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 (CT) MR 12 13
 (MR) 가 3 , 21 65
 가 가 42 . 6 4 2
 CT MR ton's criteria (가 , 3 · 4 · 5 · 6)
 1999 11 9 2000 7 5
 3 가 , MR

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(5).

MR 1.5 Tesla Magnetom Vision (Siemens, Erlangen, Germany) 1.0 Tesla Shimadzu 100X/XP (Shimadzu, Kyoto, Japan) T1 (TR/TE, 500/20 msec) T2 (TR/TE, 4000/80 msec)

1 kg 0.1 mmol Gadolinium - DTPA (Magnevist, Schering, Germany) T1

4 mm 1 cm, 1 mm, 256 × 256 2 (1)가 MR

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(Table 2).

(Fig. 1A),

(Fig. 2A).

(Fig. 1B, 2B).

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(Table 1).

가,

(Fig. 3), 5

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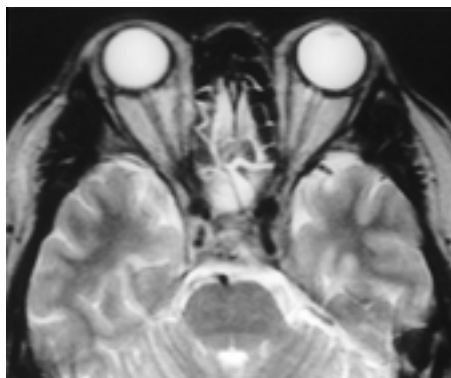
(Fig. 2C),

Table 1. Clinical Manifestations in Septic Cavernous Sinus Thrombosis

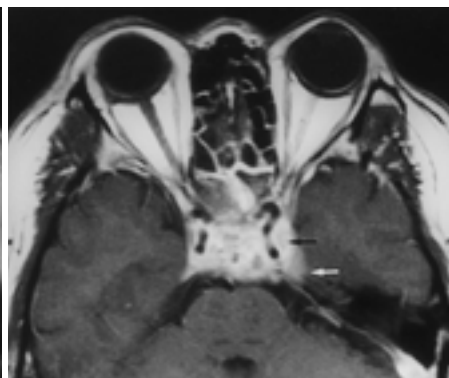
Clinical Manifestations	Case 1 (42/M)	Case 2 (35/M)	Case 3 (21/M)	Case 4 (64/F)	Case 5 (65/F)	Case 6 (26/F)
Systemic signs						
Fever	+	+	+	+	+	+
Leucocytosis	+	+	+	+	+	+
Cranial nerve deficit						
V ₁ /V ₂	+	+	+	+	+	+
III/IV/VI	+	+	-	+	-	+
Ophthalmic signs						
Chemosis	-	+	+	+	+	+
Eyelid edema	-	+	+	+	+	+
Proptosis	-	-	+	+	-	+
Meningismus	+	+	+	-	+	-
Follow up	Improve	Improve	Improve	Improve	Expire	Expire

V₁/V₂ : ophthalmic/maxillary branches of trigeminal nerve

III/IV/VI : oculomotor/trochlear/abducent nerves



A



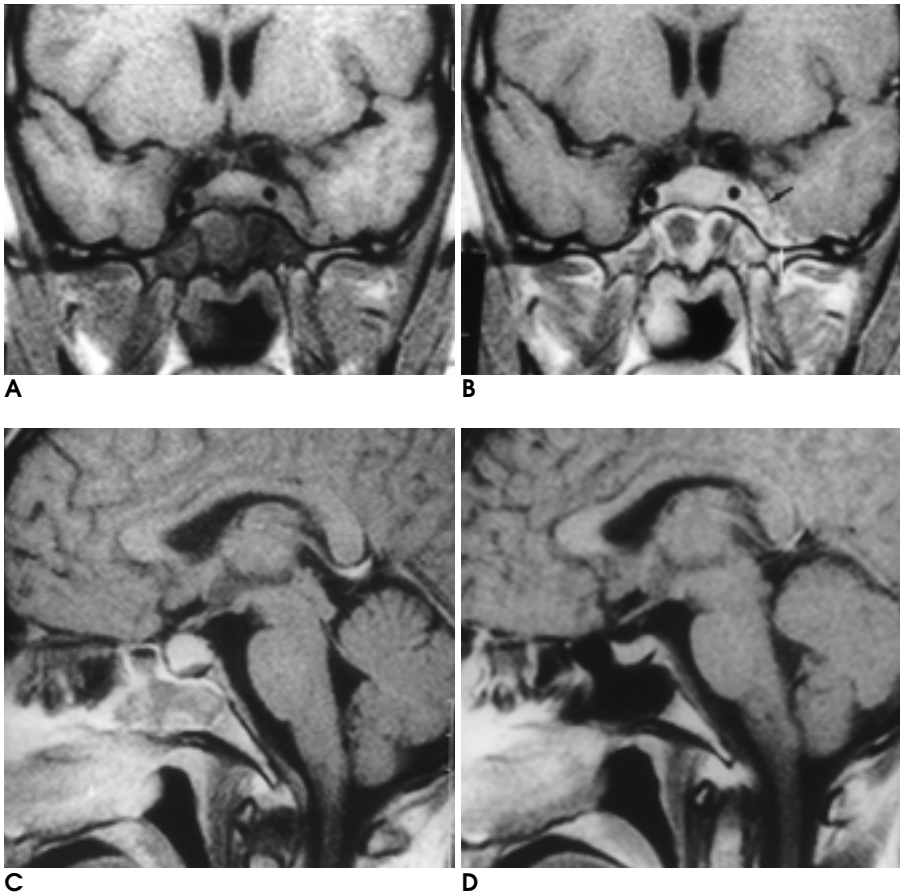
B

Fig. 1. Case 2 (35/M) with left septic cavernous sinus thrombosis. Axial T2-weighted (A) and enhanced T1-weighted (B) images show straightening or bulging of left cavernous sinus and multiple irregular filling defects (black arrow) within ipsilateral cavernous sinus on contrast study. Focal enhancements are also noted on meninx and medial portion of left temporal lobe (white arrow).

Table 2. MR Findings in Septic Cavernous Sinus Thrombosis

MR Findings	Case 1 (42/M)	Case 2 (35/M)	Case 3 (21/M)	Case 4 (64/F)	Case 5 (65/F)	Case 6 (26/F)
Site	L	L	L	R	L	L
Cavernous sinus						
Contour bulging	+	+	+	+	+	+
Filling defect	+	+	+	+	+	+
Internal carotid artery						
Small size	-	+	+	+	+	+
Upward displacement	+	-	+	+	-	+
Orbit						
Proptosis	-	-	+	+	-	-
Engorgement	-	-	+	+	-	-
Pituitary gland enlargement	-	+	+	+	+	+
Paranasal sinus inflammation						
Sphenoid	+	+	+	+	+	+
Maxillary	+	-	+	+	+	-
Ethmoid	+	-	-	+	+	+
Frontal	+	-	-	+	-	-
Other findings						
Meningeal enhancement	+	+	+	-	+	-
Parenchymal enhancement	+	+	-	-	-	-
Hydrocephalus	-	-	-	-	+	-
Cerebral infarction	-	-	-	-	-	+
Small Meckel's cave	-	+	-	+	-	+
Follow-up MR	+	+	+	-	-	-
Bulging of cavernous sinus						
Pituitary enlargement	-					

L: left, R: right, - : decrease

**Fig. 2.** Case 3 (21/M) with left septic cavernous sinus thrombosis.

Coronal T1-weighted (A) and enhanced T1-weighted (B) images show bulging of left cavernous sinus and multiple irregular filling defects (black arrow) within ipsilateral cavernous sinus on contrast study. Cavernous portion of left internal carotid artery is upward displaced and small as compared with right side. Focal enhancements are also noted on meninx and medial portion of left temporal lobe (white arrow). Enhanced sagittal T1-weighted image (C) shows enlargement of pituitary gland as compared to the his age and inflammatory change in sphenoid sinus. Follow-up enhanced sagittal T1-weighted image (D) in 13 months after antibiotics treatment for 1 week and sphenoidotomy shows remarkable decrease of pituitary gland in size and improvement of sphenoid sinus inflammation.

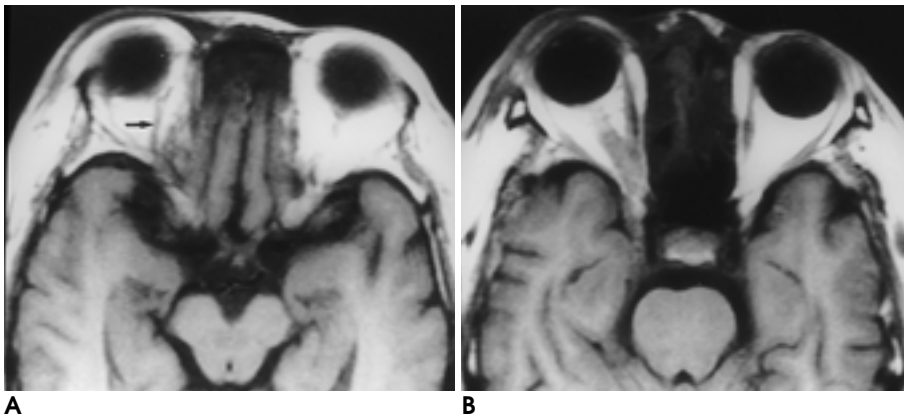


Fig. 3. Case 4 (64/F) with right septic cavernous sinus thrombosis. Axial T1-weighted image (**A**) shows engorgement of right superior ophthalmic vein (arrow). Another axial T1-weighted image (**B**) is 1cm caudal section from **A** shows prominent right proptosis.

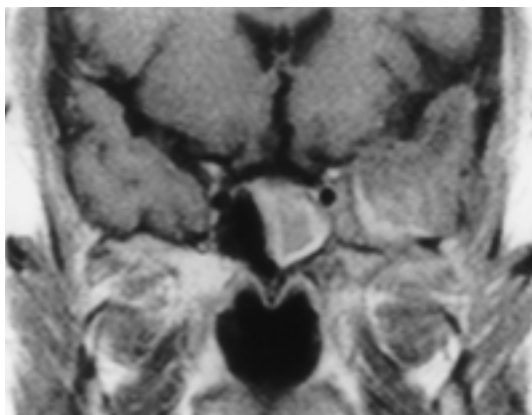


Fig. 4. Case 1 (42/M) with left septic cavernous sinus thrombosis. Enhanced coronal T1-weighted image shows enhancement on left temporal lobe and adjacent meninx. Inflammatory change in sphenoid sinus is well visualized.

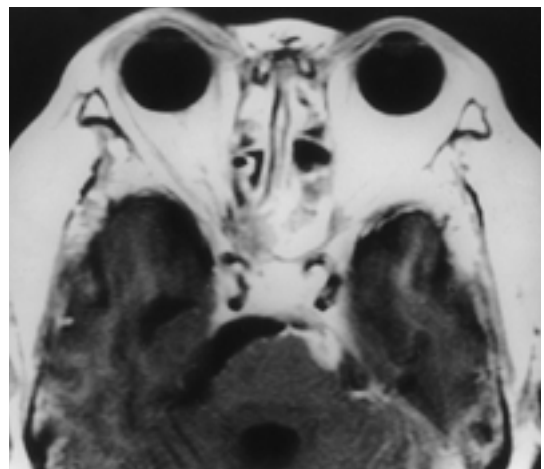


Fig. 5. Case 5 (65/F) with left septic cavernous sinus thrombosis. Enhanced axial T1-weighted image shows enhancement on anterior portion of the pons and adjacent meninx.

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(Fig. 4, 5), 1
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(Fig. 2D).
(circular or
intercavernous sinus) (spheno - parietal sinus)
(emissary vein) (pterygoid plexus),
(petrosal sinus)
(valve)
(5, 6). 가
50% 가
(7).
VI
III, IV, V₁, V₂
(sympathetic plexus)
(7, 8).
가 (6, 7).
(circular or

III, IV, VI 가 (Staphylococcus aureus)
가 90% VI 1/2 2/3 (Strepto - coc -
cus pneumoniae) , 10 - 20% Gram (-)
(rods)
V₁ V₂ 가 1/3 (sphenoidotomy and
1/5 가 50% drainage) 가 가 (6, 7).
가 (2, 12).
(2, 6, 7).
CT MR MR . MR
가
(4, 7).
5 가
가 . Meckel
42%
(6, 7). Schukne -
cht (3) T1 , T2
T1 T2
T1 T2
T1 T2
(em -
pyema)
(4, 7,
9).
(phlegmon), (allergic blephari -
tis), (ocular migraine), Tolosa - Hunt
(mucormy -
cosis), (aspergillus)가 (7, 10,
11).

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MR Findings of Septic Cavernous Sinus Thrombosis¹

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Purpose: To evaluate the MR findings of septic thrombosis of the cavernous sinus.

Materials and Methods: Eleven MR images of six patients with septic cavernous sinus thrombosis obtained over a five-year period and proven clinically or radiologically were retrospectively reviewed. The contour and enhancement pattern of the cavernous sinus, changes in the internal carotid artery, orbit, pituitary gland and sphenoid sinus, and intracranial abnormalities were analyzed and compared with the findings of follow-up studies.

Results: In all six patients, contrast study revealed asymmetrical enlargement of the ipsilateral cavernous sinus and multiple irregular filling defects within it. Narrowing of the cavernous portion of the ipsilateral internal carotid artery was noted in five patients, upward displacement of the ipsilateral internal carotid artery in four, ipsilateral proptosis with engorgement of the superior ophthalmic vein in two, pituitary enlargement in five, and inflammatory change in the sphenoid sinus in six. Associated intracranial abnormalities included edema and enhancement in the meninx, temporal lobe, or pons adjacent to the cavernous sinus in four patients, hydrocephalus in one, and cerebral infarction in one. Follow-up MR imaging indicated that the extent of asymmetrical enlargement of the cavernous sinus, filling defects within it, as seen on contrast study, and enlarged pituitary glands had all decreased, without significant interval change.

Conclusion: MR imaging is useful in the diagnosis of septic cavernous sinus thrombosis. Asymmetrical enlargement of the cavernous sinus, multiple irregular filling defect within it, as seen on contrast study, and changes in the internal carotid artery are characteristic findings.

Index words : Brain, MR

Cavernous sinus, MR

Thrombophlebitis

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