

가 20
MRI
가 12, 8
56.8 (16-67), 10, 10
가 14, 가 1,
가 5

MRI
1 9, 2 3, 5 1, 7 1,
9 1, 18 1, 1 2, 2 1
8 1

MRI 36
50 (32, 18

1.0 T (Vistar, Picker)
T1 (TR/TE: 500~600/20),
1.5 mm 2.5 mm,
3 mm 5 mm 18 Gadolini-
um-DTPA (Magnevist, Shering, Germany) 0.1 mmol/kg
T1
(FOV) 110 mm, 192 x 256
Mark (3)

(buckling)
(Fig. 1).

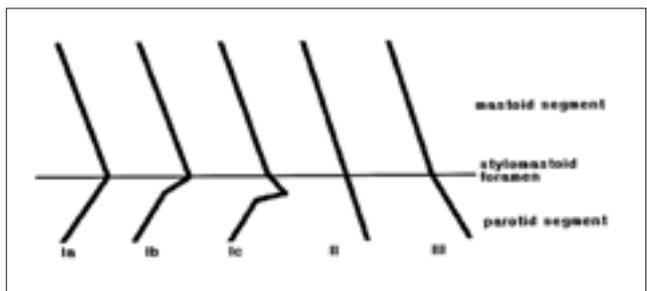


Fig. 1. Course of facial nerve from distal tympanic segment to proximal parotid segment. I : anterior angulation, I-a : obtuse , I-b : acute, I-c : buckling, II : straight, III : posterior angulation.

MRI
가 2 가
1 가 가
가
MRI
가
가 (absent), (mild),
(fair), (marked)

MR
24 (48%) ,
23 (46%) , 3 (6%)
(Fig. 2).
34 (68%)
가 15 (30%) , 1
(2%) . 16
8 (50%)
1.38 ± 0.27 mm
(p = 0.091).
SSPS for windows (SSPS Inc., U.S.A.) paired
sampled T - test
0.15 ± 0.12 mm 가
1 (6.25%)
18 12 (66.6%)
(mild) 12
11
(Table 1).

MR
가 14 ,
가 5 , 1
8 가 14 , 8
가 6
가 11 (55%)
(buckling) 7 , 2 , 2
8 (40%)
1 (5%) 1
3
(Fig. 3).
가 가 16 (80%)
가 4 (20%)
9 (45%) ,

Table 1. Summary of MRI Findings in Facial Nerve Paralysis

Case No/ sex/age	Dx	Time interval from onset to MRI	Course	Atrophy	Site of facial nerve enhancement							
					Unaffected Side				Affected Side			
					G	T	M	P	G	T	M	P
1/F/48	B	1week	obtuse	-		+	+	-		++	++	+
2/M/16	B	1week	obtuse	-		+	+	-		+	+	+
3/M/47	B	1week	obtuse	-		+	+	-		+	+	+
4/F/59	B	1week	obtuse	-		+	+	-		++	++	+
5/F/66	B	1week	straight	-		+	+	-	++	++	+	-
6/F/59	B	1week	straight	-		+	+	-		+	+	+
7/M/41	PT	1week	straight	-		-	-	-		++	++	-
8/F/33	PT	1week	obtuse	-		+	-	-		++	++	+
9/M/47	PT	1week	buckling*	-		+	+	-		++	+	+
10/M/64	B	2weeks	obtuse	-		+	+	-		++	++	+
11/M/37	PT	2weeks	buckling	-		-	-	-		+++	++	+
12/M/64	B	2weeks	posterior	-		+	+	-	++	++	++	+
13/M/67	B	5weeks	straight	-		-	-	-		++	++	++
14/F/59	B	7weeks	obtuse	-		+	+	-	++	++	+	+
15/M/57	B	9weeks	straight	+		-	-	-	++	++	++	+
16/M/23	PT	18weeks	buckling	+								
17/M/59	B	1year	obtuse	-								
18/M/59	B	1year	obtuse	-		+	+	-		++	+	+
19/F/54	B	2years	straight	+		-	-	-		-	-	-
20/M/54	H	8years	straight	+		-	-	-		-	-	-

Dx : diagnosis, B : Bell 's palsy, PT : post-traumatic or post-operative facial nerve palsy, H : Herpes Zoster oticus facial neuritis, G : geniculate ganglion, T : tympanic segment, M : mastoid segment, P : proximal parotid segment, - : absent, + : mild, ++ : fair, +++ : marked enhancement.

buckling*: buckling of proximal mastoid segment of facial nerve

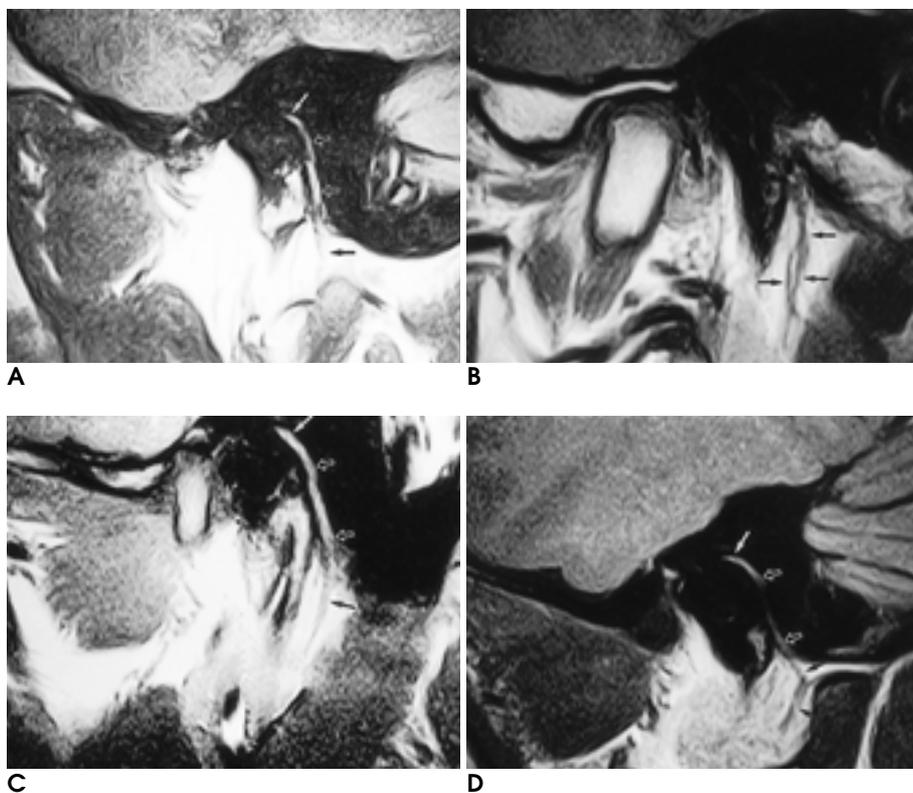


Fig. 2. Course of normal facial nerve from tympanic segment (white arrow) to mastoid segment (open arrows) to parotid segment (black arrow). Oblique sagittal T1WI using TMJ surface coil. **A, B.** Straight type. Oblique sagittal T1WI (B) shows branches of parotid portion (arrows) of facial nerve. **C.** Anterior angulation type. **D.** Posterior angulation type.

MRI

가 . 4 (20%) .

가 가 6 MRI

가 . 4 8 (3 mm)

MRI (Fig. 4).

18 가

14 (100%) MRI

(78%) 11 가

12 (85.7%) . Mark (3) MRI

(Fig. 5). 4

2 (50%) . Daniels

2 8 MRI (Fig. 6). (4)

MRI (Table 1).

MRI (5 - 7).

MRI Gd - DTPA

MRI Gd - DTPA

MRI

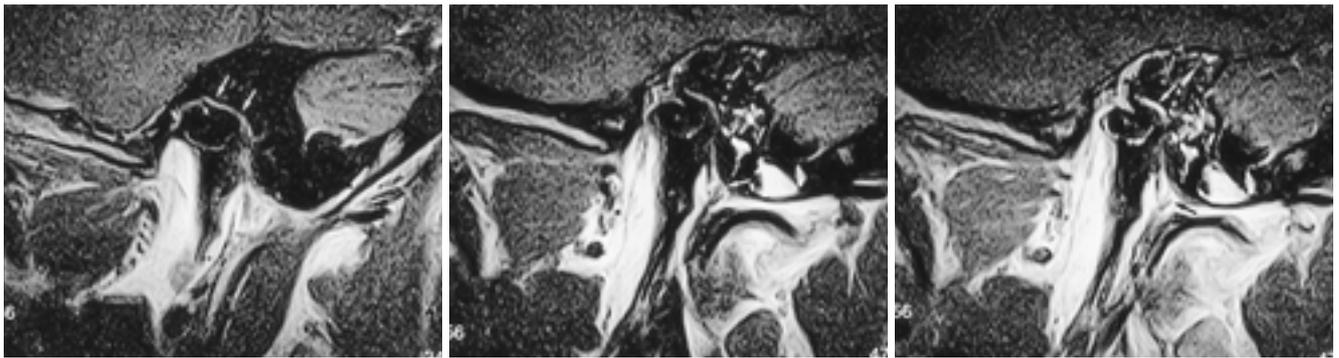


Fig. 3. 37-year-old man with posttraumatic Rt. facial palsy resulting from ipsilateral temporal bone fracture. MR images were obtained 2 weeks after onset of symptoms.

A. Opposite, normal facial nerve. Oblique sagittal Gd-enhanced T1WI shows mild enhancement of tympanic segment (arrows) of the Lt. facial nerve.

B, C. Affected side facial nerve. Oblique sagittal T1WI, before (B) and after (C) administration of contrast material. Precontrast view shows buckling of the parotid segment (arrow) of the Rt. facial nerve. After contrast administration, there is marked enhancement of the tympanic segment (white arrow) of the Rt. facial nerve, compared with the opposite, normal side (A). Also, the parotid segment (black arrow) shows mild enhancement.

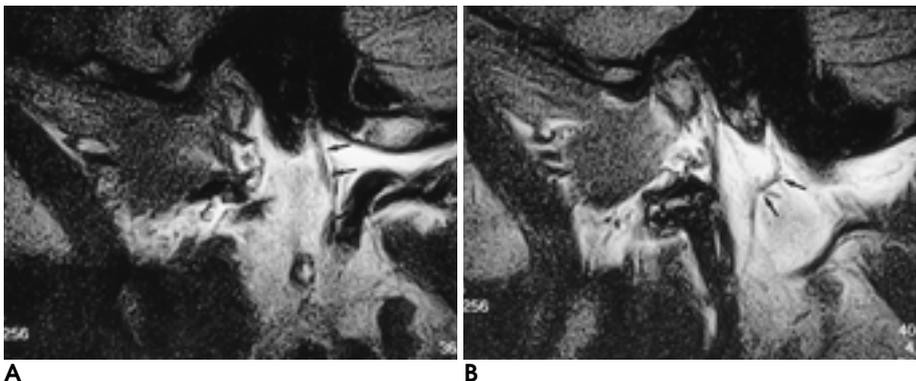


Fig. 4. 23-year-old man with post-traumatic the Lt. facial palsy. MR images were obtained 18 weeks after onset of symptoms. Oblique sagittal T1WI without contrast administration.

A. Normal side facial nerve. The mastoid segment (arrows) of facial nerve shows course of straight type.

B. Affected side. The mastoid segment (arrows) of facial nerve shows buckling and atrophy compared with normal side (A).

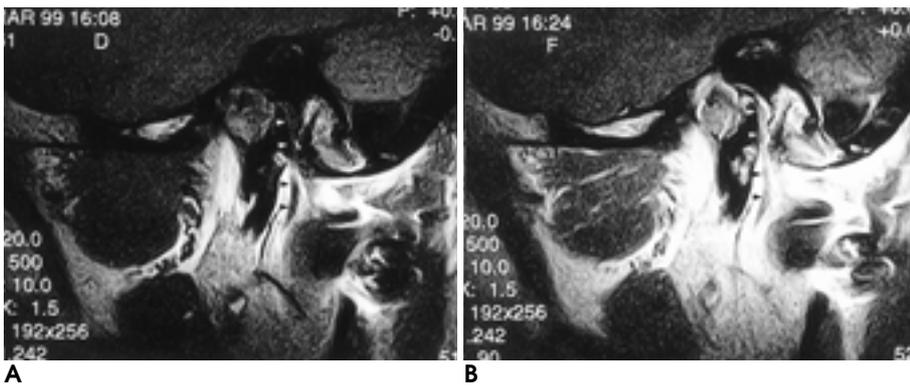


Fig. 5. 33-year-old woman with post-traumatic the Rt. facial palsy. MR images were obtained 1 week after onset of symptoms.

A, B. Oblique sagittal T1WI, before (A) and after (B) administration of contrast material, through the mastoid and parotid segments of the Rt. facial nerve. On precontrast view, the mastoid (white arrowheads) and parotid (black arrowheads) segments of facial nerve show iso- or hypointense to brain parenchyma. After contrast administration,

the mastoid and parotid segments of the Rt. facial nerve show mild to fair enhancement.

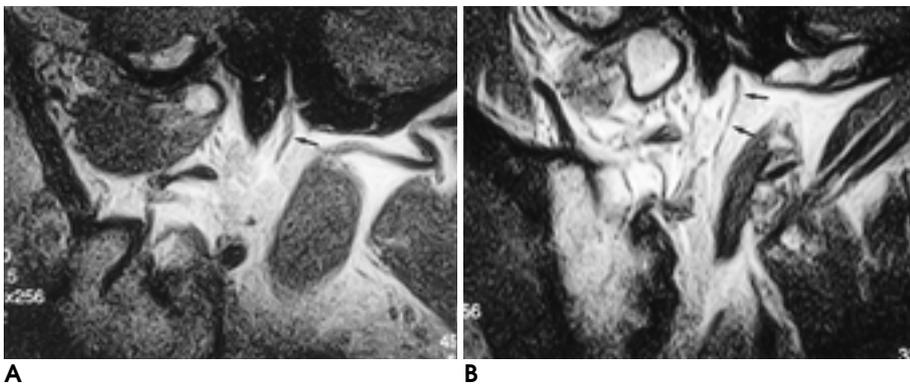


Fig. 6. 64-year-old man with chronic Bell's palsy. MR images were obtained 2 years after onset of symptoms.

A, B. Oblique sagittal Gd-enhanced T1WI show no definite enhancement of normal (A) and opposite, affected facial nerve (B). Affected facial nerve appears to be thin compared with normal side.

Study	Method	Number of Cases	Percentage	Findings
Tien (13)	MRI T1 & T2	2	14.2%	(48%)
	MRI T1	3	60%	(46%)
Gebarski (14)	Gd-DTPA	18	66.6%	(16)
	MRI	12	85.7%	(11)
Gibson (15)	MRI T1	11	73.3%	(10-12)
	MRI T1 & T2	4	26.7%	(15)
Gibson (15)	MRI T1	11	73.3%	(10-12)
	MRI T1 & T2	4	26.7%	(15)
Gibson (15)	MRI T1	11	73.3%	(10-12)
	MRI T1 & T2	4	26.7%	(15)

가

(13, 17, 18).

8 6

(17). 가

(1).

MRI

. Martin (19)

VIII

(buckling),

가

MRI

(20 - 23).

MRI

14

(localization)

12 (85.7%)

, 11 (78.5%)

(fair)

Martin

3

. 8

6

4

2

가 , 2

Gd - DTPA

MRI가

가 4 (66.6%)

(22, 23).

Engstrom (24)

가

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MR Findings of Facial Nerve on Oblique Sagittal MRI Using TMJ Surface Coil: Normal vs Peripheral Facial Nerve Palsy¹

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Purpose: To evaluate the findings of normal facial nerve, as seen on oblique sagittal MRI using a TMJ (temporomandibular joint) surface coil, and then to evaluate abnormal findings of peripheral facial nerve palsy.

Materials and Methods: We retrospectively reviewed the MR findings of 20 patients with peripheral facial palsy and 50 normal facial nerves of 36 patients without facial palsy. All underwent oblique sagittal MRI using a TMJ surface coil. We analyzed the course, signal intensity, thickness, location, and degree of enhancement of the facial nerve. According to the angle made by the proximal parotid segment on the axis of the mastoid segment, course was classified as anterior angulation (obtuse and acute, or buckling), straight and posterior angulation.

Results: Among 50 normal facial nerves, 24 (48%) were straight, and 23 (46%) demonstrated anterior angulation; 34 (68%) showed iso signal intensity on T1WI. In the group of patients, course on the affected side was either straight (40%) or showed anterior angulation (55%), and signal intensity in 80% of cases was isointense. These findings were similar to those in the normal group, but in patients with post-traumatic or post-operative facial palsy, buckling, of course, appeared. In 12 of 18 facial palsy cases (66.6%) in which contrast materials were administered, a normal facial nerve of the opposite facial canal showed mild enhancement on more than one segment, but on the affected side the facial nerve showed diffuse enhancement in all 14 patients with acute facial palsy. Eleven of these (79%) showed fair or marked enhancement on more than one segment, and in 12 (86%), mild enhancement of the proximal parotid segment was noted. Four of six chronic facial palsy cases (66.6%) showed atrophy of the facial nerve.

Conclusion: When oblique sagittal MR images are obtained using a TMJ surface coil, enhancement of the proximal parotid segment of the facial nerve and fair or marked enhancement of at least one segment within the facial canal always suggests pathology of the facial nerve. The use of this modality, together with the coil, is, therefore, an effective complementary technique for the evaluation of a facial nerve.

Index words : Nerves, facial
Nerves, MR
Magnetic resonance (MR), coils

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