



UNIVERSIDAD
EL BOSQUE

Presentación:
Marco Tulio Borja
R. Neurocirugía
Tutoría:
Dr. Jorge Aristizábal
Dr. Juan Carlos Diez

REUNIÓN INTERINSTITUCIONAL



Por una cultura de la vida, su Calidad y su Sentido

Reunión interinstitucional

PRESENTACIÓN DE CASO CLÍNICO

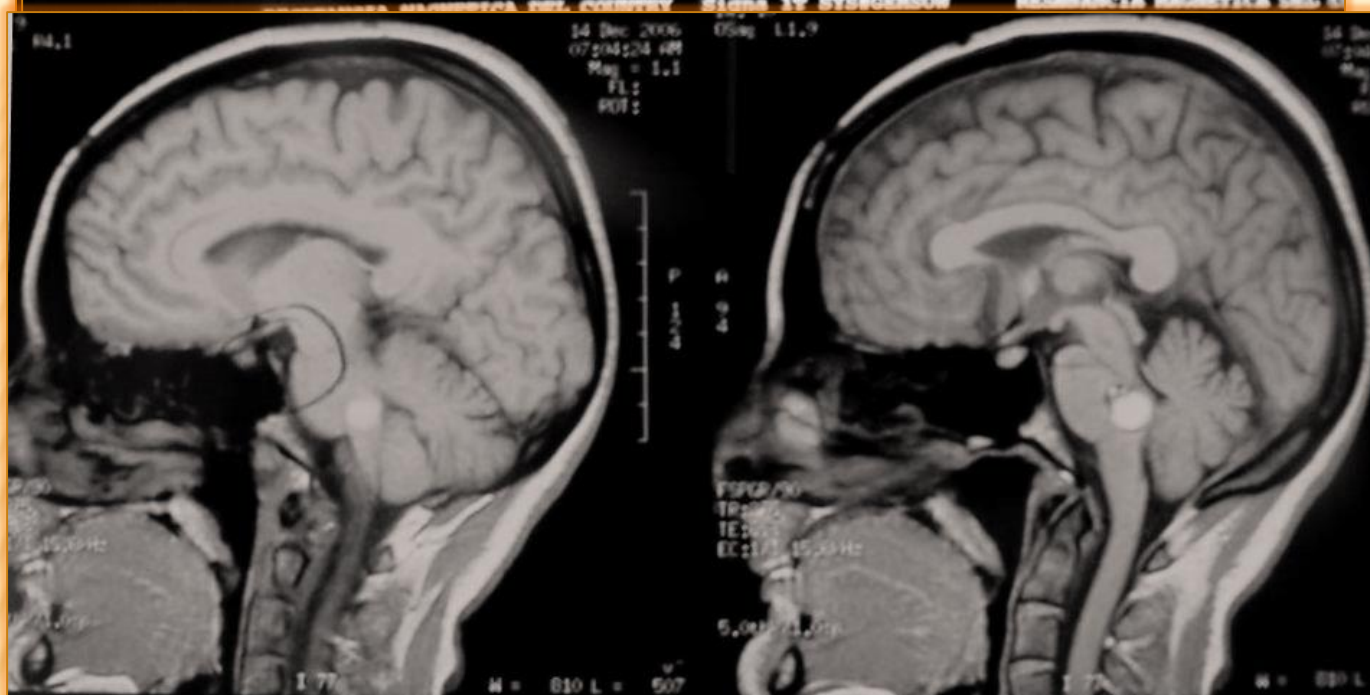
CASO CLÍNICO

- × N: B. H. M.
- × Edad: 46 años
- × Sexo: femenino.
- × Lateralidad: diestra.
- × Procedente: Bogotá

Dic. 4/2006

- × MC: cefalea, movimientos oculares rápidos diplopía y mareo
- × Inicio agudo. Cefalea pulsátil, global asociado a foto y sonofobia. Diplopía . Desviación de la comisura labial a la izquierda. Vértigo.

- × La siguiente semana: pérdida del equilibrio, tartamudeo y reaparece cefalea
- × 14 Diciembre RM cerebral

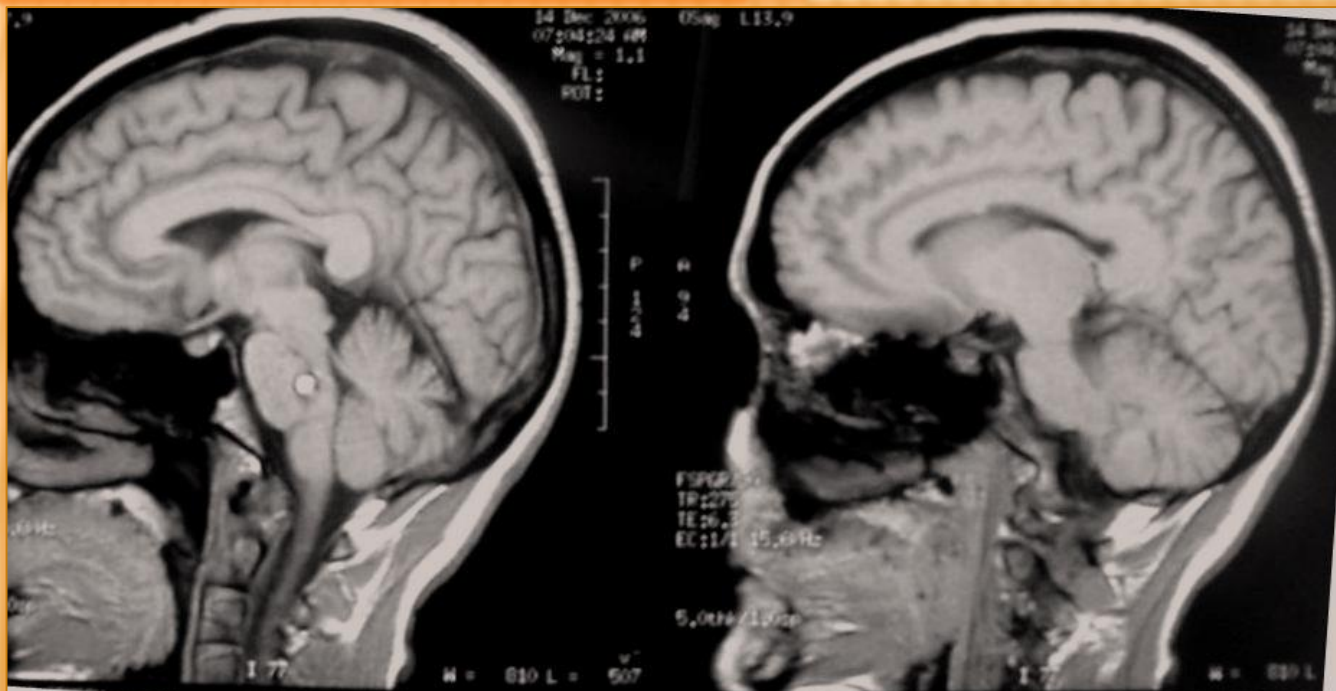


Dic. 14/ 2006

DIC 14 \ 2006

RM CEREBRAL

RM CEREBRAL



CASO CLÍNICO

- × Patología tumoral. No se descarta patología vascular. Se ordena arteriografía.

ANGIOGRAFÍA CONVENCIONAL

ENERO 09/ 2007

- × Farmacológicos: II

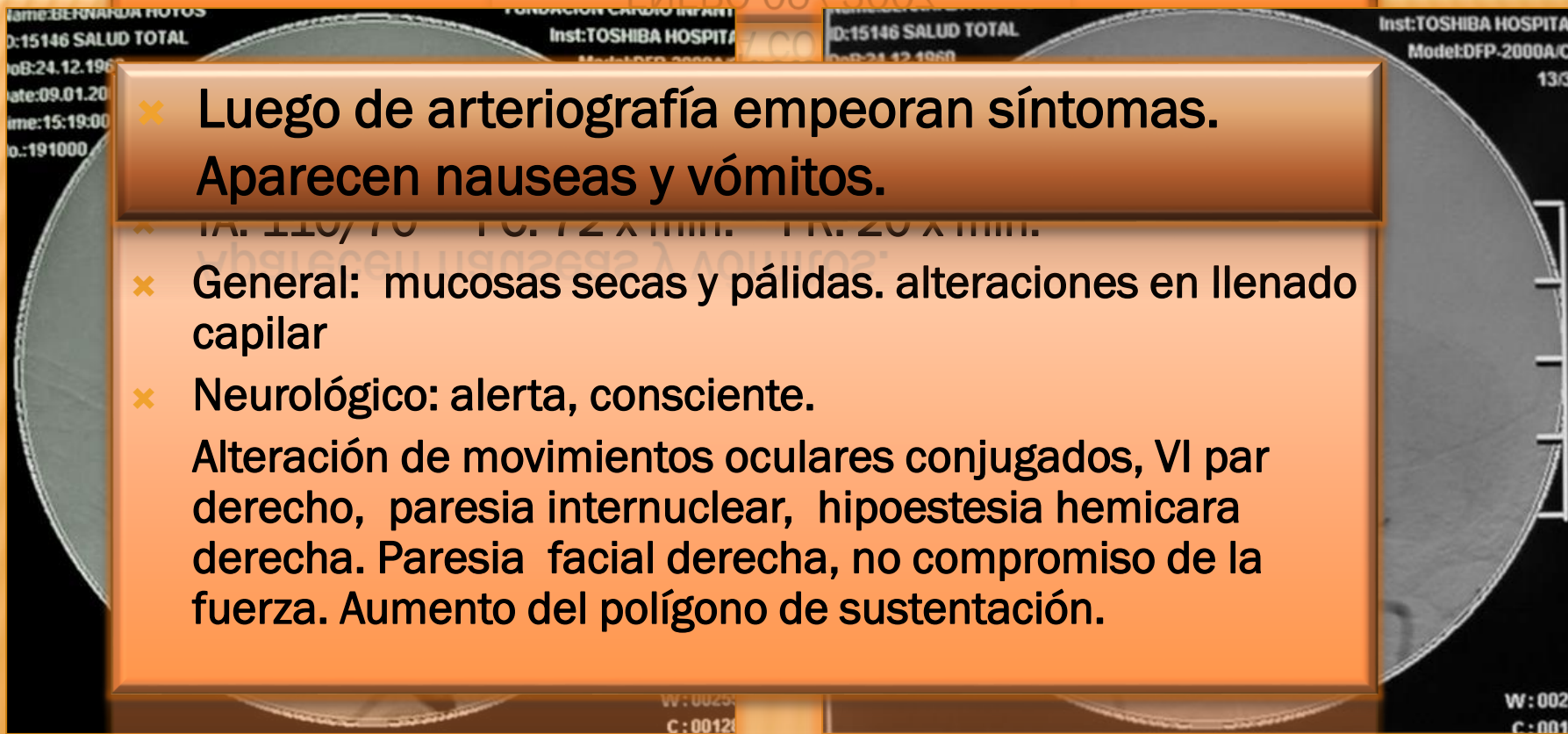
- × Toxicológicos: Fumadora 1 paquete diario. Alcohol social

- × Luego de arteriografía empeoran síntomas. Aparecen náuseas y vómitos.

- × General: mucosas secas y pálidas. alteraciones en llenado capilar

- × Neurológico: alerta, consciente.

Alteración de movimientos oculares conjugados, VI par derecho, paresia internuclear, hipoestesia hemicara derecha. Paresia facial derecha, no compromiso de la fuerza. Aumento del polígono de sustentación.

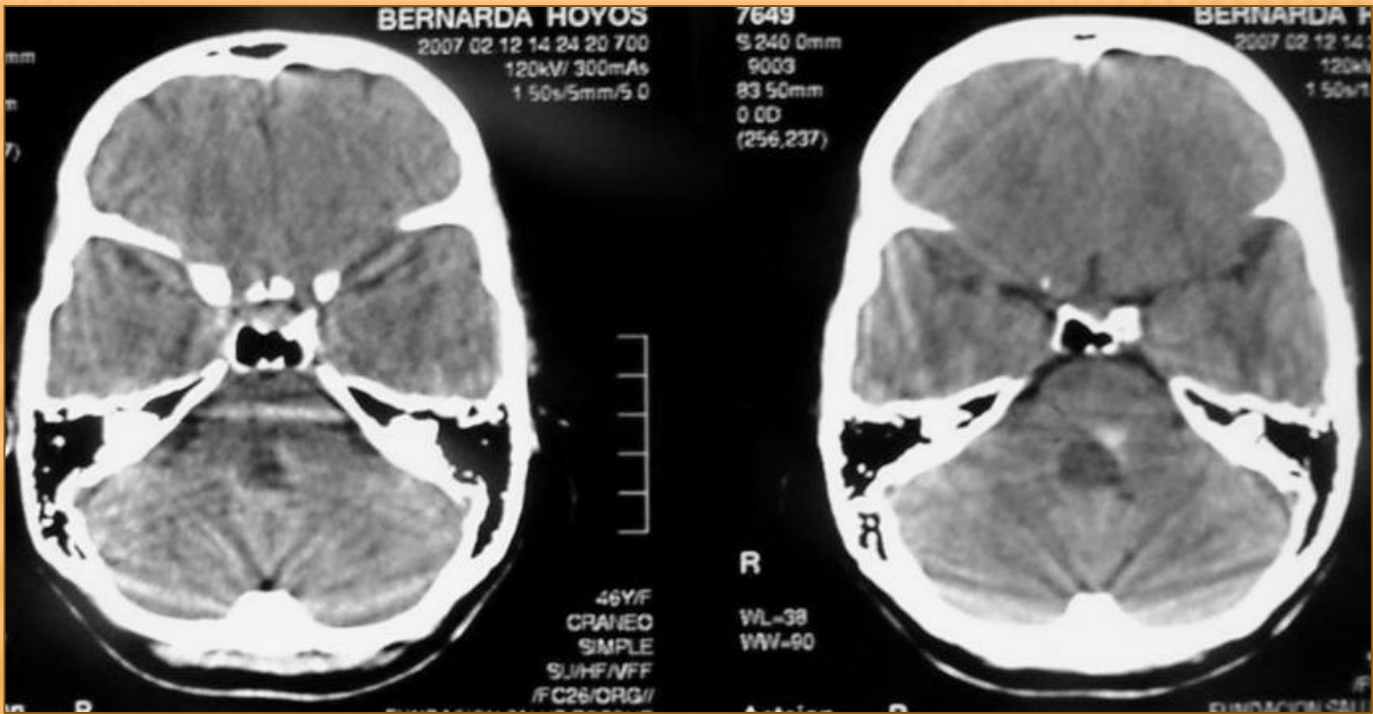


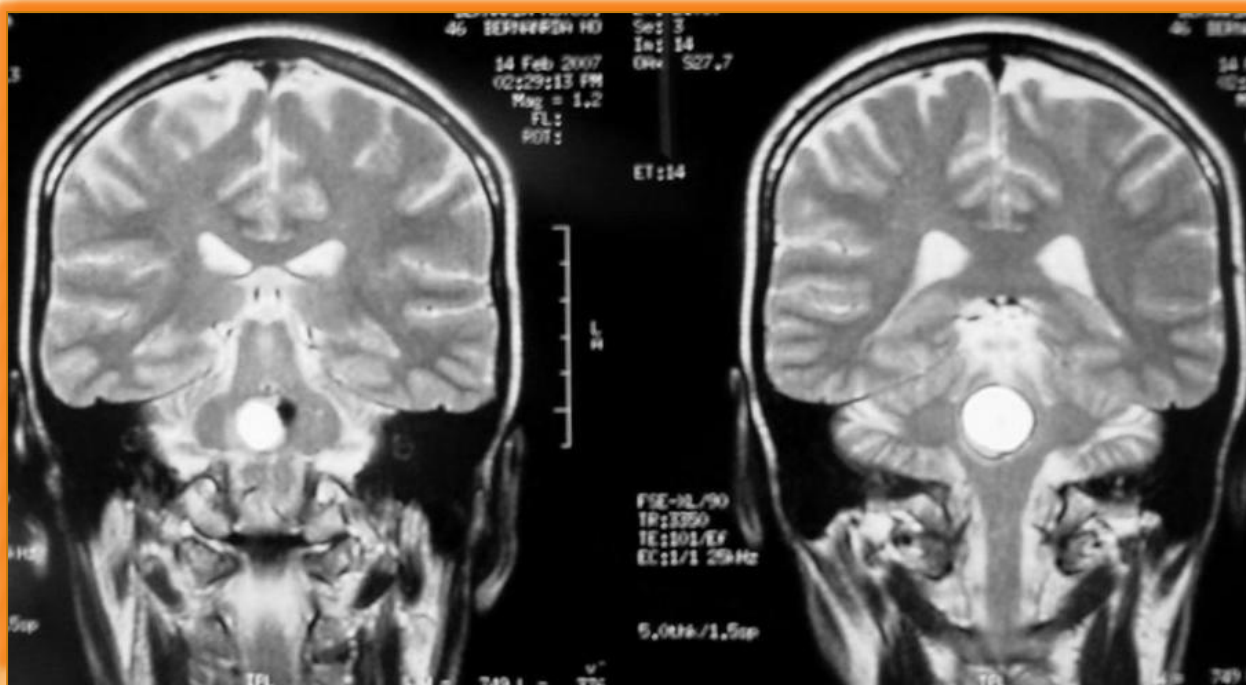
Feb. 12/ 2007

TAC DE CRÁNEO

TAC DE CRÁNEO

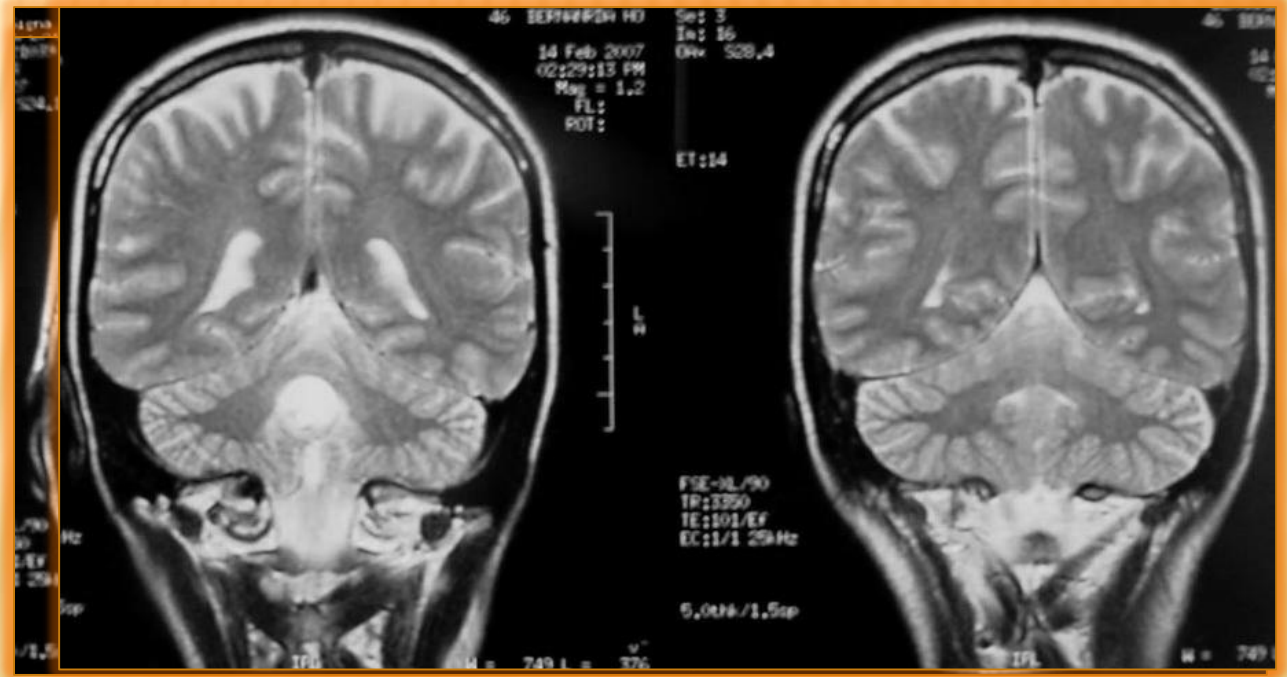
Feb 12 2007

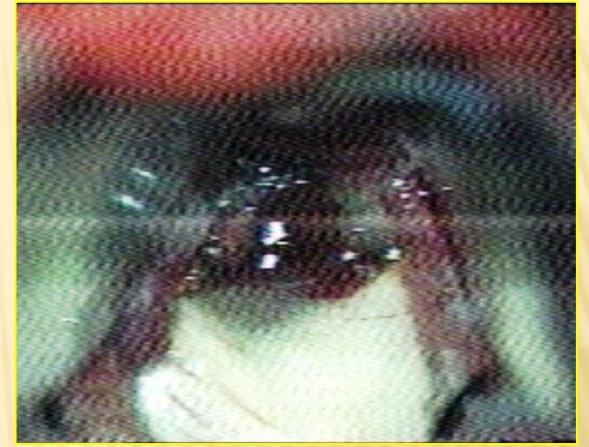
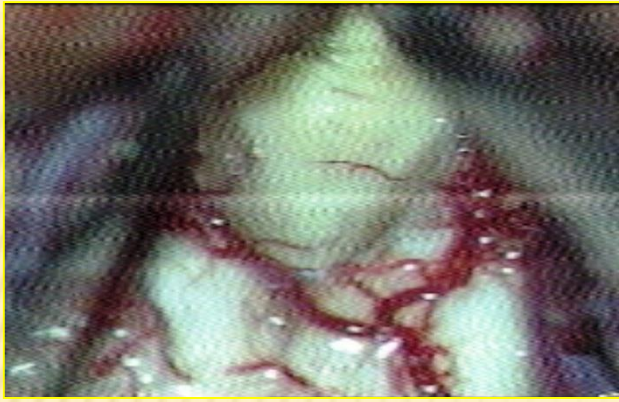


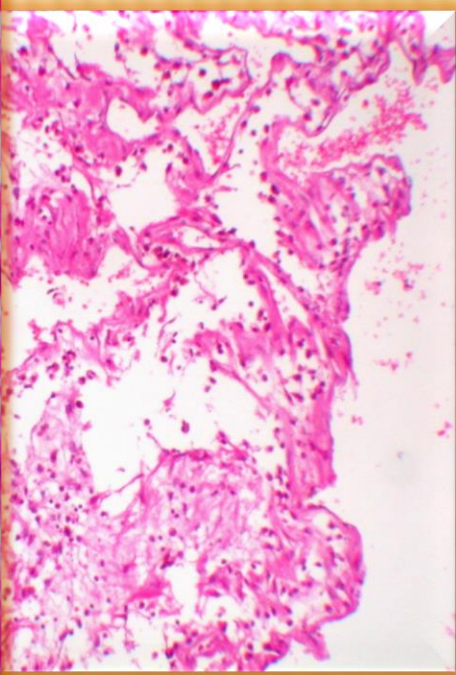
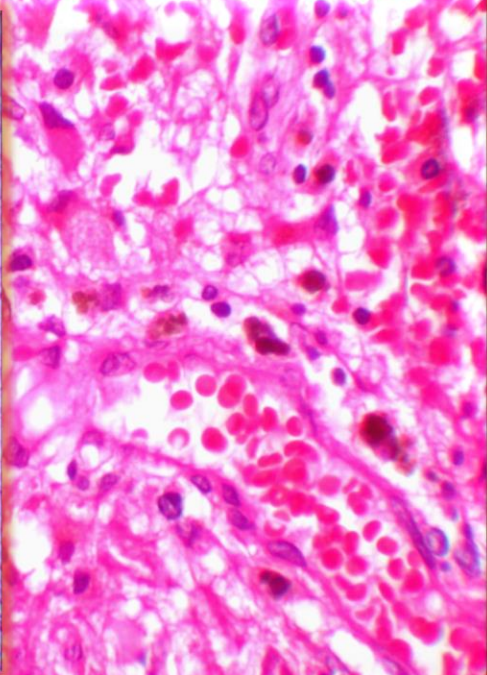
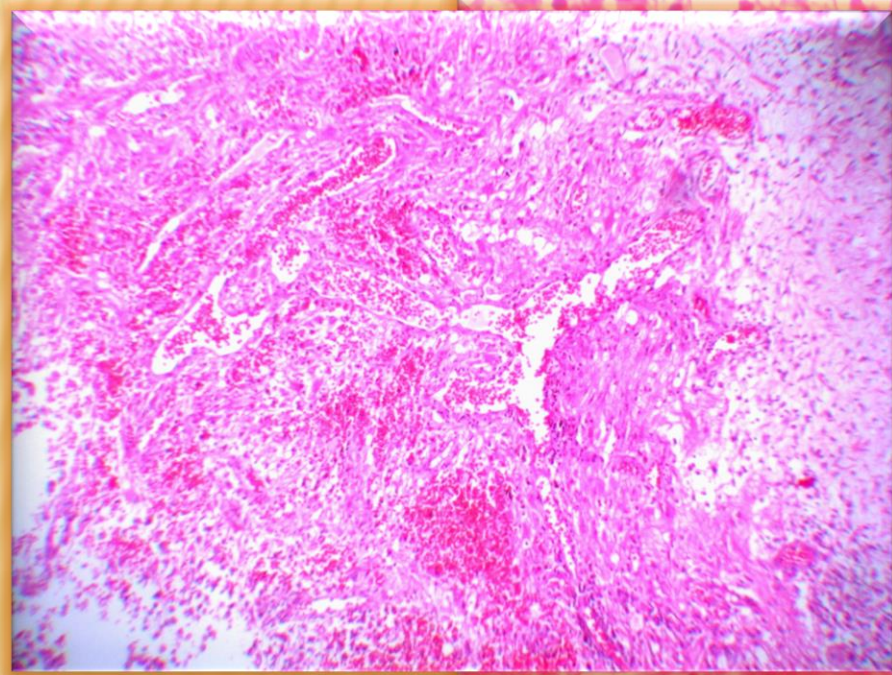
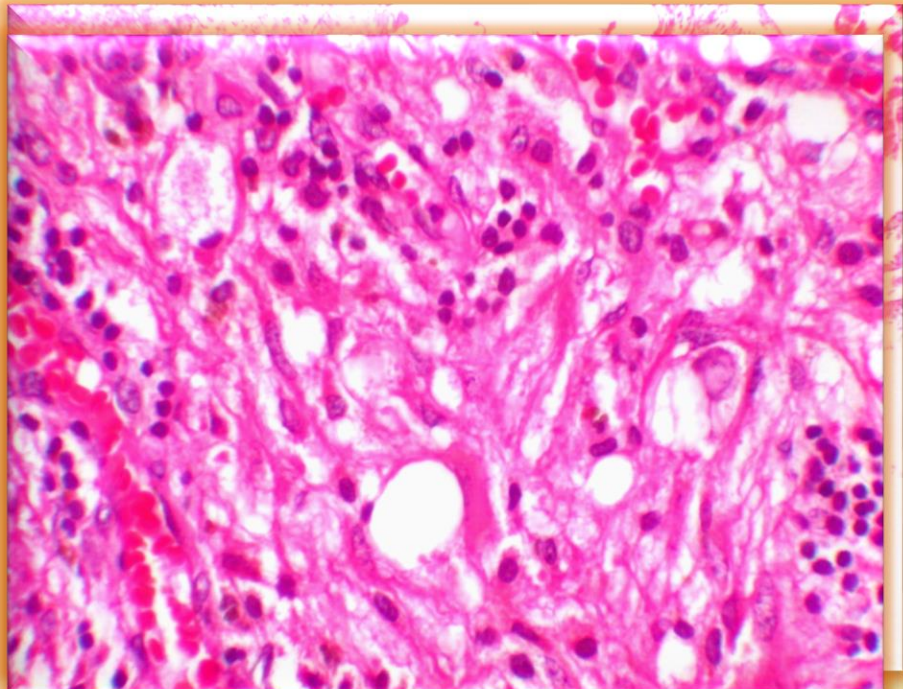
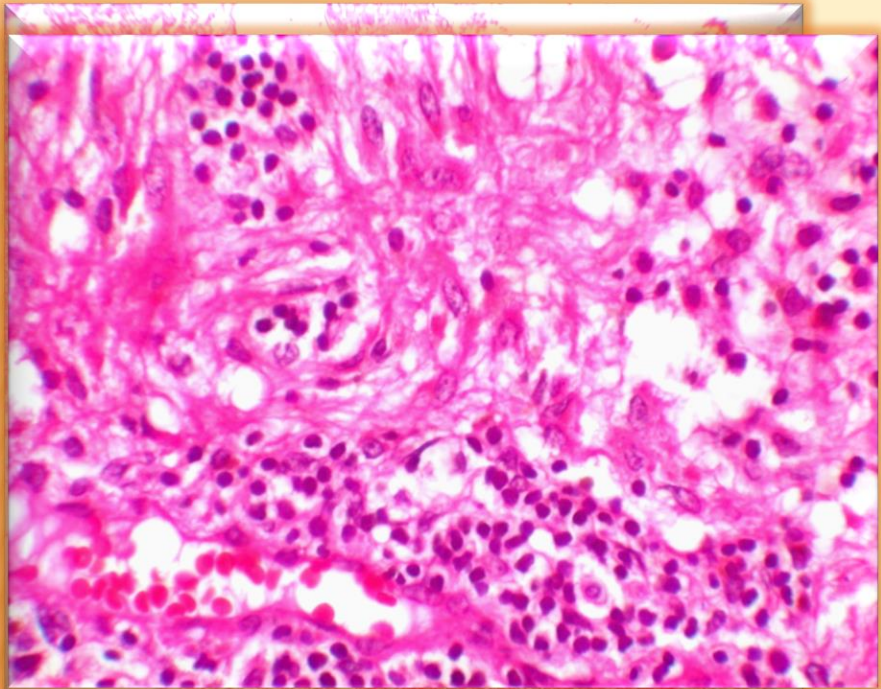


Feb 14/ 2007

RM CEREBRAL







CASO CLÍNICO

PACIENTE DE 8 AÑOS MUJER

INGRESA AL SERVICIO DE URGENCIAS POR CUADRO DE 3 DÍAS DE EVOLUCIÓN DE CEFALEA :

GLOBAL CONTINUA,
DE INICIO SÚBITO,
LA CUAL NO MEJORA CON EL TRATAMIENTO MÉDICO,

SE ASOCIA A VÉRTIGO,

INESTABILIDAD PARA CAMINAR Y AUMENTO DEL POLÍGONO DE SUTENTACIÓN,

HAY ALTERACIÓN VISUAL LA CUAL NO ES MUY CLARA.

AP SIN RELACIÓN CON LA ENFERMEDAD ACTUAL.

**AL INGRESO PACIENTE EN REGULAR ESTADO GENERAL,
HIDRATADA AFEBRIL SIN CIANOSIS NI SDR.**

SIGNOS VITALES NORMALES

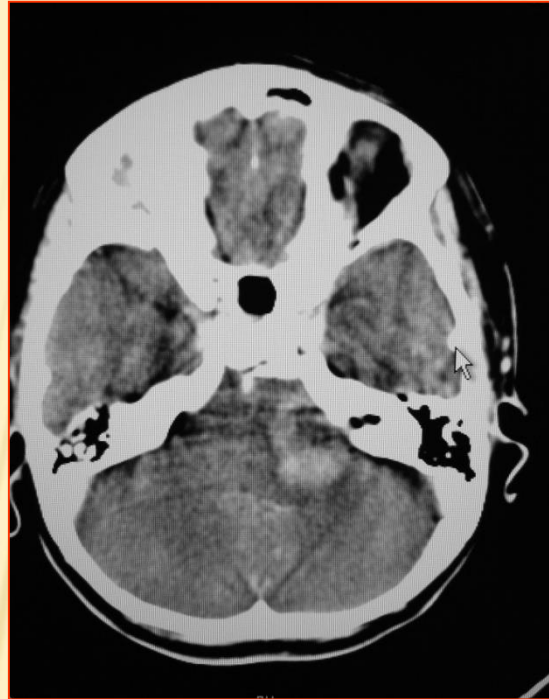
**PATRÓN RESPIRATORIO REGULAR, HEMODINÁMICAMENTE
ESTABLE, ESFERA MENTAL NORMAL.**

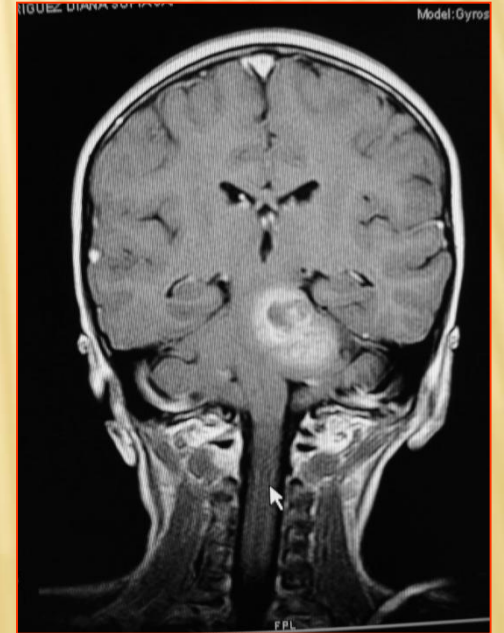
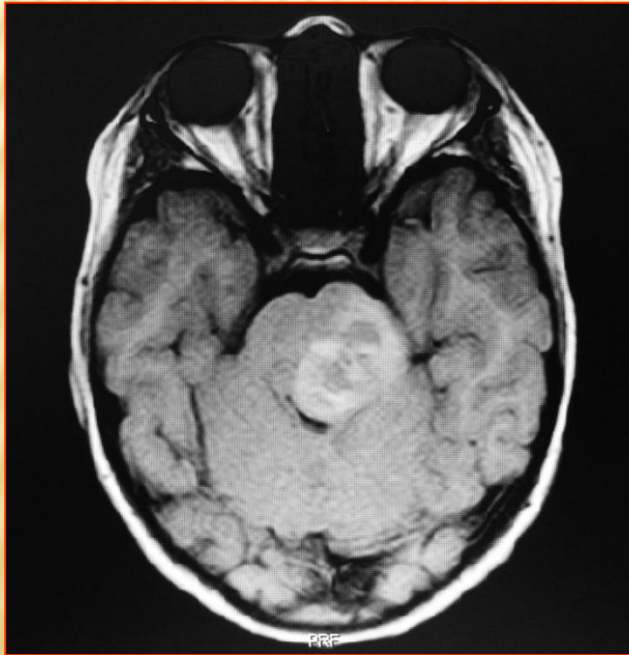
PARES CRANEANOS POSITIVO NISTAGMUS MIXTO.

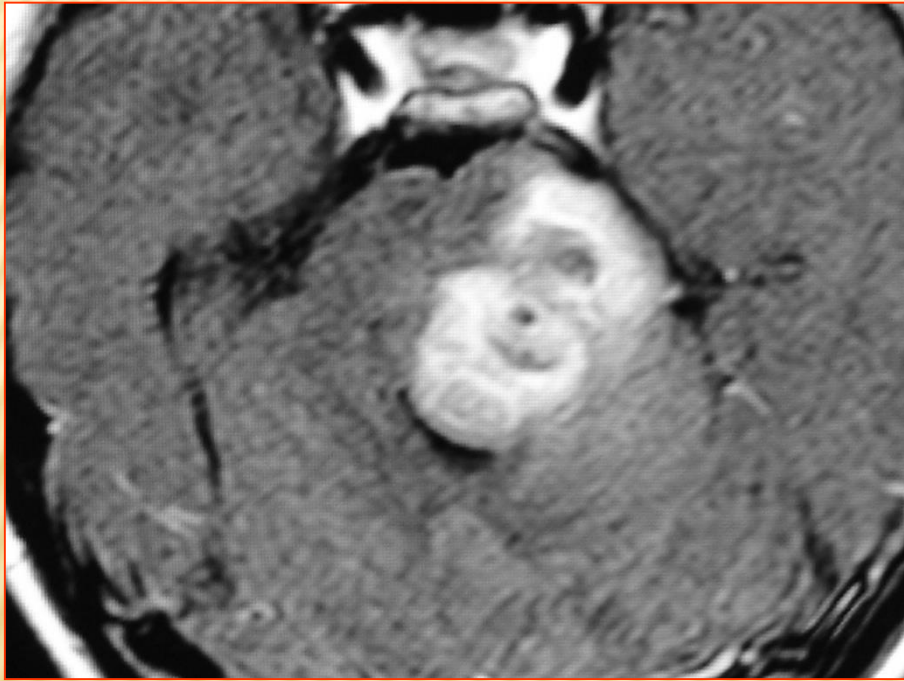
**ALTERACIÓN EN LA COORDINACIÓN IZQUIERDA Y MARCHA
CON LATEROPULSIÓN A LA IZQUIERDA, AUMENTO DEL
POLÍGONO DE SUTESTACIÓN.**

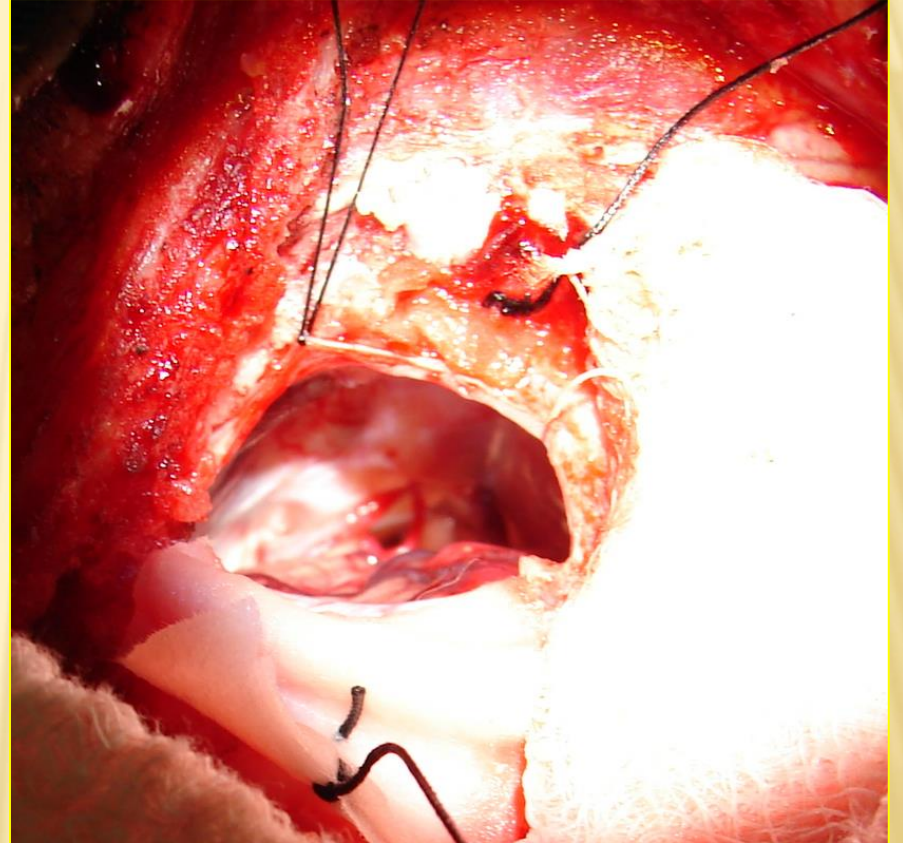
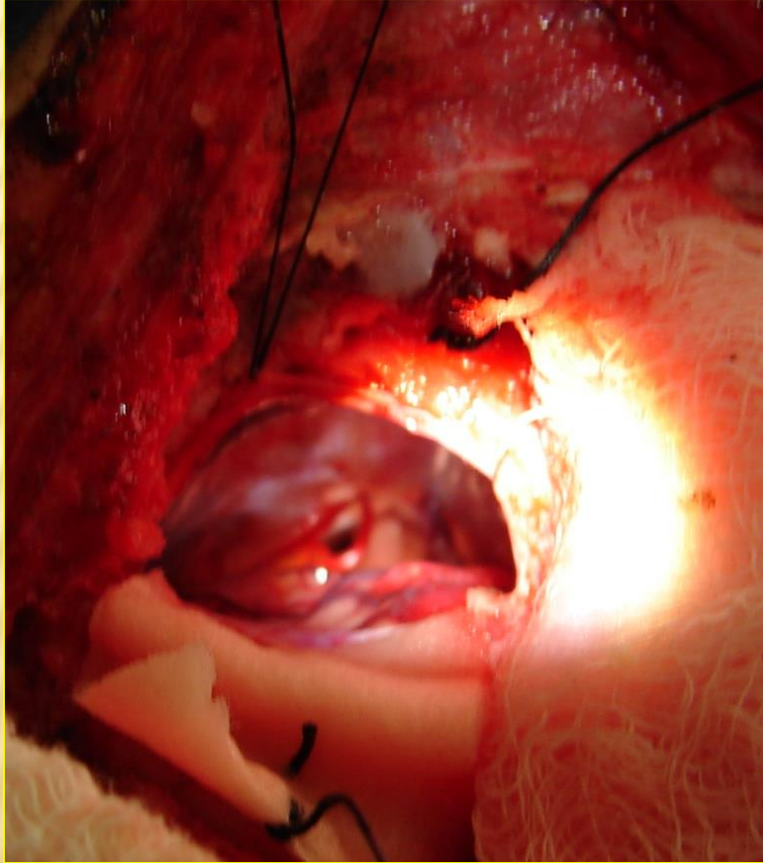
**HIPERREFLEXIA GENERALIZADA, LEVE HIPOESTESIA FACIAL.
NO SIGNOS MENÍNGEOS, DOLOR OCCIPITAL.**

**ID SÍNDROME CEREBELOSO EN ESTUDIO
 SÍNDROME DOLOROSO CEFALEA**



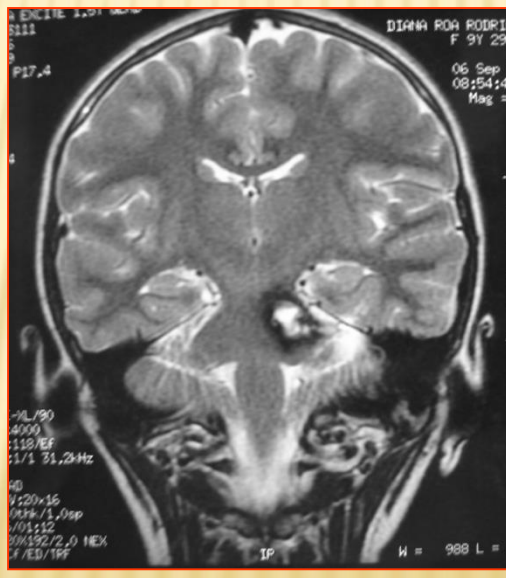
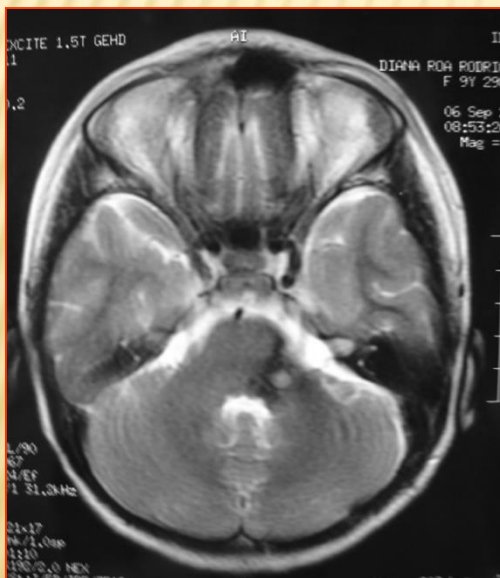
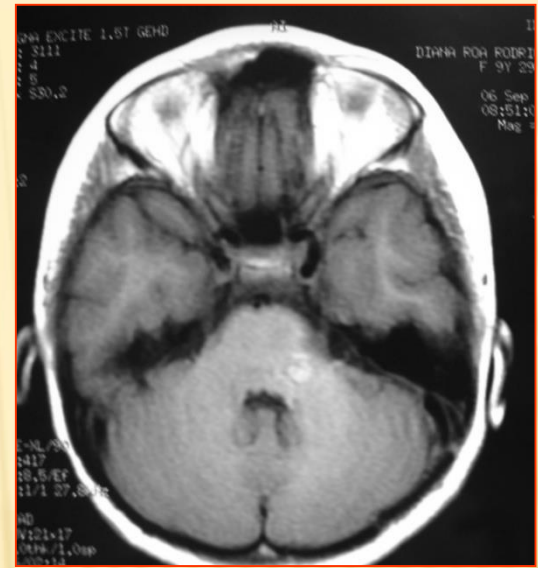
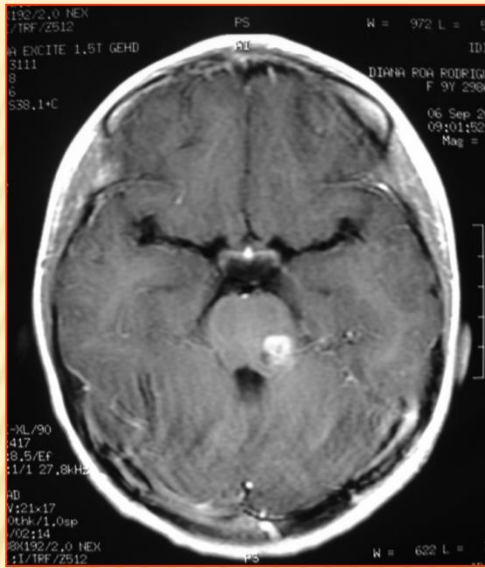
















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Reunión interinstitucional

MALFORMACIONES CAVERNOSAS



Reunión interinstitucional

MALFORMACIONES CAVERNOSAS

MALFORMACIONES CAVERNOSAS

- ✘ Compactas, ocasionalmente múltiples
- ✘ Crisis, cefalea, sangrado
- ✘ Varios miembros de la familia

- ✘ La mayoría cerebrales (ST).
- ✘ 1 de 4 a 5 son infratentoriales

ETIOLOGÍA

✗ congénito

CCM1 - 7q

CCM2 - 7p

CCM3 - 3q

✗ Proteína KRIT1

✗ adquirido

76 casos. 60.45 Gy.

Latencia: 8.5 años

Edad promedio: 11,7 años

27 paciente con lesiones múltiples

Guzeloglu-
1/Cerebra
Neurosurg

Review of the literature on de novo formation of cavernous malformations of the central nervous system after radiation therapy. Nimjee S M., M.D., Ph.D., Powers C J., M.D., Ph.D., Bulsara K R., M.D. Neurosurg Focus 21 (1):E4, 2006

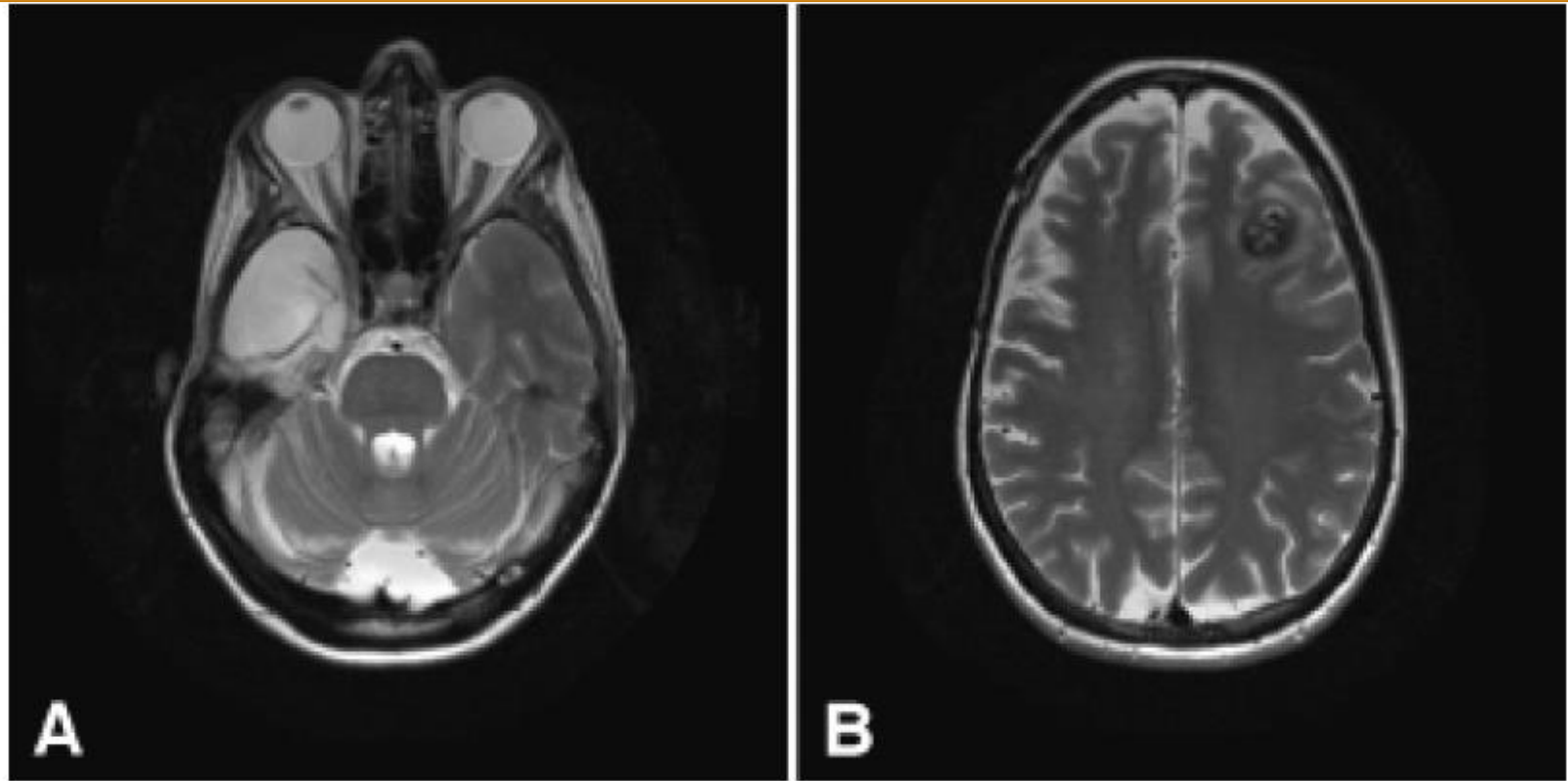


FIG. 1. This 40-year-old woman underwent resection of a right temporal anaplastic astrocytoma in 1997, followed by 46 Gy WBRT. An axial T₂-weighted MR image obtained in 2006 demonstrates the right temporal resection cavity from the previous surgery and a small cavernoma in the left temporal lobe (*left*) as well as another cavernoma of the left frontal lobe (*right*).

lobe (right).
 the previous surgery and a small cavernoma in the left temporal lobe (left) as well as another cavernoma of the left frontal
 46 Gy WBRT. An axial T₂-weighted MR image obtained in 2006 demonstrates the right temporal resection cavity from

FIG. 1. This 40-year-old woman underwent resection of a right temporal anaplastic astrocytoma in 1997, followed by



HISTORIA NATURAL

*Location of the site of initial bleed and epileptic focus
in the hemorrhage and seizure groups*

*Subsequent bleeding among patients with hemorrhagic
lesions according to location*

Location	Subsequent Bleed					
	Lesion Location	Total Cases	No. of Cases	Rate/ Lesion/Yr	Mean Follow-Up Time (yrs)	Age at Onset (yrs), Sex (m/f)
frontal	frontal lobe	13	4	16.1%	2.39	23.5, 5:8
parietal	parietal lobe	10	5	23.2%	2.15	44.7, 3:7
temporal	temporal lobe	9	3	57.5%	0.58	39.8, 3:6
occipital	basal ganglia	7	2	11.0%	6.51	35.0, 4:3
basal ganglia	brainstem	15	9	21.5%	5.59	37.8, 7:8

Aiba T, M.D., Tanaka R, M.D., Koike T M.D. Et Al: Natural History Of Intracranial Cavernous Malformations. J Neurosurg 83:56-59, 1995

EPIDEMIOLOGÍA

× MAC: 0,4 – 0,9%

× 8-15% de todas las MVs

× 9 al 35% afectando TC

-Fritschi JA, Reulen HJ, Spetzler RF, et al: Cavernous malformations of the brain stem. A review of 139 cases. **Acta Neurochir 130:35–46, 1994**

-Kondziolka D, Lunsford LD, Kestle JRW: The natural history of cerebral cavernous malformations. **J Neurosurg 83: 820–824, 1995**

-Simard JM, Garcia-Bengochea F, Ballinger WE Jr, et al: Cavernous angioma: a review of 126 collected and 12 new clinical cases. **Neurosurgery 18:162–172, 1986**

- Sage MR, Brophy BP, Sweeney C, et al: Cavernous haemangiomas (angiomas) of the brain: clinically significant lesions. **Australas Radiol 37:147–155, 1993**

PRESENTACIÓN CLÍNICA

Cefalea (16), v 76: lesión única
vómito (18), ne 24: múltiples lesiones
crisis (3), hidro
Cervicalgia, sin Sangrado: 182 en 100 pctes
3646 años
Riesgo de sangrado: 5%
Resangrado: 30%

103 MC
39 puente
16 mesencéfalo
16 bulbo
15 P-M
10 P-B
2: tálamo
5: 2 niveles

Cavernous malformations of the brainstem: experience with 100 patients

RANDALL W. PORTER, M.D., PAUL W. DETWILER, M.S., M.D., ROBERT F. SPETZLER, M.D.,
MICHAEL T. LAWTON, M.D., JONATHAN J. BASKIN, M.D., PATRICK T. DERKSEN,
AND JOSEPH M. ZABRAMSKI, M.D.

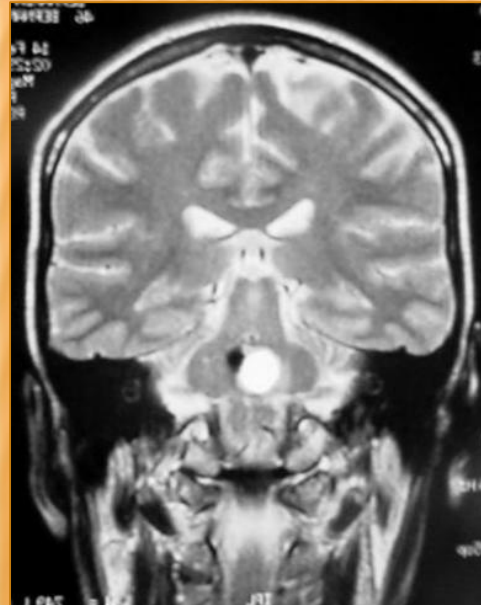
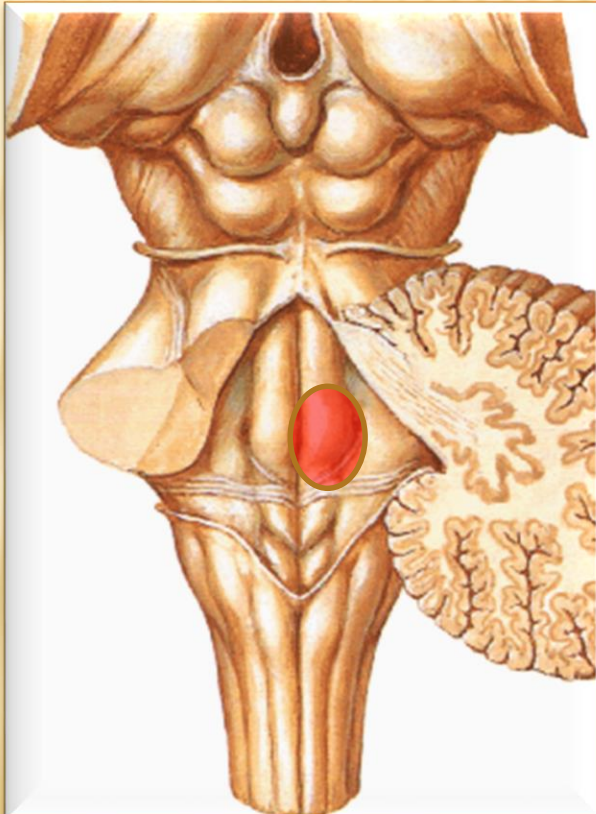
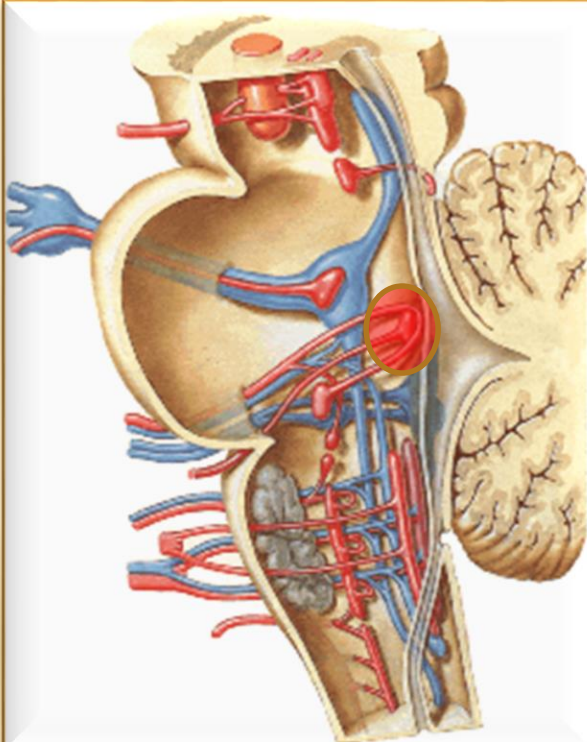
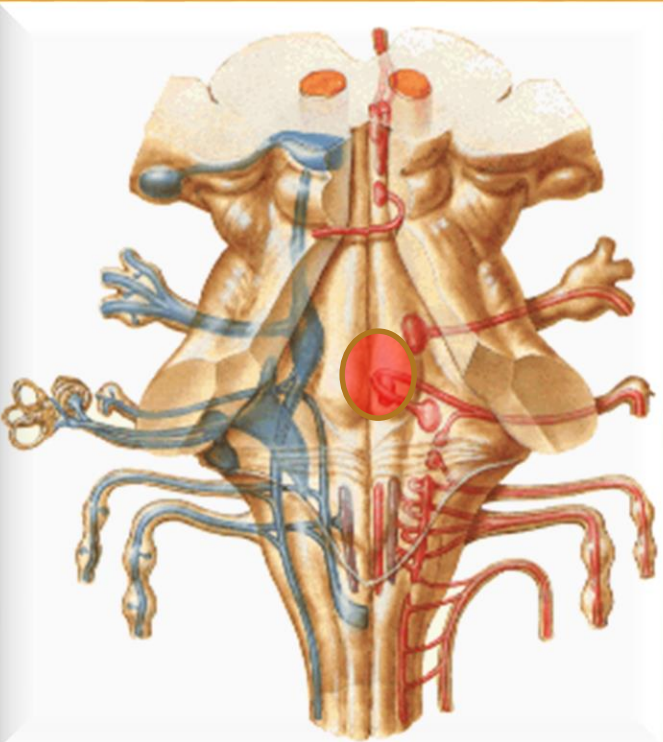
Division of Neurological Surgery, Barrow Neurological Institute, Phoenix, Arizona; Mercy Healthcare Arizona, Phoenix, Arizona; Department of Neurosurgery, University of California San Francisco, San Francisco, California; and University of Iowa, Iowa City, Iowa

PRESENTACIÓN CLÍNICA

× 4ta a 5ta década de la vida

× 139 pctes: 24 menores de 18 años

Fritschi JA, Reulen HJ, Spetzler RF, Zabramski JM: Cavernous malformations of the brain stem. A review of 139 cases. *Acta Neurochir (Wien)* 130:35-46, 1994



ACTIVIDAD BIOLÓGICA

✗ Biológicamente estables

1. Aiba T, Tanaka R, Koike T, Kameyama S, Takeda N, Komata T: Natural history of intracranial cavernous malformations. **J Neurosurg** 83:56–59, 1995

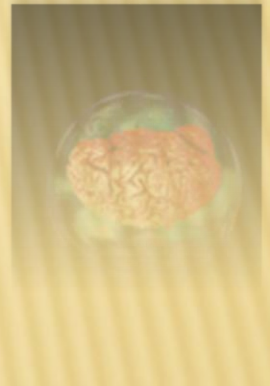
2. Bertalanffy H, Gilsbach JM, Eggert HR, Seeger W: Microsurgery of deep-seated cavernous angiomas: report of 26 cases. **Acta Neurochir** 108:91–99, 1991

✗ Lesiones dinámicas o adquiridas

Brunken M, Sagehorn S, Leppien A, Muller-Jensen A, Halves E: Neuformation eines Cavernoms bei begleitender, vorbestehender venöser Malformation unter immunsuppressiver Behandlung. **Zentralbl Neurochir** 60:81–85, 1999

Houtteville JP. Brain cavernoma: a dynamic lesion. **Surg Neurol** 48:610–614, 1997

Labauge P, Brunereau L, Coubes P, Clanet M, Tannier C, Laberge S, et al: Appearance of new lesions in two nonfamilial cerebral cavernoma patients. **Eur Neurol** 45:83–88, 2001

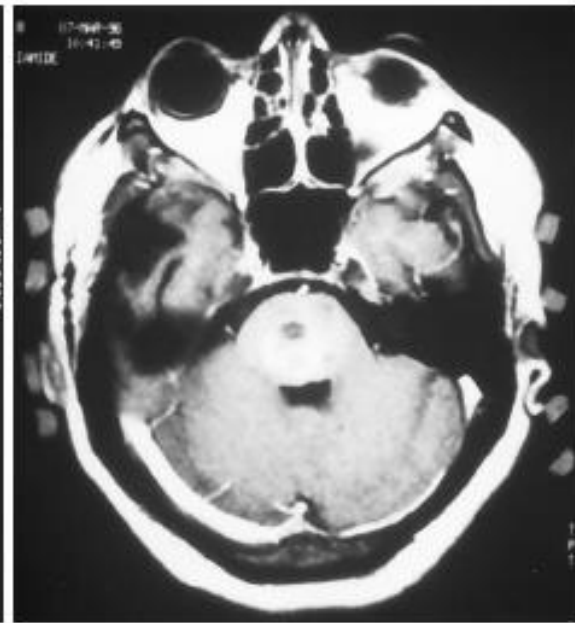
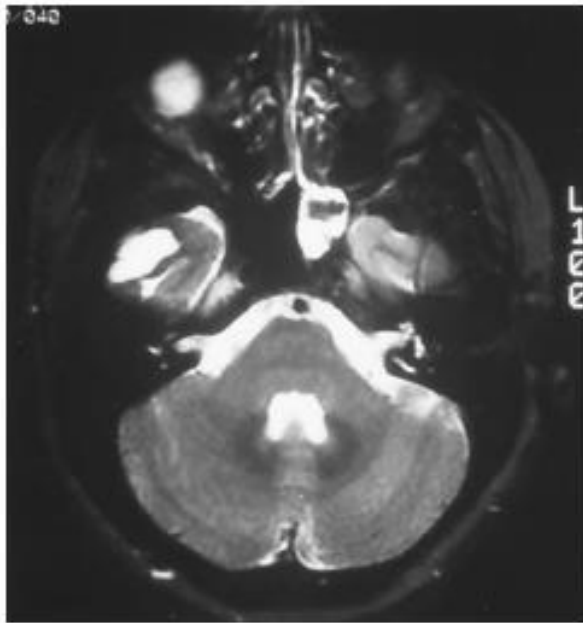


ACTIVIDAD BIOLÓGICA

Proliferación

Neoangiogénesis

No hay recurrencia



les.

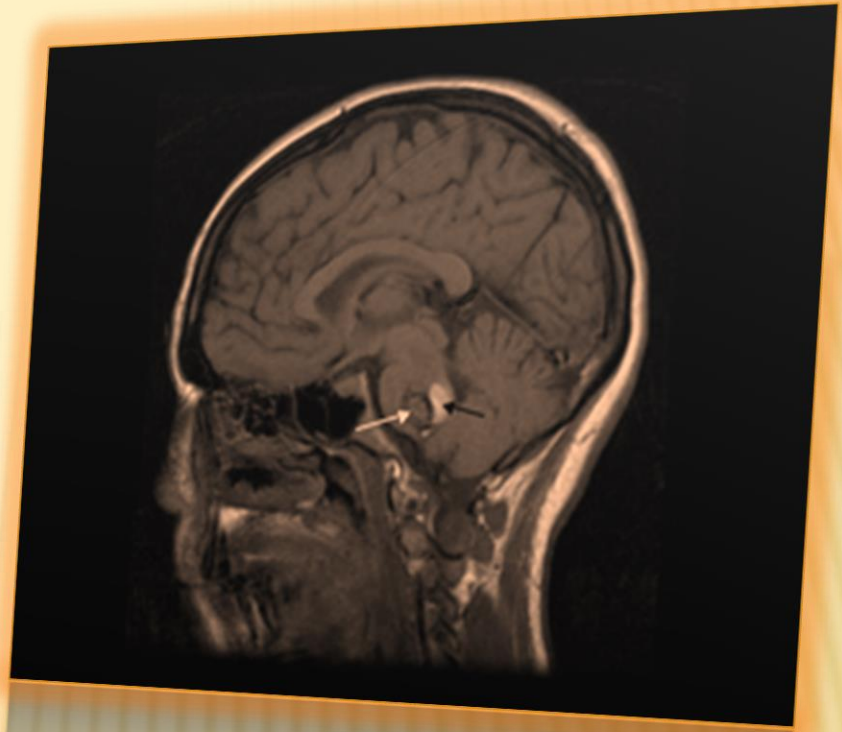
ations:

Cavernous malformations of the brainstem: experience with 100 patients.. Porter RW. M.D., Detwiler P. W, M.S., M.D., Spetzler R F, M.D., Lawton M T, M.D., Baskin, DerksenJJ, M.D., PT., Zabramski J M, M.D. *J Neurosurg* 90:50–58, 1999

ADRIAN M. SIEGEL, M.D., AND HELMUT BERTALANFFY, M.D.

Department of Neurosurgery, Philipps-University, Marburg, Germany; and Department of Neurology, University of Zürich, Switzerland

J Neurosurg 102:342–347, 2005



Malformaciones cavernosas

ASPECTOS IMAGENOLÓGICOS

Kashimura H, M.D.; Inoue T., M.D.; Ogasawara K, M.D. et al: Pontine Cavernous Angioma Resected Using The Subtemporal, Anterior Transpetrosal Approach Determined Using Three-dimensional Anisotropy Contrast Imaging: Technical Case Report. *Neurosurg* 58[ONS Suppl 1]:ONS-175, 2006

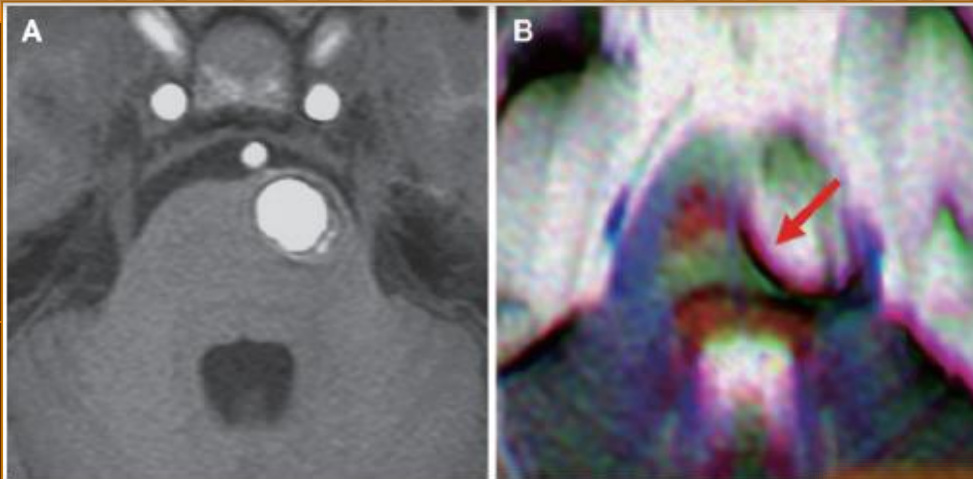


FIGURE 1. A, preoperative short-inversion-time inversion recovery showing a mass lesion located in the anterolateral part of the pons. B, preoperative 3-DAC showing the lesion compressing the corticospinal and corticopontine tracts posteromedially. Corticospinal and corticopontine tracts are revealed as red (red arrow). The lesion is depicted as a signal absence caused by artifact from the hematoma.

Zabramski Classification of Malformations

Hyperintense on T1- and T2-weighted

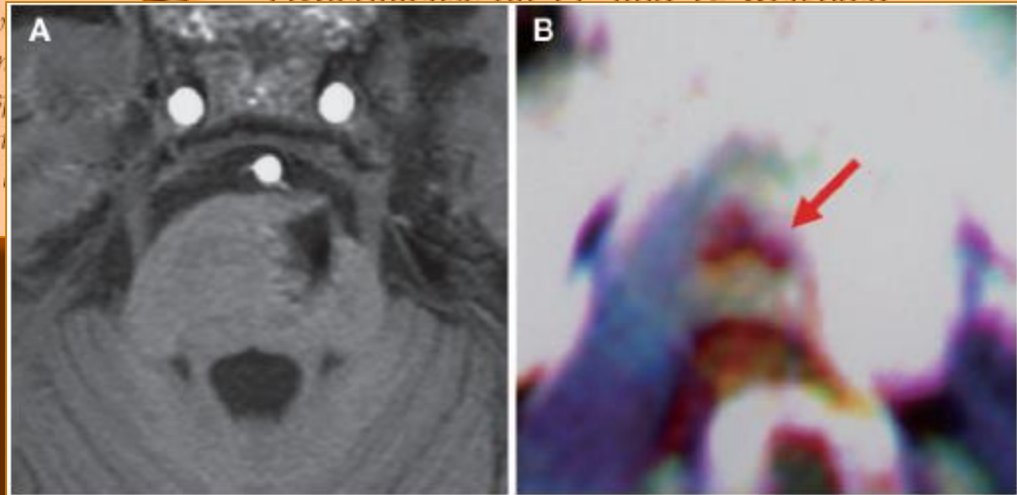
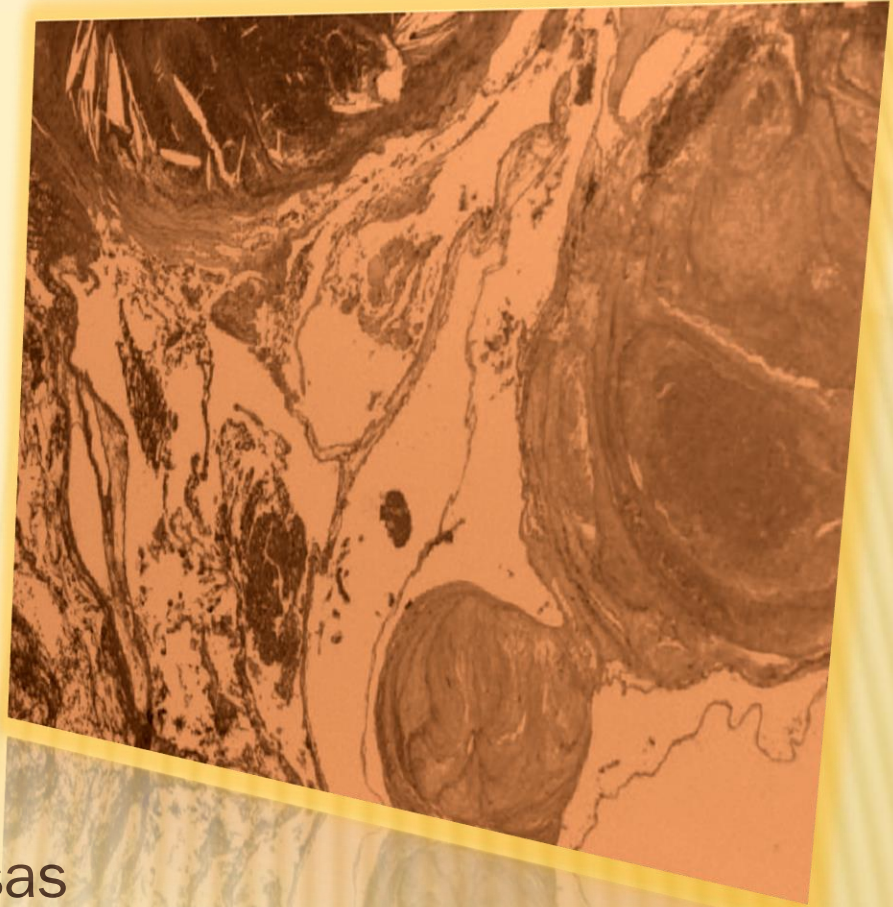


FIGURE 2. A, postoperative short-inversion-time inversion recovery image showing total removal of the lesion. B, postoperative 3-DAC image showing the intact left corticospinal and corticopontine tracts (red arrow).

Rigamonti D, Drayer BP, Johnson PC, Hadley MN, Zabramski KM. The appearance of cavernous malformations (angiomas).

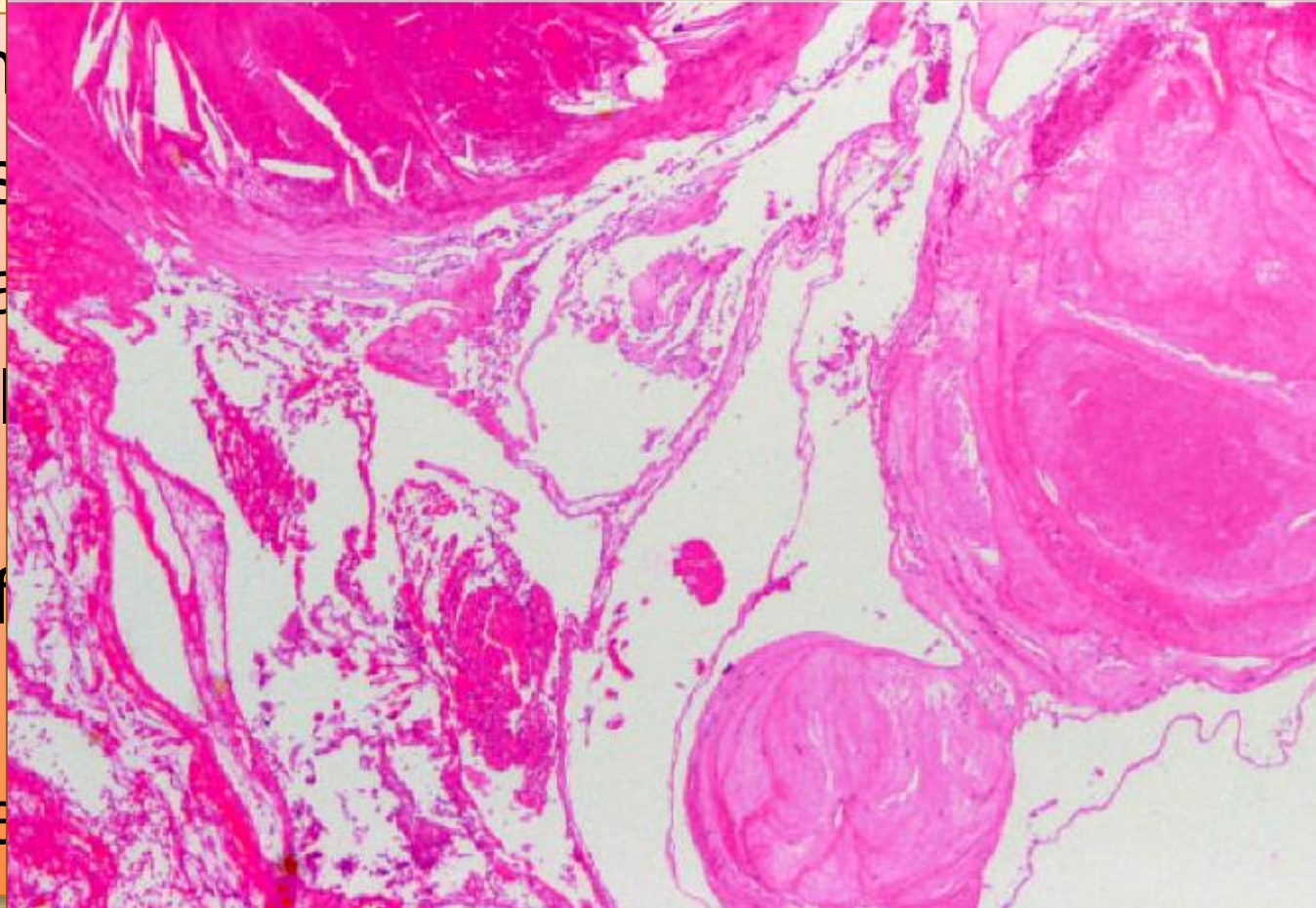


Malformaciones cavernosas

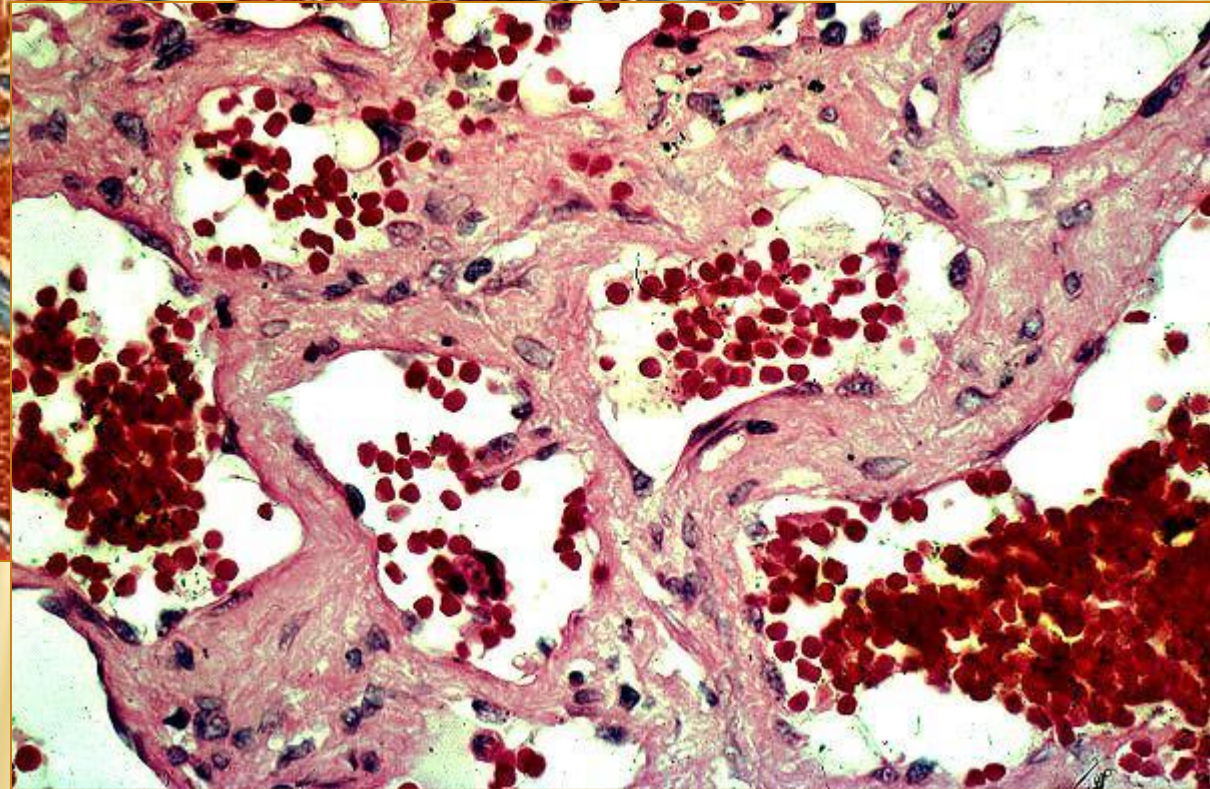
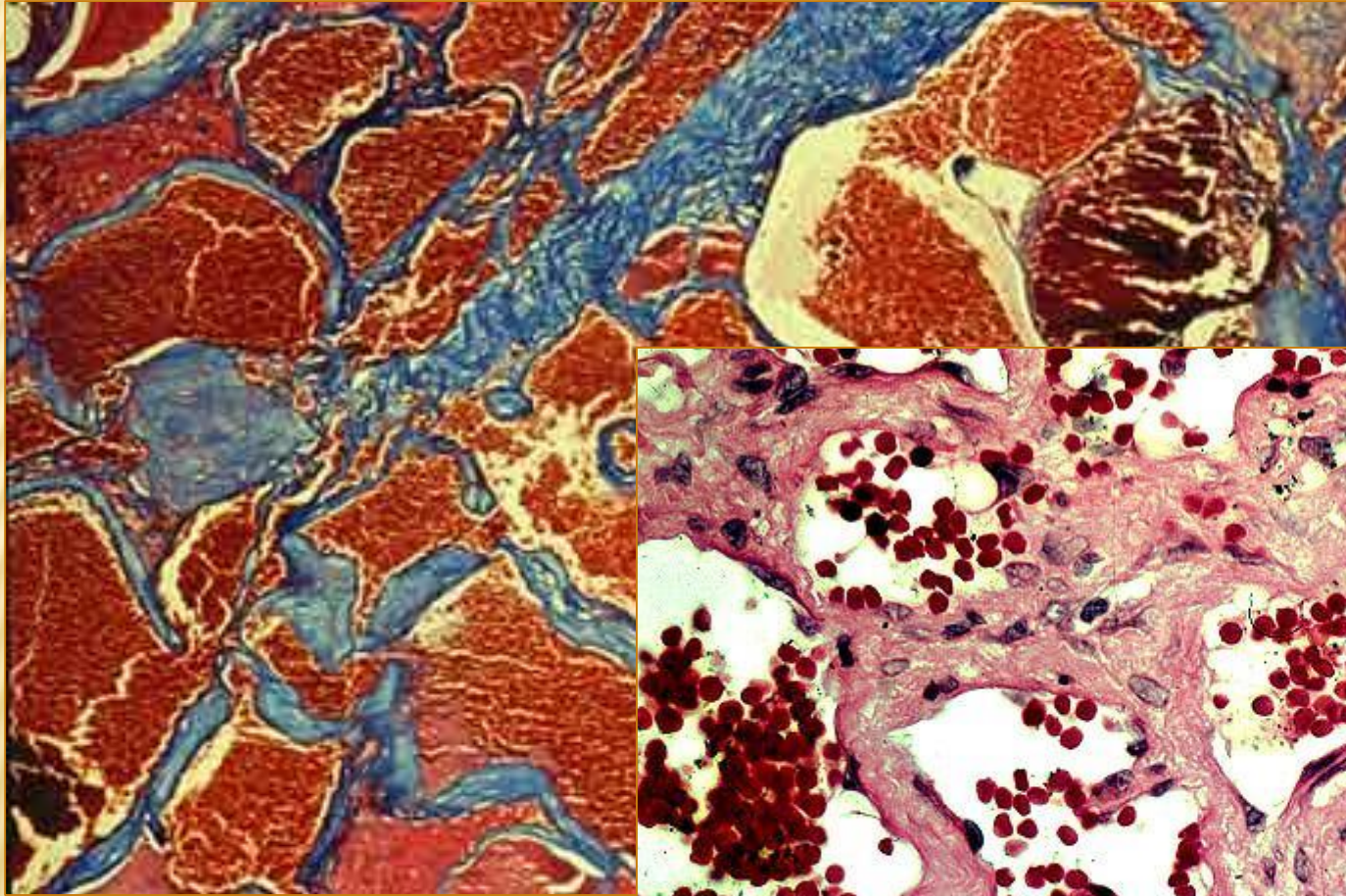
ASPECTOS PATOLÓGICOS

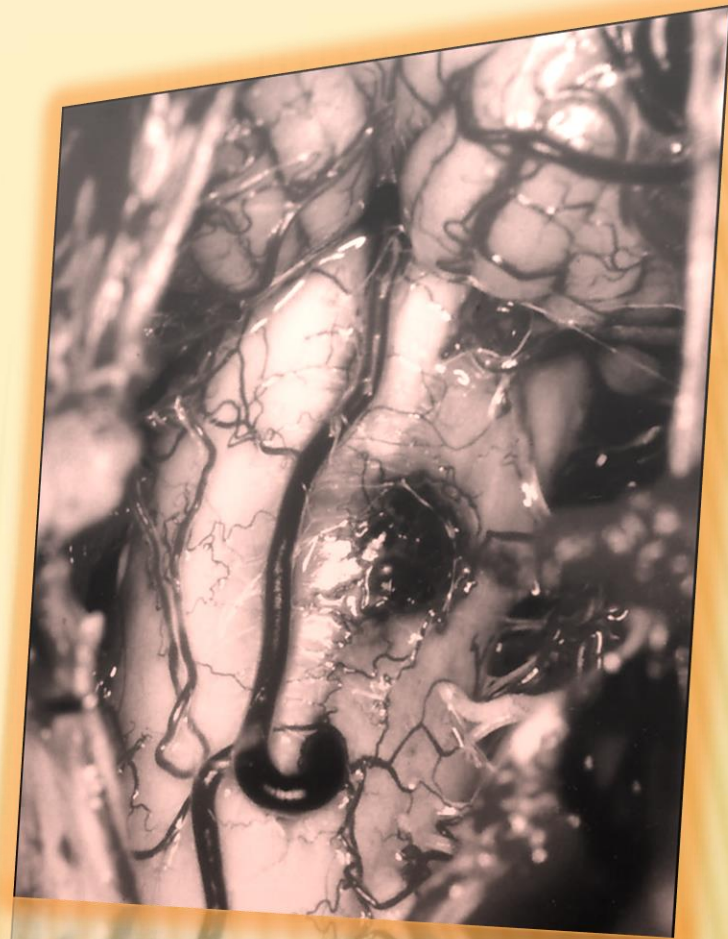
ASPECTOS PATOLÓGICOS

- ✘ Confusión morfológica
- ✘ Canales vasculares
- ✘ Parénquima
- ✘ Paredes de colágeno
- ✘ Calcio y osificación
- ✘ Hemosiderina
- ✘ “Criptas” perivasculares



ASPECTOS PATOLÓGICOS





Malformaciones cavernosas

ASPECTOS QUIRÚRGICOS

ASPECTOS QUIRÚRGICOS.

- ✘ Lesiones que comprometen la pía
- ✘ Lesiones exofíticas
- ✘ Déficit neurológico progresivo
- ✘ Efecto de masa significativo
- ✘ Hemorragia por fuera de la capsula

Johnson EW, Marchuk DA, Zabramski JM: The genetics of cerebral cavernous malformations, in Winn HR (ed): **Youmans Neurological Surgery, ed 5. Philadelphia: Saunders, 2004, Vol 2, pp 2299-2304**

- ✘ Presentaciones que comprometen la vida: coma, inestabilidad respiratoria o cardiovascular

Wang CC, Liu A, Zhang JT, Sun B, Zhao YL: Surgical management of brain-stem cavernous malformations: report of 137 cases. **Surg Neurol 59:444-454, 2003**

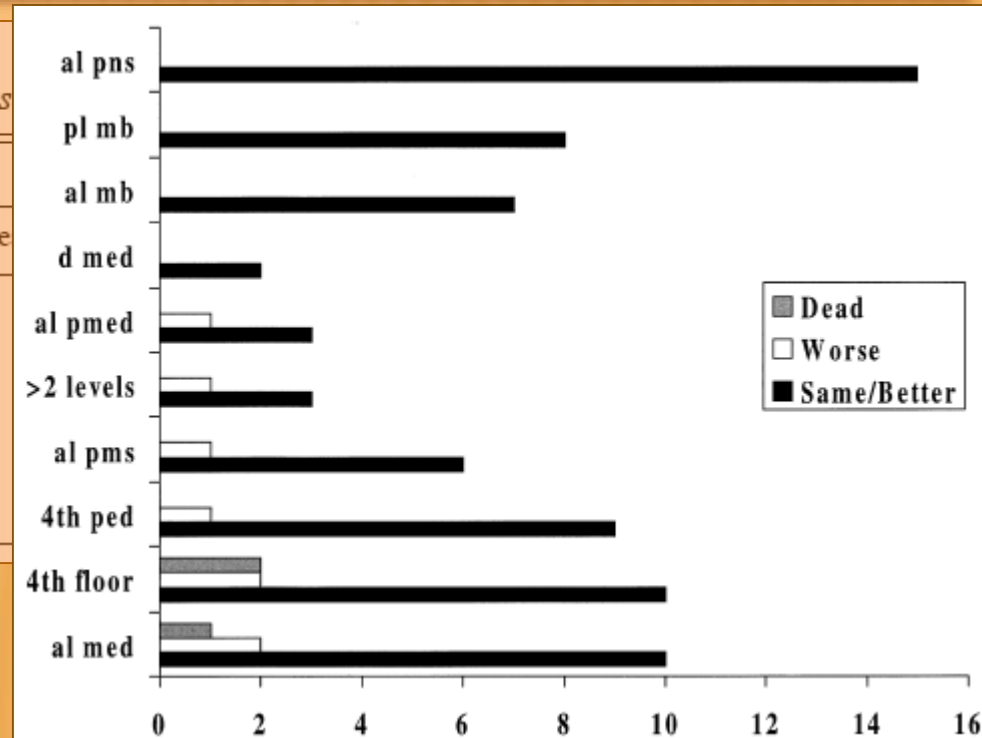
ASPECTOS QUIRÚRGICOS

- ✘ Suboccipital , Far-lateral, Orbito-cigomático, Supracerebeloso-infratentorial, Retrosigmoideo, Retrolaberintico, Subtemporal, Pterional, Translaberintico, Transcoclear, Occipital interhemisférico

TABLE 1

Surgical series of cavernous malformations of the brains

Authors & Year	No. of Patients	
	Total	Surgically Treated
Bertalanffy, et al., 1991	15	13
Fahlbusch & Strauss, 1991	20	10
Zimmerman, et al., 1991	24	16
Fritschi, et al., 1994	15	9
Sathi, et al., 1996	50	23
Amin-Hanjani, et al., 1998	14	14
present series	100	86



ASPECTOS QUIRÚRGICOS

✘ Niños con mayor expectativa de vida

Di Rocco C, Iannelli A, Tamburrini G: Cavernous angiomas of the brain stem in children. *Pediatr Neurosurg* 27:92-99, 1997

✘ Peores resultados que en adultos

Porter RW, Detwiler PW, Spetzler RF: Infratentorial cavernous malformations, in Winn HR (ed): *Youmans Neurological Surgery*, ed 5. Philadelphia: Saunders, 2004, Vol 2, pp 2321-2339

✘ 5 reportes con muy buenos resultados

Di Rocco C, Iannelli A, Tamburrini G: Cavernous angiomas of the brain stem in children. *Pediatr Neurosurg* 27:92-99, 1997

RESULTADOS

✘ Escala de resultado G.: 4,38 → 4,53

✘ 5/42, 4/36, 3/7, 2/1

✘ Tasa de complicaciones: 35% (30)

✘ Déficit permanente: 12% (10)

+ Déficit de pares (6)

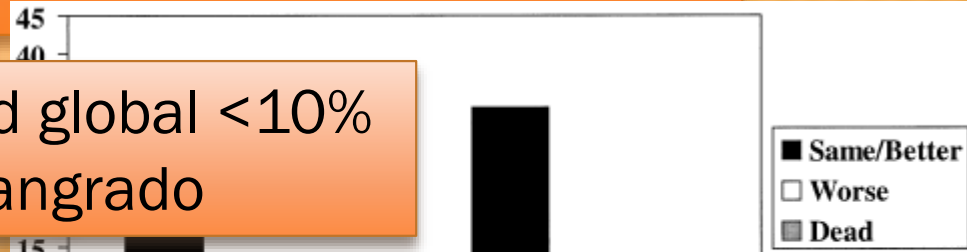
+ Aumento déficit motor (2)

+ Plexopatía (1)

+ Traqueostomía y gastrostomía 1

106 ptes quirúrgicos. Morbilidad global <10%

Déficit mayor o permanente x sangrado



Cavernous malformations of the brainstem: experience with 100 patients.. Porter RW. M.D., Detwiler P. W, M.S., M.D., Spetzler R F, M.D., Lawton M T, M.D., Baskin, David Netuka, (Czech Republic) DerksenJJ, M.D., PT., Zabramski J M, M.D. J Neurosurg 90:50-58, 1999

Long-term Results after Stereotactic Radiosurgery for Patients with Cavernous Malformations

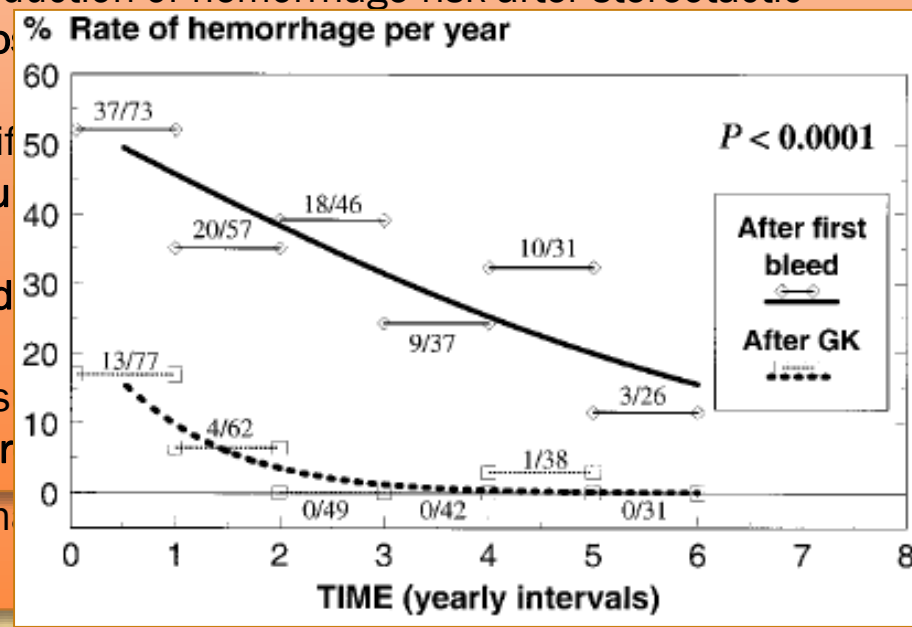
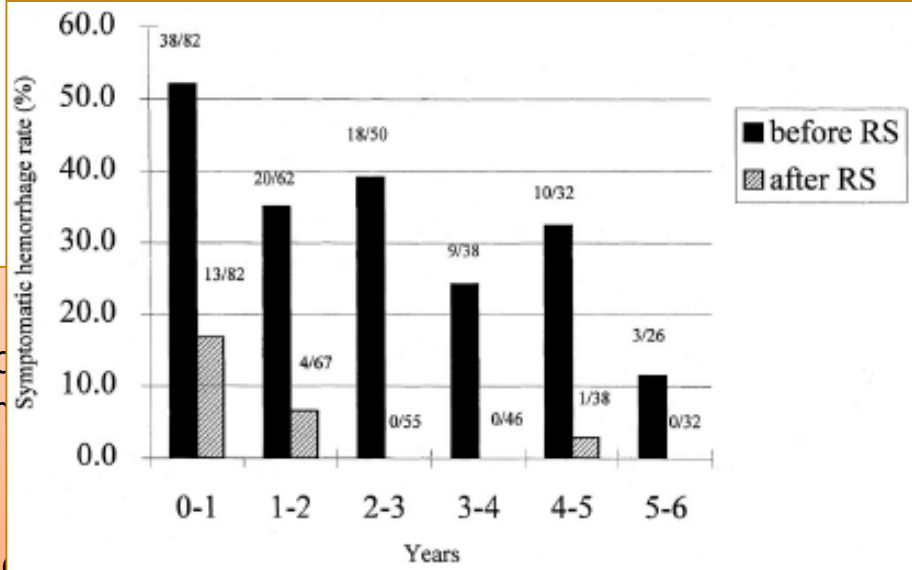
Toshinori Hasegawa, M.D., James McInerney, M.D.,
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TABLE 1. Characteristics of 82 Cavernous Malformations Selected for Radiosurgery

Factor	No.
Location	
Pons	26
Midbrain	19
Thalamus	9
Medulla	7
Temporal lobe	6
Parietal lobe	5
Basal ganglia	4
Frontal lobe	4
Cerebellum	1
Occipital lobe	1
Number of prior hemorrhages	
1	6
2	52
3	12
4	6
5	5
7	1



CONCLUSIONES

- × Masas vasculares compactas
- × Se presenta más en adultos y supratentoriales
- × 9% al 15% comprometen el tallo cerebral
- × Evolucionan, crecen.
- × Tasa de sangrado de 5% anual
- × Cirugía como primera línea
- × Radiocirugía no ha demostrado utilidad terapéutica