False Cerebral Aneurysm

Case Report

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Several well-documented examples of a false traumatic aneurysm of the middle meningeal and other intracranial arteries have been reported.\textsuperscript{2-6,8,9} Allegedly "true" saccular aneurysms occurring as a result of varied kinds of trauma have also been described.\textsuperscript{2,5,4,7,10} The purpose of this communication is to present the successful diagnosis and treatment of a traumatic false aneurysm of a cortical branch of the middle cerebral artery, and to discuss the relationship of trauma to the formation of false intracranial aneurysms while posing the question of whether indeed trauma plays any convincing part in the pathogenesis of the "true" saccular variety.

Case Report

This 2-year-old boy was admitted to a Children's Hospital on August 12, 1966, after falling some 20 feet from a bedroom window.

First Examination. Immediate examination revealed the presence of a "boggy" mass in the left parietal region and a right hemiplegia. The boy was unconscious but responded to painful stimuli. The pupils were medium sized and reacted sluggishly to light. Blood pressure was 100/65; pulse, 100 settling to 80; respirations, 25 per min. No other injuries were noted. Hemoglobin 65% and a transfusion of 200 ml of blood was given. Plain x-ray films of the skull disclosed multiple linear fractures with diastasis, and depression of a fragment in the left parietal region. During the next 12 days the child steadily improved so that by August 25 he was responding to his name and taking food. Since paralysis persisted and the mass in the parietal region had expanded, bilateral percutaneous carotid angiography was performed on August 26.

The peri-callosal arteries were displaced to the right while the left middle cerebral artery was considerably elevated and medially displaced together with its major branches. An aneurysmal cavity was filled with contrast medium via the posterior temporal branch of the middle cerebral artery and emptied very slowly. In the anteroposterior films, the middle cerebral branches appeared to be slightly displaced away from the cranial vault (Fig. 1). The bone fragments adjacent to the aneurysm which had previously been noted to be slightly depressed had now become elevated. The boy was transferred to the Neurosurgical Centre with a diagnosis of "false" aneurysm of the posterior temporal branch of the left middle cerebral artery, associated intracerebral hematoma, and superficial hematoma overlying the left parietal and temporal cortex.

Second Examination. On examination at the Neurosurgical Centre, the patient was found to be conscious but drowsy and inattentive and would not articulate. There was a fixed conjugate deviation of his eyes to the left and a right homonymous hemianopia. He had a right hemiplegia including facial weakness; the arm was affected more profoundly than the leg. Palpation of his head disclosed a large subgaleal left parietal mass, partly semi-solid and partly fluid.

Operation. On August 28, a left parieto-temporal scalp flap was reflected with the subgaleal mass in its center. This exposed a bulky herniation of the brain emerging from the wide horizontal fracture between the upturned parietal and temporal fragments and evertting upwards and downwards over these fragments. In addition to the brain, there was a substantial amount of semi-solid blood clot. The latter was aspirated. The upper fragment was converted into a small bone flap while some of the lower fragment was nibbled away. The dura around the herniating brain was adherent to it and had to be opened and dissected all round to free the
extrusion. While this was being done, a substantial fluid subdural hematoma was released. On opening the dura downwards, an aneurysmal structure on the surface of the brain was displayed with the artery entering and emerging from it. A clip was placed on either side, and the dome of this structure was removed. There was no formed "fun- dus" to this aneurysm but an enormous cerebral blood clot was lying deep to it. With suction, the clot was aspirated leaving a cavity replacing the posterior half of the temporal lobe and the lower region of the parietal lobe deep to the angular gyrus. The clot also filled the temporal horn of the lateral ventricle and when it was removed, there was a gush of cerebrospinal fluid from the body of the ventricle into the brain cavity. The herniating brain was now easily replaced without sacrificing any of it. The wound was closed in layers.

Pathological Report. Macroscopically, the tissue was made up of brownish blood clot 1 ½ cm in diameter which contained an "aneurysmal" sac 1 cm in diameter in which was firm, laminated blood clot. This sac was attached to a small artery 1 ½ mm in diameter which ran through the specimen.

Microscopically, there was a breach in the wall of the artery which was surrounded by blood clot. Immediately adjacent to the breach, the blood clot was organized and with young collagen fibres had formed a rather poorly defined sac. Within it the blood clot was laminated, and outside it the clot was more friable. The arterial wall and its internal elastic lamina were quite normal apart from the small area breached. Here, the elastic lamina ended abruptly and curled over slightly as though it had been torn. No elastic tissue was seen in the wall of the sac (Fig. 2).

The lesion was interpreted as a traumatic "false" aneurysm, with the wall of the sac formed by organized blood clot.

Postoperative Course. During the remaining months of 1966, the boy improved and gradual rehabilitation was continued. He was discharged to a special Residential Nursery on the last day of January 1967. At that time, he still had a right homonymous hemianopia. His eyes tended to deviate to the left but he had learned not to disregard the right side. He could use the right hand as a prop and with a below-knee caliper he raced around the wards. He could say many words and a number of short sentences.

Discussion

Radiology and Angiography. Unlike false aneurysms of the middle meningeal artery which opacify in a late stage of arteriography consistent with the normal disparity between the internal and external carotid circulations, the sac of the false aneurysm we have reported was demonstrated in the early