



(80%)

**대상 및 방법**

1995 1 1999 3 4 3  
 6 CT  
 MRI 22  
 CT MRI  
 6 Glasgow outcome  
 scale Fisher's exact test

**결 과**

**1. 성별 및 연령분포**

22 17 5  
 5 64 15 8

**2. MRI상 병소의 분포**

MRI 9 22  
 MRI  
 74 25 (33%), 26  
 (35%), 10 (14%), 13 (18%)  
 가 10  
 (40%), 11 (44%), 4 (16%)가  
 (splenium)가 10  
 (38%), (body)가 12 (46%), (genu)가 4  
 (15%) 10  
 (unilateral) (midbrain)가  
 7 (70%), (pons)가 2 (20%) (medulla)  
 가 (Table 1).

(Brainstem Injury) (teg-  
 mentum)가 3, (crura cerebri)가 2, -  
 (combined)가 2  
 (dorsal) - (combined)  
 1 (Table 2).

14 8 (57%)

**Table 1.** Distribution of lesion on brain MRI

Lesion location	No. of lesion
White matter of cerebral hemisphere	25(33%)
Frontal	10
Temporal	11
Parietal	4
Occipital	-
Corpus callosum	26(35%)
Rostrum	-
Genu	4
Ant. body	3
Post. body	9
Splenium	10
Brainstem	10(14%)
Midbrain	7
Pons	2
Midbrain/pons	1
Basal ganglia	13(18%)
Total	74(100%)

**Table 2.** Location of traumatic lesions of brainstem

Lesion location	No. of lesion
Midbrain	-
Tectum	3
Tegmentum	2
Crura cerebri	2
Tegmentum/cruracerebri	-
Pons	-
Dorsal(pontine tegmentum)	2
Ventral(pons proper)	-
Midbrain/Pons(combined)	1
Total	10

**Table 3.** Outcome according to the location of brainstem injuries

Location	GR/MD*	SD/PV*	D*	Total
Midbrain Tectum	-	-	-	-
Tegmentum	1	2	-	3
Crura cerebri	2	-	-	2
Tegmentum/crura cerebri	-	2	-	2
Pons Dorsal	-	2	-	2
Ventral	-	-	-	-
Midbrain/Pons(combined)	-	1	-	1
Total	3	7	-	10

\* : GR : good recovery MD : moderate disability  
 SD : severe disability PV : persistently vegetative  
 D : death

**Table 4.** Association of brain stem injury to outcome

Brainstem injury	GR/MD*	SD/PV*	D*	Total
+	3	7	-	10
-	11	1	-	12

(p=0.204).

**3. 뇌간손상과 예후**

6 Glasgow outcome scale (good recovery/moderate disability)  
 8 (severe disability/persistently vegetative)

2  
 2  
 1 (Table 3).  
 1cm 1cm

10 가 가 1cm  
 2

10  
 12  
 10 7  
 12 (Table 4)  
 (p=0.006).

**고 찰**

가 (rotational acceleration) (shearing) (ten- sile strains)  
 CT 가 (shearing force)  
 axonal swellings axonal retraction balls (11)(14)(24). Cajal

(stretched) (myelin sheath) axonal retraction balls

1943 Holburn (shear strain) 가 (gray/white matter interface), (skull/brain interface), (dura matter/brain interface) 가 (white matter of cerebral hemisphere), (corpus callosum), (dorsolateral rostral brainstem) 80% (5)(8).

가 CT MRI

가 가 Adams Gennarelli 가 (5).

10 MRI가 CT (8)(9)(19)(23), (MRI가 MRI가 Gentry (8)(12)(13)(21)(25). 1988 MRI가 CT (8) 1980 MRI (8-10)(20).

MRI 14 26(35%)

Lindenberg (16) Clarke (4) 가 가 (lateral) (oblique lateral) 가

가 가

가  
 (15%) 가  
 (combined) 1

5)15)17)18)

12

8

3

- : 2000 2 1
- : 2000 3 27
- :

301 - 070

10 - 7

: 042) 220 - 8854, : 042) 222 - 7573

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### References

Adams

가  
 (marker)가  
 10 8 (80%)

1995 1 1999 3  
 가  
 22

1) MRI

2)

3)

4)

5) 22 10

8

6)

(p=0.006).

MRI

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