Spontaneous regression of an extra- and intracranial arteriovenous malformation

Case report

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The authors report a case in which an arteriovenous aneurysm located partly extracranially and partly in the posterior cranial fossa disappeared within 15 months without bleeding episodes or surgical intervention. The patient's clinical symptoms, headache, and cranial bruit, disappeared completely over the same period.

Key Words: arteriovenous malformation, external carotid artery, pregnancy, spontaneous regression

Arteriovenous malformations (AVM's) with a predominant external carotid blood supply and partly or totally intracranial localization have been reported previously. Angiographically demonstrated spontaneous regression of this type of AVM has never been reported. We are documenting the angiographic findings in a woman with an AVM, located partly intracranially, with predominantly external carotid contribution, which regressed over a period of 15 months.

Case Report

In October, 1973, a 23-year-old woman was admitted with a 1-year history of an intracranial whistling bruit, and attacks of slight, throbbing, diffuse headache occurring after physical effort and lasting for a few hours. Cranial and orbital auscultation revealed a low-frequency, whistling bruit of varying loudness, synchronous with the pulse.

Neurological examination, ophthalmoscopy, and plain skull films were all normal. Direct right carotid arteriography (Fig. 1 left) was followed a few days later by selective catheterization of the vertebral arteries (Fig. 1 right). Both angiograms demonstrated an AVM located partly extracranially and partly intracranially behind the foramen magnum. The largest arterial branches originated from the right occipital artery and directly from the intradural part of the left vertebral artery. The AVM was drained by a large vein to the torcular. Since the patient was in the seventh month of her first pregnancy, she was discharged without any treatment.

On January 17, 1974, her pregnancy was terminated by elective hysterotomy. She gave...
Spontaneous regression of AVM

FIG. 1. Arteriograms taken at first admission. Left: Right carotid angiogram shows a large malformation in the occipital region. Right: Left lateral vertebral angiogram shows the same malformation. Note feeding vessels from the right external carotid and from the intradural part of the left vertebral artery.

birth to a normal boy. Twelve weeks later the patient started hormonal contraceptives (Nonovul, and later Neogentrol).* Nine months after delivery she experienced an alteration of the bruit, which now became gradually more high-pitched. Within 2 weeks the bruit disappeared completely.

The patient was readmitted in January, 1975. She had then been free of headaches for 6 months and without intracranial bruit for 2 months. Cranial and orbital auscultation revealed no bruit. Neurological examination and ophthalmoscopy were both normal. Bilateral external carotid arteriography and bilateral vertebral arteriography were performed by selective catheterization. The angiograms (Fig. 2) revealed that the AVM had disappeared. The caliber of the left vertebral and the right occipital artery had diminished. Small residual arteries from the central part of the right occipital artery and small irregularly shaped meningeal branches from the left vertebral artery were seen. The left external carotid angiogram and the right vertebral angiogram were both normal. The patient was discharged untreated. She was advised not to continue the oral contraceptive. In November, 1975, the patient still had no complaints of headache or bruit.

Discussion

A clinically useful classification of AVM must be based upon the localization of the angioma and upon the radiographically demonstrated anatomy of the feeding and draining vessels.* In our case, the AVM was located in the right occipital region and partly intracranially in the right side of the posterior cranial fossa. The vascular supply originated predominantly from the right external carotid and both vertebral arteries. The venous drainage consisted of several veins directed

*Nonovul's chemical composition is ethinylestrenol, 2.5 mg, and mestranol, 0.075 mg. Neogentrol's chemical composition is ethinylestradiol, 0.05 mg, and (d)-norgestrol, 0.25 mg.
FIG. 2. Arteriograms taken at second admission 14 months later. Left and Center: Right lateral external carotid angiograms. Right: Left lateral vertebral angiogram. Note disappearance of the malformation and diminished filling of branches from right occipital and left vertebral artery.

toward the torcular. In a survey including 125 cases of AVM only seven cases belonged to this category. Another series of 129 cases of intracranial AVM included nine cases of infratentorial, dural AVM. The AVM in question is thus a rare anomaly. A recent review lists the findings in 96 cases of AVM in the region of the transverse sigmoid sinus. In 67% of 92 recorded cases a cranial bruit was the main symptom and in 47% it was the first symptom. In the same survey, headache was the main symptom in 50%, and the first symptom in 18%. Plain skull films did not show important changes in most studies. The clinical and radiological appearance of our patient is thus in accordance with earlier experiences.

Spontaneous regression in size of an intracranial AVM without bleeding episodes, intervening carotid ligation, or x-ray therapy has only been reported once; the patient in that case had an AVM in the left frontoparietal region, which could not be angiographically recognized 21 years later. The disappearance of AVM has hypothetically been ascribed to thrombosis following previous hemorrhagic episodes. We have no indication of the underlying cause of regression in our case. Neither can it be decided with any certainty what role was played by the oral contraceptives. The relationship between AVM and pregnancy has recently been investigated in a retrospective survey concerning 146 patients. It was concluded that pregnancy should be terminated by elective lower caesarean section at the 38th week of gestation, and that concomitant sterilization should be considered because further pregnancies were risky for both mother and fetus. Our report gives no reason for changing this policy.

References
Spontaneous regression of AVM


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