

CT, MR

1

: HP

가 .

HP CT, MR
 HP
 CT(n=6) (n=10) HP 18 MR(n=16),
 (n=1) HP 14 (n=8), (n=3), (n=1), (n=1),
 (n=1) HP 4 (n=2), (n=1),
 (n=7) . MR T2 가 5.4cm (n=8)
 T2 13 3
 9
 2 6 CT
 5 5
 (n=8), radiculomedullary a.(n=1) (n=1)

: HP

T2

(Hemangiopericytoma: HP)

HP 18 (MR), (CT),

가
 (pericyte)

(1,2).

1989 1998 4
 HP 18 6

Dufresne (3)

CT 10 , 2 16 MR CT

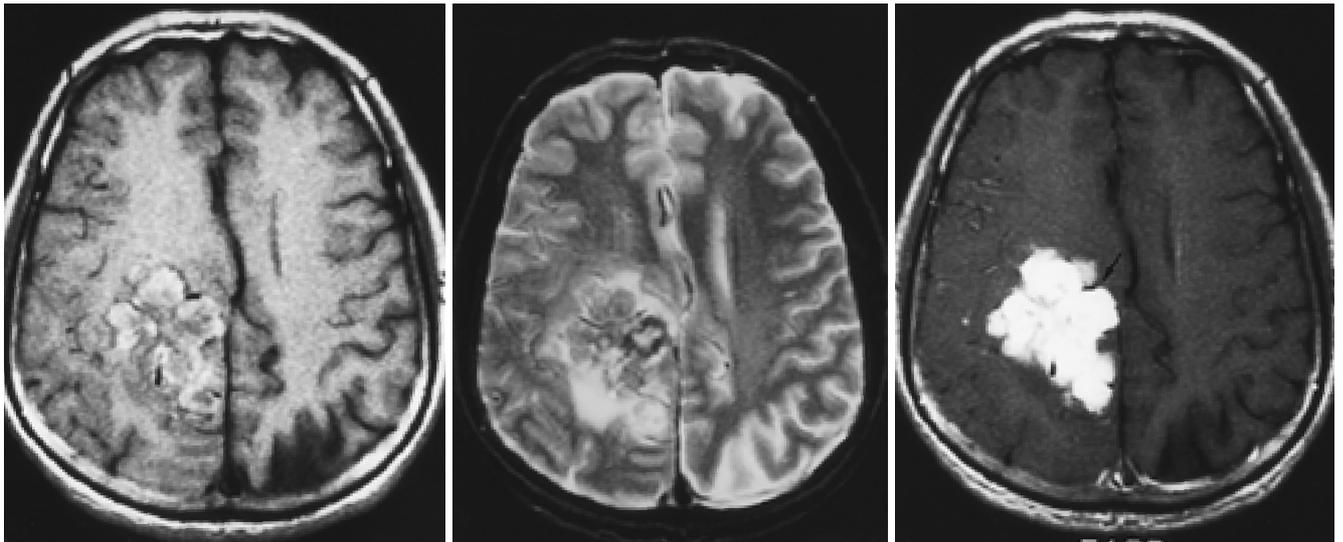
가 HP CT HP

Somatom plus (Siemens, Erlangen, Germany) GE 9800 (GE medical system, Milwaukee, U.S.A.)

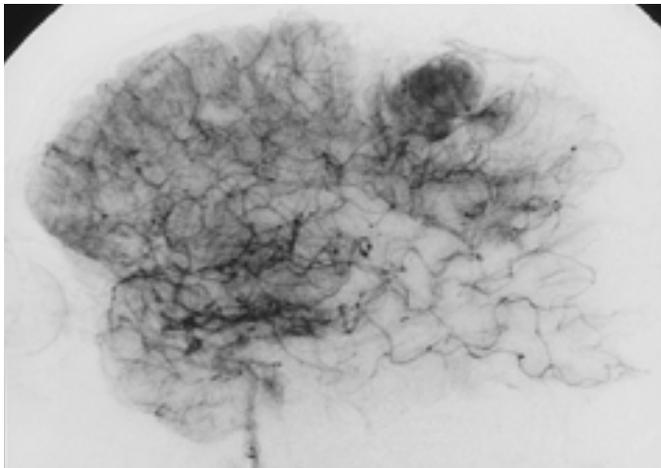
100X(Shimadzu, Kyoto, Japan) 1.5T GE Signa(GE medical system, Milwaukee, U.S.A.), 1.5T Magnetom Vision(Siemens, Erlangen, Germany)
 T1 (TR/TE 600-740/14-20msec), T2 (TR/TE 2500-5400/90-108msec)
 Gd-DTPA(Magnevist, Schering, Berlin, Germany) 0.1mmol/Kg

(++), 10 (+++)
 Integris BN 3000 Integris C 2000(Philips, Amsterdam, Netherland)
 Ultravist 300(Schering AG, Berlin, Germany) 8
 1
 18 45 (17-60) 가
 12 (67%), 가 6 (33%)
 (parasagittal) 8 (convexity)
 가 3 , 2 ,
 (olfactory groove)가 1
 HP 18 14
 5.4cm 8 , 7 ,
 3 T2 가
 13 (72%) 13 9
 (69%) (Fig. 2B) , T2 3

1
 , , ,
 , , ,
 (ovoid), (lobulated), (papillary)
 가
 5 (+), 5 10



A B C



D

Fig. 1. 58-year-old man with meningeal hemangiopericytoma (patient 13)
 Axial T1(A), T2(B), Gd-enhanced T1(C)-weighted images show extraaxial parasagittal mass with irregular papillary contour (arrow), several vascular signal voids and intense enhancement. Lateral view of right internal carotid angiogram, capillary phase(D) shows hypervascular mass supplying from anterior cerebral artery without early draining veins.

Table 1. Summary of MR, CT, and Angiographic Findings in 18 Patients with Hemangiopericytomas

No. of Pt.	Age/ Sex	Type/ Location	Modality	Heterog HSI on T2WI	Signal Void	Bony destruction	Feeders on Angio
1	53/F	M(Conv)	MR	-	++	+	
2	37/M	M(PS)	MR	+	+	-	
3	60/M	Masticator space	MR, CT, Angio	+	++	+	ECA
4	47/M	M(PS)	CT			-	
5	29/M	M(PS)	MR	-	+	-	
6	56/F	M(PS)	MR, Angio	+	++	+	ICA & ECA
7	45/M	M(choroid plexus)	MR, CT	-	+	-	
8	37/M	M(olfactory groove)	MR, Angio	-	+++	+	ICA & ECA
9	53/M	Supraclavicular	MR, Angio	-	+	-	Descending scapular
10	17/F	M(ID, T1)	MR, Angio	-	+	-	Radiculomedullary
11	55/M	M(PS)	MR, Angio	+	+	erosion	ECA
12	58/M	M(PS)	MR, CT, Angio	+	+	-	ICA & ECA
13	50/M	Post neck(C5-T1)	MR, CT	-	+++	-	
14	56/M	M(PS)	MR	+	++	-	
15	34/M	M(Conv)	MR, CT, Angio	-	+++	+	ICA & ECA
16	44/F	Masticator space	CT, Angio			-	ECA
17	32/F	M(PS)	MR	+	++	-	
18	44/M	M(Conv)	MR, Angio	+	+++	+	ICA & ECA

M: meningeal hemangiopericytomas, Conv: convexity, PS: parasagittal, ID: intradural, Heterog: heterogeneous, HSI: high signal intensity, ICA: internal carotid artery, ECA: external carotid artery, Angio: angiography, + : below five signal voids, ++ : more than five and below ten signal voids, +++: more than ten signal voids

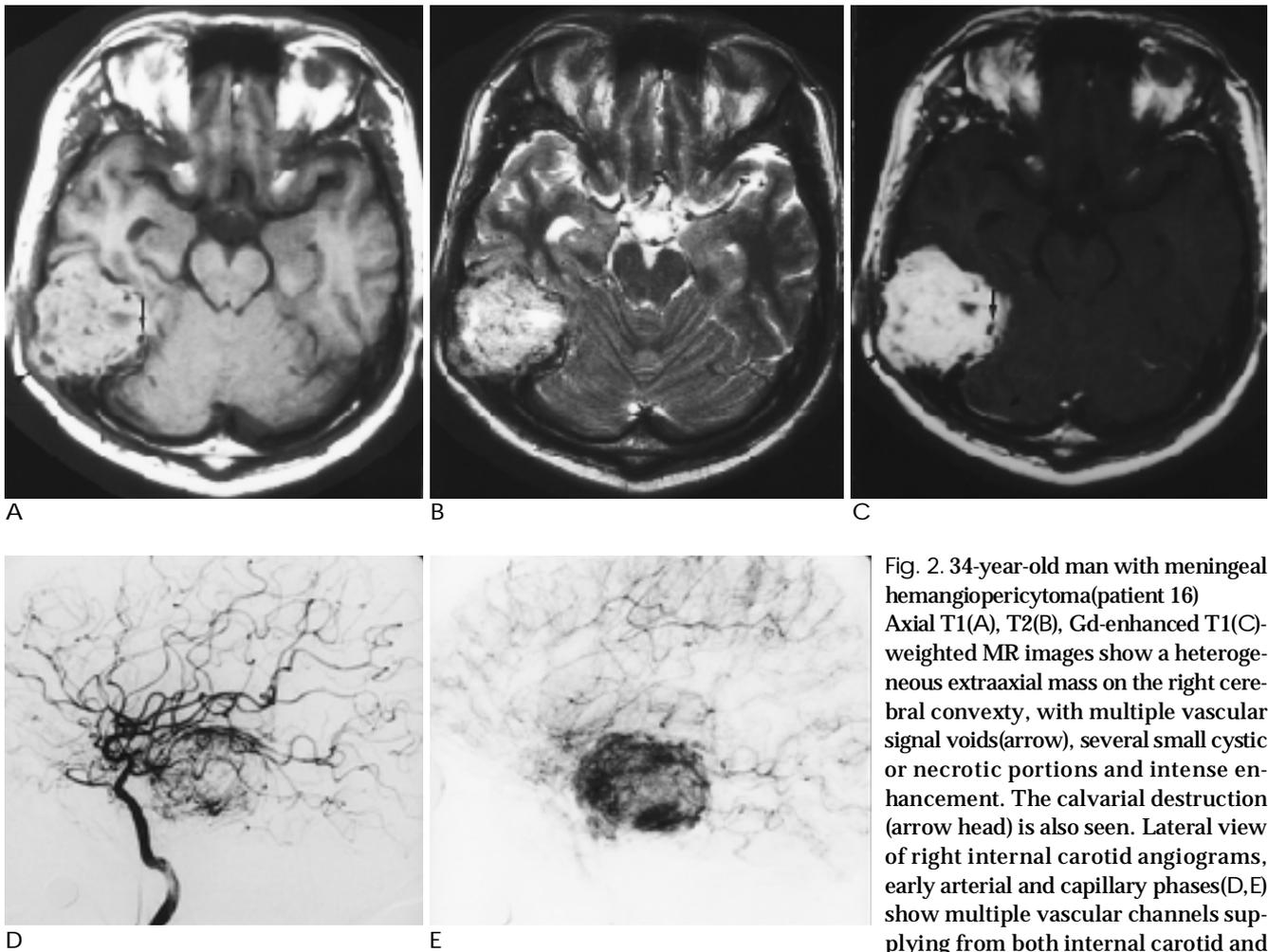


Fig. 2. 34-year-old man with meningeal hemangiopericytoma(patient 16) Axial T1(A), T2(B), Gd-enhanced T1(C)-weighted MR images show a heterogeneous extraaxial mass on the right cerebral convexity, with multiple vascular signal voids(arrow), several small cystic or necrotic portions and intense enhancement. The calvarial destruction (arrow head) is also seen. Lateral view of right internal carotid angiograms, early arterial and capillary phases(D,E) show multiple vascular channels supplying from both internal carotid and posterior cerebral arteries which have centripetal pattern of tumor staining without early draining veins or arteriovenous shunt.

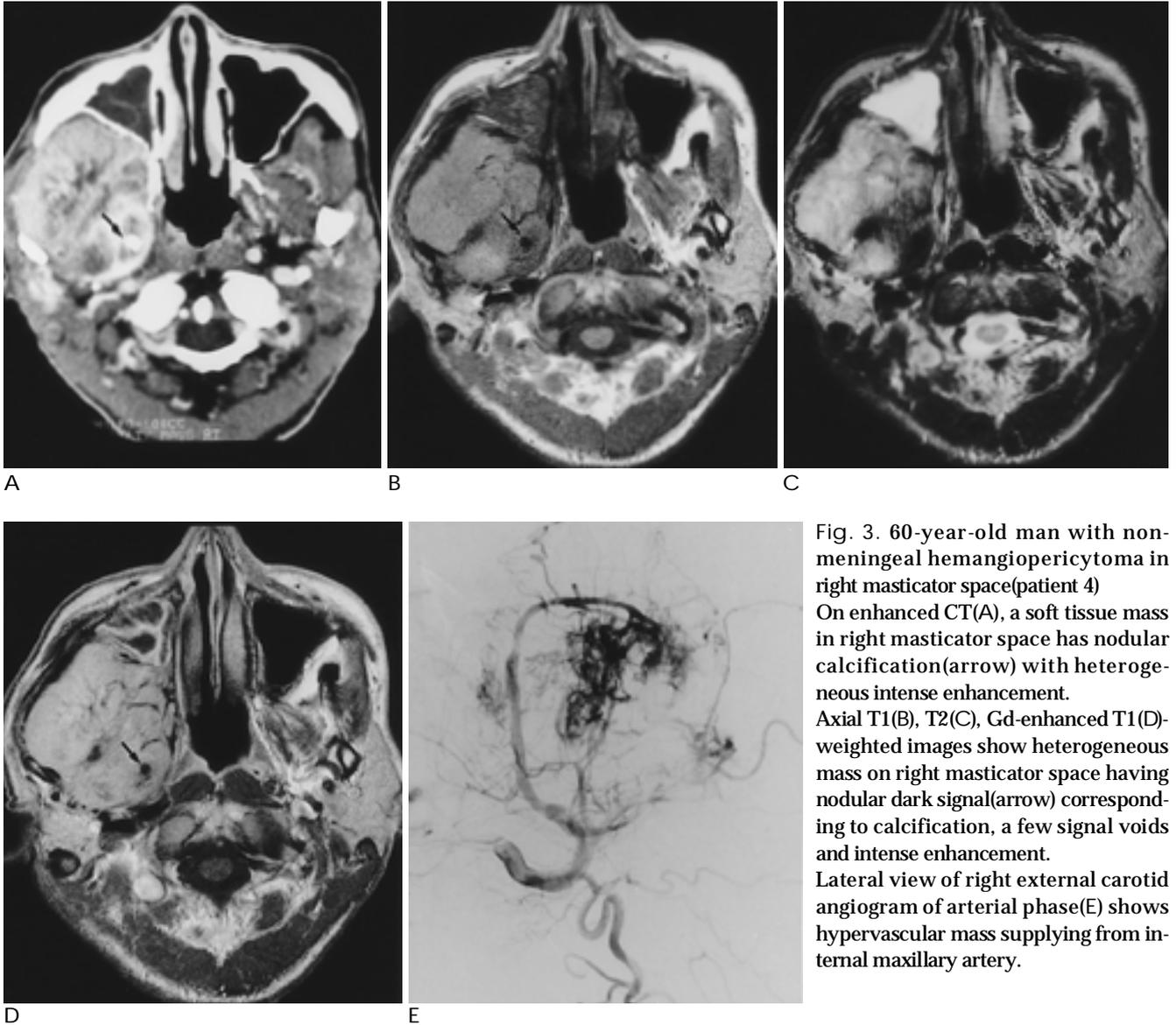
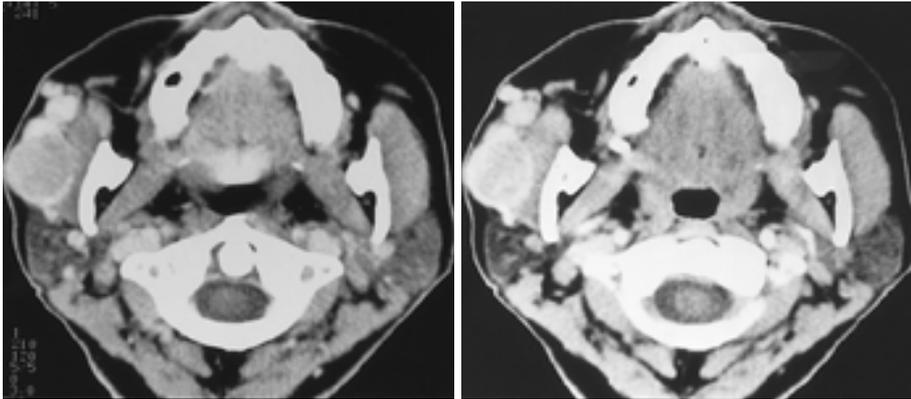


Fig. 3. 60-year-old man with non-meningeal hemangiopericytoma in right masticator space(patient 4)
 On enhanced CT(A), a soft tissue mass in right masticator space has nodular calcification(arrow) with heterogeneous intense enhancement.
 Axial T1(B), T2(C), Gd-enhanced T1(D)-weighted images show heterogeneous mass on right masticator space having nodular dark signal(arrow) corresponding to calcification, a few signal voids and intense enhancement.
 Lateral view of right external carotid angiogram of arterial phase(E) shows hypervascular mass supplying from internal maxillary artery.

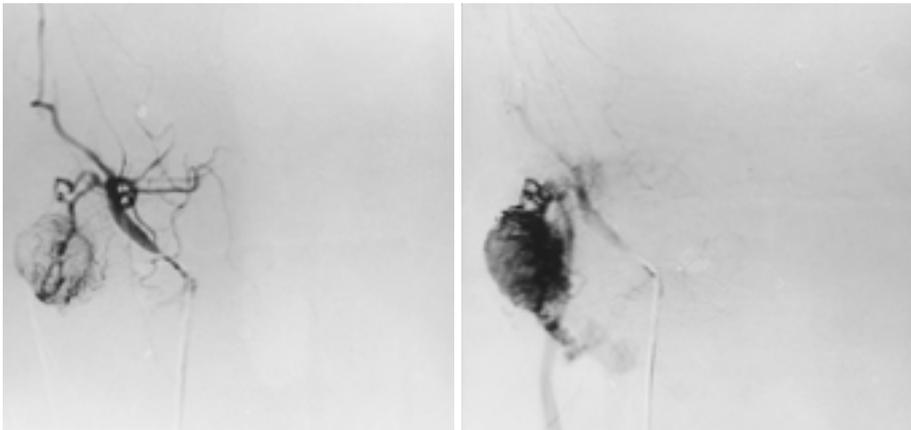
(17%)
 가 3 . 가 T2 1 가 3 4 가 6
 . MR
 9 (60%) 6 (40%)
 5 (+) 가 7 , 5 10
 (++) 가 5 , 4 10
 (+++) (Fig. 2)
 가
 1 T2 (tumor staining) (Fig. 2D,E)
 가 HP 2 HP (centripetal pattern) CT (Fig. 5).
 CT 6 (Fig. 3)
 8 5
 가 6
 (33%)(Fig. 2) 1 (6%)



A

B

Fig. 4. 44-year-old woman with non-meningeal hemangiopericytoma in right masseter muscle(patient 17)
On early arterial(A) & delayed phase(B) dynamic spiral CT, a mass adjacent to right masseter muscle shows centripetal pattern of tumor enhancement, which enhances from peripheral to center and right internal maxillary arteriograms(C, D) approved that.



C

D

HP (extraaxial tumor) (6)
Pitkethly (14)
1954 Begg (4)
1996 WHO(World Health Organization)
HP (5)
HP가 HP
가 HP
HP 13 85%
Chiechi (5) HP MR T1 T2
(dural tail sign)
가
13 HP 6 가
가 (6). 5, 10, 15 3 3
67%, 40%, 23% (6).
HP 50 (2) Guthrie (6) 가 HP MR
(7-11) 38 42 3 T1 T2 44 HP MR
Cosentino (18) HP
T1 T2
(6,7-17) 가 67% T2

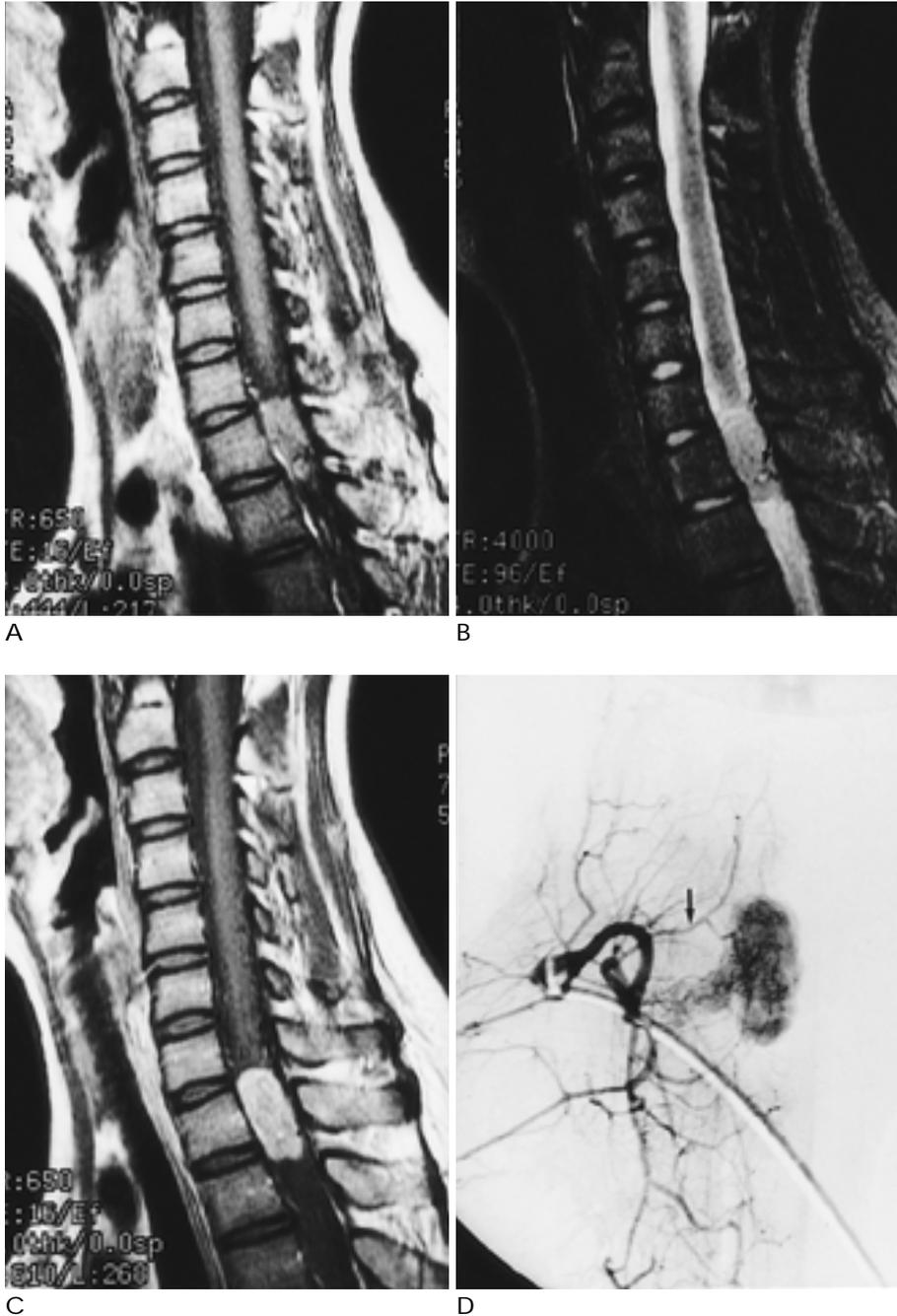


Fig. 5. 17-year-old woman with meningeal hemangiopericytoma in intradural and extramedullary space at the level of first thoracic vertebra(patient 17)
T1(A), T2(B), Gd-enhanced T1(C)-weighted images show a intradural extramedullary mass at the level of one thoracic vertebra, which has several vascular signal voids(arrow) and intense enhancement. The angiogram(D) shows intense tumor staining from right radiculomedullary artery(arrow) without early venous drainage.

가 76% 가 3 HP 1 가
 12 HP
 (4) 6 , 1
 CT 6 2
 가 Mayo Clinic(19) 53 가 (20)
 HP 9% 가 4.95 cm
 가 HP 8
 CT 2 (44%), 7 (39%) (20)

12 (39%), 1 (3%)
 T2 31 9 (29%)
 가 HP
 가 Dufresne (3) HP
 가 HP 38%, 8%
 가 HP 75% 25%
 가 3 HP
 가 HP HP
 (21). HP 15-20%
 HP (22)
 가
 1 1 radicu-
 lomedullary artery 가
 Marc (23) HP
 HP CT
 HP HP
 MR T2
 가
 가
 HP

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CT, MR and Angiographic Findings of Hemangiopericytomas¹

Soo Mee Lim, M.D., Ho Kyu Lee, M.D., Ji Hoon Shin, M.D., Jae Kyun Kim, M.D.,
Dae Hong Kim, M.D., Choong Gon Choi, M.D., Dae Chul Suh, M.D.

¹Department of Diagnostic Radiology, Asan Medical Center, College of Medicine, University of Ulsan

Purpose: Hemangiopericytoma(HP) exhibits its pathologic findings different from those of meningioma or other angiomatous tumor; and its clinical behavior is unique and prognosis worse than other cases. We reviewed the CT, MR and angiographic findings of HPs and evaluated differential radiologic points of comparison between typical meningiomas and meningeal HPs.

Materials and Methods: MR(n= 16), CT(n= 5) and angiographic imaging(n= 10) were performed in 18 patients(M:F= 12:6, mean age:45 years) with histologically proven primary HPs. We evaluated the imaging findings of HPs with respect to site, shape, size, signal intensity, enhancement characteristics, vascular signal voids, calcification, bony and adjacent sinus involvement, and angiographic findings.

Results: HPs were meningeal in 14 cases and nonmeningeal in four. Meningeal HPs were located in the parasagittal region(n= 8), convexity(n= 3), intradural extramedullary space(n= 1), choroid plexus(n= 1), and olfactory groove(n= 1). Nonmeningeal HPs were located in the masticator space(n= 2), paraspinal area(n= 1) and supraclavicular area(n= 1). The mean maximal dimension of tumors was about 5.4cm and their shape was papillary(n= 8) or lobulated(n= 7). MR images showed high(n= 13) or iso(n= 3) signal intensities on T2WI, and heterogeneity on T2WI(n= 9). Vascular signal voids in the mass were seen in all cases, while in two cases, CT scanning showed nodular dense calcification. Bone destruction was present in six cases, but no hyperostosis was found. In five cases, the superior sagittal sinus was involved. Angiographic images revealed highly vascular masses supplied by the internal carotid artery(n= 5), external carotid artery(n= 8), descending scapular artery(n= 1) and radiculomedullary artery(n= 1), with delayed tumor blush during the capillary and venous phase in which there was no arteriovenous shunt.

Conclusion : HP is one of the extra-axial tumors in which there is hypervascularity, aggressive bony destruction arising in the meningeal and extrameningeal area, and heterogeneous high signal intensity, as seen on T2WI. Calcification is rare.

Index words : Hemangiopericytoma

Angioma, central nervous system

Brain neoplasms, CT

Brain neoplasms, MR

Address reprint requests to : Ho Kyu Lee, M.D., Department of Diagnostic Radiology, Asan Medical Center,
University of Ulsan College of Medicine #388-1 Poongnap-Dong, Songpa-Ku, Seoul 138-040, Korea.
Tel. 82-2-2224-4400 Fax. 82-2-476-4719