Intracranial Arterial Aneurysm in a Three-Month-Old Infant
Case Report

P. M. VAPALAHTI, M.D., P. SCHUGK, M.D., LEENA TARKKANEN, M.D., AND G. AF BJÖRKESTEN, M.D.
Neurosurgical Clinic, University Central Hospital, Helsinki, Finland

Primary subarachnoid hemorrhage does not often occur in childhood, and an arterial aneurysm as its cause is even more rare. In their series of 1125 intracranial aneurysms compiled from the literature before 1938, McDonald and Korb found 30 children (1.5%), 13 of whom had a mycotic and 17 a true saccular aneurysm. In later published series from different neurosurgical centers the percentage of children has been around 1%. At this hospital, among 688 patients with angiographically verified arterial aneurysms, Laitinen (1962) found nine children (1.3%) under 15 years of age. In Pakarinen's unselected series of 554 patients with primary subarachnoid hemorrhage from the city of Helsinki (1967) 363 had arterial aneurysms but only two were under 10 years. In 1965 Matson published a series comprising 13 children with arterial aneurysms over a 12-year-period, most of whom were successfully operated on.

Only a few children from the earlier reports were under 2 years of age, and in most cases the diagnosis was made postmortem. The youngest patient in the series of McDonald and Korb was 18 months. The youngest aneurysm patient ever reported was a boy (Newcomb and Munns) who died at the age of 64 hours from a rupture of an arterial aneurysm on the posterior communicating artery. Forster and Alpers reported the case of an infant who died at 13 weeks from a polycystic disease of the kidneys, and who in addition, had a small, unruptured, arterial aneurysm on the basilar artery. Jänisch reported an 8-week-old infant whose aneurysm proved to be mycotic. Lemen and Schneider reported an 8-month-old infant with an intracranial intraventricular aneurysm. Pool and Potts published a report on an 11-month-old infant, and Jane on a 12-month-old boy, the former with an aneurysm of the middle cerebral and the latter with an aneurysm of the posterior inferior cerebellar artery.

There have been only four cases reported in which an arterial aneurysm has been diagnosed during life in an infant under the age of 2 years; three of these had successful operations. In 1960, Kimbell, et al., reported the first successful operative treatment after angiographic diagnosis of an aneurysm of the right middle cerebral artery in a 16-month-old infant. The youngest to be operated on was a 4-week-old girl, reported by Jones and Shearbun in 1961; the aneurysm was situated on the right middle cerebral artery. Matson's series includes two infants: one, age 1 year 11 months, was successfully operated on for an aneurysm of the posterior inferior cerebellar artery; the other, age 16 months, was operated on for a similar aneurysm but was moribund and died a few days later.

Our own case is a 3-month-old girl who, after a subarachnoid hemorrhage, was angiographically examined and operated on successfully. The source of bleeding was a large aneurysm of the right middle cerebral artery.

Case Report

The patient was a girl, born November 18, 1967, the first child in the family. The father had suffered from diabetes since childhood; the mother was healthy. The pregnancy was normal, but delivery had to be completed by vacuum extraction. The birth weight was 4260 gm. The child appeared normal at birth, and apparently had a normal physical and mental development until 3 months of age when she suffered her present illness.

On the afternoon of February 18, 1968, the child suddenly vomited and became restless and pale; she cried, but was able to eat during the night. The next morning, however, she was semicomatose and was transferred to a pediatric department. She was

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found to have neck stiffness and a tense anterior fontanel; she was deeply stuporous. A lumbar puncture revealed hemorrhagic spinal fluid, and in a subdural puncture there was blood under pressure on the right side. The hemoglobin was under 8 gm, and a blood transfusion was performed. On February 20, she was conscious, but had a series of focal epileptic fits in the left arm and leg, and developed a left-sided hemiparesis. In the evening she was transferred to the Neurosurgical Clinic, Helsinki.

Examination. The patient was conscious at admission, but had continuous epileptic seizures in the left limbs; these were stopped by diazepam. The hemiparesis was quite serious and included a central paresis of the left facial nerve and paralysis of left lateral gaze. The fontanel was very tense, and she had papilledema with hemorrhages in both retinæ. On February 21, a right carotid angiography was performed by percutaneous puncture under halothane anesthesia. A rather large arterial aneurysm was found at the point of division of the posterior temporal and angular arteries. In addition, there was a large hematoma in the temporal lobe (Fig. 1). Urography showed normal kidneys.

Operation. On February 22, under halothane-oxygen anesthesia with hyperventilation in an Engström respirator, a right temporal craniotomy was performed. The hematoma was removed, and, in addition, a partial temporal lobectomy had to be performed because of the markedly increased intracranial pressure. The aneurysm was now easy to identify; a temporary clip was placed on the feeding artery, the neck of the aneurysm was closed with a silver clip, and the aneurysm was extirpated, after which the temporary clip was removed.

Postoperative Course. The child made a good and rapid recovery. The hemiparesis disappeared immediately after the operation, the gaze paralysis in a few days. A control angiographic study on February 29 showed that the aneurysm did not fill; there was no filling of the posterior temporal artery nor of the angular artery, perhaps because of thrombosis caused by the temporary occlusion during operation (Fig. 2). The patient left the hospital 2 weeks after the operation in good condition and 6 weeks later was well and developing normally. Under continued antiepileptic treatment there have been no fits since the operation.

Microscopic examination showed that the aneurysm was a true arterial one.

Discussion

The etiology of intracranial aneurysms has not as yet been definitely clarified. The theory of congenital embryonic defects in the media of the arterial wall, also verified in electron microscopy, is commonly accepted. The role of atherosclerosis and hypertension in the later development of aneurysms may at least partly explain why they are so seldom found in infants and children. External violence, such as the vacuum extraction in our case, can hardly play any part in the pathogenesis of aneurysms. The risk of recurrent hemorrhage in aneurysms in children