of the brain in two patients and spinal cord involvement in one. On short-term follow-up images obtained 1 week to 2 months after intensive treatment during the acute stage of the illness, the leptomeningeal enhancement seen in three patients had decreased and most parenchymal lesions showed improvement. Long-term follow-up images obtained 3 months to 3 years later showed that parenchymal lesions had relapsed in five patients, and brainstem atrophy had developed or progressed in five others.

**Conclusion:** The most characteristic MR finding of neuro-Behçet's disease is multiple non-hemorrhagic lesions involving the brainstem. Leptomeningeal enhancement and dural venous sinus thrombosis may also be noted. On follow-up MR, the lesions may show either improvement or aggravation, and brainstem atrophy is not uncommon.

**Index words :** Brain, MR  
Vasculitis  
Behçet disease

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