AJNR

Intracavernous carotid aneurysm associated with proptosis in a 13-month-old girl.

M Banna and P Lasjaunias

AJNR Am J Neuroradiol 1991, 12 (5) 969-970
http://www.ajnr.org/content/12/5/969.citation

Intracavernous Carotid Aneurysm Associated with Proptosis in a 13-Month-Old Girl

Mohamed Banna[1] and Pierre Lasjaunias[2]

Aneurysms of the cavernous portion of the internal carotid artery account for 3% to 5% of all intracranial aneurysms. They are more common in women 50–60 years old and frequently accompany ophthalmoplegia caused by compression of the third, fourth, and sixth cranial nerves. These aneurysms may cause visual loss, cerebral ischemia, Horner syndrome, trigeminal pain, or facial sensory loss. Rarely, they may rupture, leading to subarachnoid hemorrhage, carotico-cavernous fistula, or epistaxis. Few may be associated with headaches, and small aneurysms may be entirely asymptomatic [1]. We present a most unusual case of a cavernous sinus aneurysm occurring with proptosis in a 13-month-old girl.

Case Report

A 13-month-old girl was brought to the eye hospital because of progressive proptosis of the right eye of approximately 4 months duration. The child was the product of normal delivery and there was no history of trauma. She had a chest infection, complicated by pneumothorax, in the postnatal period, which was treated successfully. Her chest radiograph at the time of presentation was normal.

On examination there was mild proptosis of the right eye with limitation of upward gaze. The conjunctiva was congested and there was diffuse haziness of the cornea, dilatation of the right pupil, and slight pallor of the optic disk. The left eye was normal.

A CT scan of the orbits showed an enhancing dumbbell-shaped mass partly within the orbit and partly within the middle cranial fossa, straddling the superior orbital fissure (Fig. 1A). An angiogram showed the mass to be an aneurysm of the internal carotid artery originating from the carotid siphon proximal to the ophthalmic artery (Fig. 1B). Because the aneurysm was not surgically accessible, it was decided to treat it by endovascular carotid occlusion.

Under general anesthesia, a 5-French catheter was introduced into the right femoral artery by the Seldinger technique. Bilateral carotid and vertebral angiography confirmed a patent circle of Willis. The right internal carotid artery was then occluded by means of a 16-Gold-valve balloon (Nycomed Ingenor, 70-72 rue Orfila, 75020 Paris, France). One balloon was detached proximal to the aneurysm, and a second at the carotid bifurcation. There was no neurologic complication from the embolization procedure. Angiography 5 days later showed adequate blood flow into the right hemisphere from the left carotid and the basilar artery, as well as partial thrombosis of the aneurysm (Fig. 1C). MR imaging confirmed thrombosis within the aneurysm (Fig. 1D). When the child was seen 4 months later, the proptosis had disappeared, but the decreased vision in the right eye had not improved. A follow-up MR examination showed thrombosis and shrinkage of the aneurysm (Fig. 1E).

Discussion

The interesting features about this unusual case are the age of the child, the location of the aneurysm, the aneurysm as a cause of proptosis, and the management of the patient.

Age. Fewer than 3% of intracranial aneurysms occur in children less than 15 years old, and of these very few present in the first two years of life [2–4]. Our patient was 13 months old and did not have any of the conditions that might be associated with aneurysms in the pediatric age group, such as coarctation of the aorta, polycystic kidney, collagen disease, tuberous sclerosis, or an apparent source of infection [4].

Location of aneurysm. Cavernous sinus aneurysms are exceedingly rare in children, but a few cases have been reported following infections [5], trauma [6, 7], and arterial dissection [8]. Our patient sustained no trauma and had no orbital infection.

Arterial aneurysm as a cause of proptosis. Aneurysms of the ophthalmic artery are an exceedingly rare cause of proptosis, but cavernous sinus aneurysms commonly occur with ophthalmoplegia [1]. To our knowledge, a cranioorbital aneurysm of the type seen in the present case has not been reported. We speculate that it is probably a congenital anomaly occurring at a weak junction between segments of the developing embryonic carotid artery [9].

Management. In an ideal situation, trapping of the aneurysm is the most appropriate treatment of carotid cavernous aneurysm. This was not technically possible in this 13-month-old child. Furthermore, owing to the large size of the aneurysm, trapping carried an additional risk of occluding the posterior communicating artery. With a patent circle of Willis and such a young child, it was judged safe to occlude the internal carotid artery. By reducing the blood flow within the aneu-

Received September 12, 1990; revision requested December 8, 1990; revision received March 26, 1991; accepted April 22, 1991.
[1] Department of Radiology, King Faisal Specialist Hospital, P. O. Box 3354, Riyadh 11211, Saudi Arabia. Address reprint requests to M. Banna.
[2] Hopitaux de Paris, Centre Hospitalier de Bicetre, Paris, France.

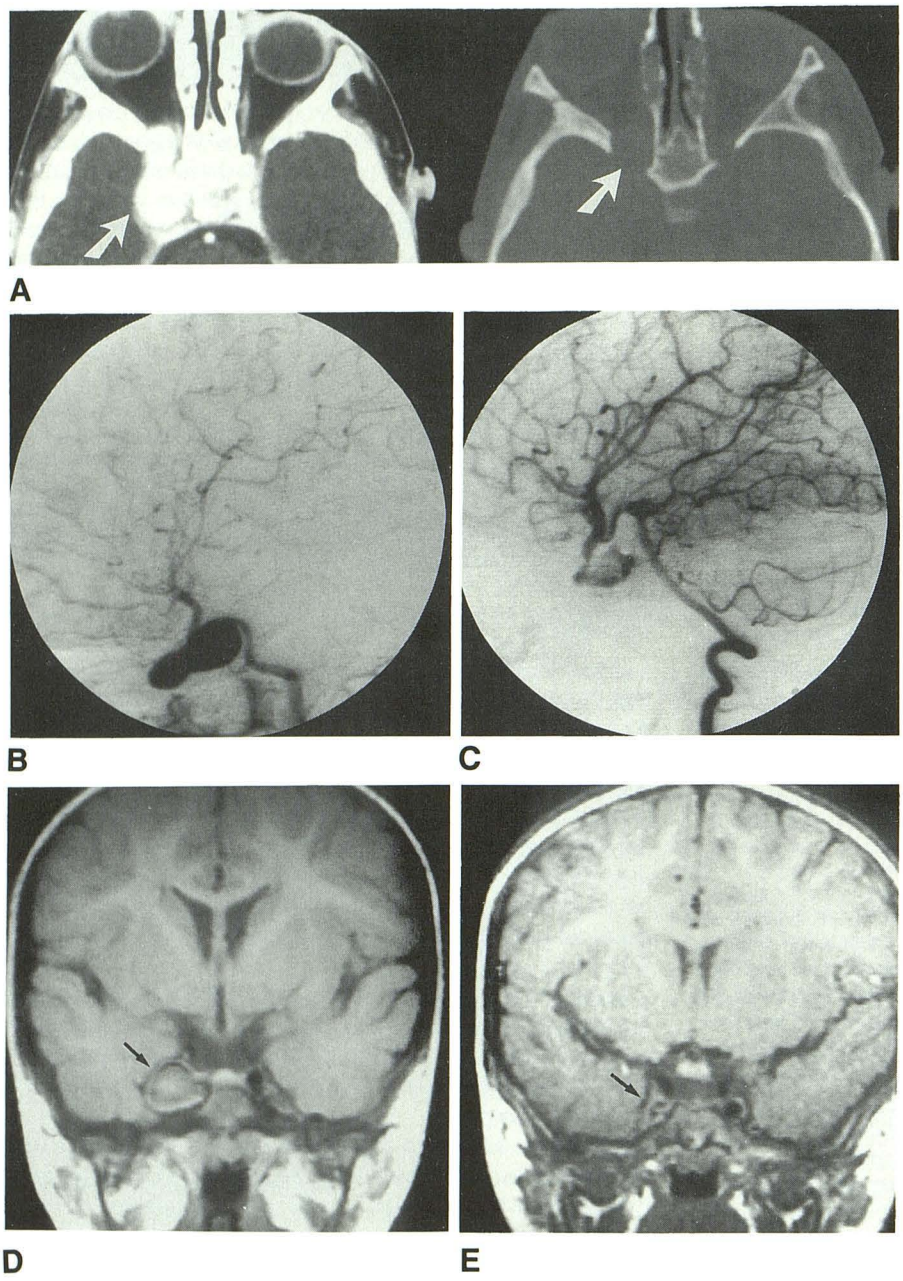

Fig. 1.—13-month-old girl with progressive proptosis of right eye of approximately 4 months duration.

***A*, CT scan through orbits. Soft-tissue and bone window settings show enhanced dumbbell-shaped mass partly within right orbit and partly within middle cranial fossa associated with enlargement of superior orbital fissure (*arrows*).**

***B*, Right carotid angiogram, lateral view, shows large dumbbell-shaped aneurysm arising from carotid siphon within cavernous sinus.**

***C*, Left vertebral angiogram shows adequate filling of right internal carotid artery through posterior communicating artery.**

***D*, Coronal T1-weighted (600/20/2) MR image obtained 5 days after balloon embolization shows complete clotting of aneurysm (*arrow*).**

***E*, Coronal T1-weighted (600/20/2) MR image obtained 4 months after embolization shows shrinkage of aneurysm (*arrow*).**

rysm, it was anticipated that progressive thrombosis and ultimately fibrosis would occur. In our experience, the possibility of embolic complications constituted a risk we had to take; fortunately, none occurred.

REFERENCES

1. Linskey ME, Sekhar LN, Hirsch W Jr, Yonas H, Horton JA. Aneurysms of the intravenous carotid artery: clinical presentation, radiographic features, and pathogenesis. *Neurosurgery* **1990**;26:71–79
2. Peerless SJ, Nemoto S, Drake CG. Giant intracranial aneurysms in children and adolescents. In: Vinken PJ, Bruyn GW, eds. *Handbook of clinical neurology*, vol 35. Amsterdam: North-Holland, **1972**:255–258
3. Roche JL, Choux M, Czorny A, et al. L'Aneurysme arterial intra-cranien chez l'enfant, etude cooperative. A propos de 43 observations. *Neurochirurgie* **1988**;34:243–251
4. Gum GK, Nadell JA, Numaguchi Y, Robinson AE. Giant aneurysms of bilateral internal carotid arteries in a child. *Child Nerv Syst* **1988**;4:161–163
5. Rout D, Sharma A, Mohan PK, Rao VR. Bacterial aneurysms of the intracavernous carotid artery. *J Neurosurg* **1984**;60:1236–1242
6. Chambers EF, Rosenbaum AE, Norman D, Newton TH. Traumatic aneurysms of cavernous internal carotid artery with secondary epistaxis. *AJNR* **1981**;2:405–409
7. Braun J, Gdal-On M, Goldsher D, Borovich B, Guilburd JN. Traumatic carotid aneurysm secondary to cavernous sinus penetration by wood: CT features. *J Comput Assist Tomogr* **1987**;11:525–528
8. Banna M, TerBrugge K, Lasjaunias P, Fournier D. Embolization of petrocavernous dissecting aneurysms. *J Can Assoc Radiol* (in press)
9. Lasjaunias P, Berenstein A. *Surgical neuro-angiography*, vol 1. *Functional anatomy of craniofacial arteries.* Berlin: Springer-Verlag, **1987**:4–8