THROMBOSIS OF AN INTRACRANIAL ANEURYSM AND CERVICAL PORTION OF THE INTERNAL CAROTID ARTERY IN A CHILD

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Thrombosis of the internal carotid artery in a child represents a rare clinical entity. An even rarer event is thrombosis of the carotid artery subsequent to thrombosis of an intracranial aneurysm of the internal carotid artery. Such a sequence has prompted us to submit this report for publication.

CASE REPORT

Mary Hitchcock Memorial Hospital #160795, C. H., an 11-year-old girl, was admitted to the hospital as an emergency. She had bilateral frontal headaches each Sunday for 2 months which were relieved when she was told that she need not go to school. For 11 days prior to admission she had a headache behind the right eye that had become severe. Because of lethargy, headaches, and restlessness, a physician was consulted, but no hospitalization was advised. Three days before admission, swelling of the face and both eyelids was noted. She complained of diplopia. An ophthalmologist advised hospitalization for a droopy right eyelid. The family and past medical histories were noncontributory.

Examination. The child was quite lethargic, but responded to painful stimuli. Her pulse rate was 68, blood pressure was 110/74, and respiratory rate was 18. She was not incontinent. The right eye appeared slightly protosed and there was complete paralysis of the 3rd nerve. Her neck was supple. The left foot was weak in dorsiflexion, but there was no extensor plantar response or clonus. The ophthalmodynamometric readings were 52/30 on the right and 78/35 on the left.

Roentgenograms of her skull and optic foramina showed elevation and shortening of the right anterior clinoid process with gross enlargement of the right optic foramen. The radiologist believed an optic nerve glioma accounted for these findings. Roentgenograms of the chest were normal. Initial hemoglobin was 14.1 gm. per cent, hematocrit was 44 per cent, count of white blood cells was 12,000 and sedimentation rate was 40 mm. per hour. Urine was normal, and specific gravity was 1.007. Lumbar puncture showed an opening pressure of 185 mm. of water; the fluid was clear, no cells were found and the protein level was 11 mg. per cent. Percutaneous right carotid arteriography showed good filling of the external carotid and vertebral systems, but no filling of the internal carotid artery. A ventriculogram was judged to be normal.

Operation. With this confusing picture, a right frontal craniotomy was elected to explore the region of the sella and right optic nerve. A nonpulsating mass was visualized lateral to the carotid artery near the optic foramen. An 18-gauge needle was inserted into the mass and no blood was encountered. A small incision was made into the mass and an old clot was found and removed. Shortly thereafter, the mass pulsed and very vigorous arterial bleeding was encountered. The mass was packed with Gelfoam and sutured. The neck of the mass was clipped, with cessation of its pulsation. The carotid artery was seen not to pulsate. After the craniotomy was completed, an incision over the right internal carotid artery disclosed a thrombosis of the vessel.

Postoperatively, the patient was supported with cortisone and small amounts of Pitressin for a transient period of diabetes insipidus. She responded well after 5 days of stupor and lethargy and was discharged from the hospital on her 10th postoperative day.

One year later, after several reevaluations in the outpatient clinic, she was found to be in excellent health, doing well at school, and having only a slight paresis of the right 3rd nerve as her only residual neurological finding.

DISCUSSION

The literature of the past decade has stressed the importance of the cervical portion of the carotid and vertebral vessels as far as the performance of the brain is concerned. In contrast to previous concepts, it is now realized that the cervical circulation must be maintained in order to allow for proper cerebral function. However, little has been recorded about the vulnerability of the cervical circulation to abnormal events occurring in the cerebral circulation. One is likewise startled by the very young age of this patient with these events.

Certain isolated cases have suggested this possibility in the past. Johnson and Walker, in their extensive discussion about spontaneous thrombosis of the carotid arteries stated, "Several authors have suggested the possibility of retrograde thrombosis from an intracranial aneurysm." These reports are few. Two early reports of Sorgo and Govons and Grant indicated that subarachnoid hemorrhage from an intracranial aneurysm of the carotid artery could complicate or cause an occlusion of the internal carotid artery, but in neither case was an aneurysm actually demonstrated. In Case 3 of James' series, the patient had a subarachnoid hemorrhage with a rapid hemiplegia. A right temporal burr hole disclosed a 15 cc. intracerebral clot following which a carotid arteriogram demonstrated a complete obstruction of the right internal carotid artery one inch from its origin. James stated, "In this case, it seems reasonable to as-
sume that the thrombosis originated at the site of the rupture of an intracranial aneurysm—the thrombus subsequently spreading downwards into the main arterial trunk. . . I have been unable to find in the literature a case similar to Case 3. Here there is no doubt that the thrombosis followed the rupture of a congenital aneurysm. It is possible that an aneurysm may be responsible in those cases with an apoplectic onset."

Le Beau et al.," in the same year, presented the case of a 46-year-old female who had ophthalmoplegia of the left eye involving the 3rd and 6th cranial nerves. The authors believed that the patient had an aneurysm of the internal carotid artery. Both percutaneous and open arteriography disclosed a stenosis and complete obstruction of the internal carotid artery just beyond the bifurcation. Their comments were interesting. They believed the obstruction of the artery did not rule out a carotid aneurysm and were confused by the fact that no patient with thrombosis of the carotid artery had isolated ophthalmic symptomatology without other associated neurological deficit. Johnson and Walker's comments about the etiology of thrombosis of the carotid arteries are also interesting. "In 1 of our cases the patient had a sudden onset of his illness and a bloody spinal fluid. There have been instances reported in which at autopsy an aneurysm was found occluding the internal carotid. . . While an aneurysm has not been demonstrated in any of the 107 cases, it is conceivable that it might be an etiologic factor in some instances."

Humphrey and Newton recently reported 2 cases of occlusion of the carotid artery in young adults accompanied by an intracranial aneurysm. In their Case 5, a 37-year-old man had a palsy of the right 2nd, 5th and 6th cranial nerves with a partial right Horner's syndrome. On the roentgenogram of the skull there was an oval calcification behind the right orbit thought to represent a carotid aneurysm. Arteriography demonstrated thrombosis of the internal carotid artery 1.5 cm. distal to its origin.

In their Case 9, however, a 32-year-old woman had a subarachnoid hemorrhage and arteriography demonstrated a complete occlusion of the internal carotid artery at the siphon just distal to the origin of the posterior communicating artery. They presumed that an aneurysm had caused the subarachnoid bleeding.

Our case is most unique. In the first place, aneurysms of the circle of Willis rarely become symptomatic before the age of 12, as is confirmed by the fact that in Ingraham and Matson's personal experience, they have demonstrated an aneurysm by arteriography in only 1 case. Secondly, the aneurysm had expanded sufficiently to erode the optic foramen and later thrombose, not only itself, but the proximal portion of the internal carotid artery.

Our vigorous surgical approach of the problem indicated our great concern about the possibility of parasellar pathology other than aneurysm. We were indeed surprised by our findings despite certain important cues, such as the ophthalmodynamometric differences and the thrombosis of the carotid artery by arteriographic findings.

**SUMMARY**

1. A case of infracranial carotid aneurysm in an 11-year-old girl with a spontaneous thrombosis of the aneurysm and proximal internal carotid artery is presented.

2. The untoward effect of disturbances of the cerebral upon the cervical carotid circulation is discussed.

**REFERENCES**


