Case Reports

Traumatic Aneurysm of a Peripheral Cerebral Artery

Review and Case Report

CHARLES BURTON, M.D., FRANCISCO VELASCO, M.D., AND JERRY DORMAN, M.D.
Division of Neurological Surgery, The Johns Hopkins University School of Medicine, Baltimore, Maryland

Cerebral aneurysms due to trauma constitute a very small group. They usually involve the large basal arteries but also occur on the peripheral cerebral arteries.21 The identification of these lesions is a matter of the greatest urgency because most of them can be easily removed, whereas if they remain unrecognized and rupture, the associated mortality is high.

Case Report

A 14-year-old boy was brought to the accident room immediately following an auto accident in which he had been thrown from the front to back seat striking the right occiput. He was said to have been unconscious for 20 minutes.

Examination. Vital signs were normal, and the patient was alert and well oriented. Comminuted and depressed fragments of bone could be palpated through a 7–8 cm jagged laceration in the right occipital area. Funduscopic examination, visual acuity, and visual fields (confrontation) were normal. The remainder of the neurological and physical examination was normal. Skull x-rays verified the depressed and comminuted fractures of the right occipital and parietal bones.

First Operation. The occipital laceration was extended and exploratory craniectomy performed. The right transverse sinus was found to contain three large penetrating fragments of bone deeply imbedded in the sinus. Following their removal hemorrhage was controlled by finger pressure over gelfoam and paddies. Ligature of the sinus was not considered due to the possibility of total superior sagittal sinus drainage by this route. A new wall for the sinus was constructed from gel-foam and a fascia lata graft.

Postoperative Course. The patient regained normal consciousness and vision; the spontaneous central retinal vein pulsations noted on admission were still present. During the first few days the patient's only complaints were occasional dizziness and neck stiffness. On the third postoperative day spontaneous central retinal vein pulsations were no longer present and early blurring of the right disc margin was evident; a percutaneous right brachial arteriogram performed the same day showed an aneurysm of the temporo-occipital branch of the posterior cerebral artery although at the time it was considered normal except for partial obstruction of the right transverse sinus at the point of injury and repair.

The clinical course was stable until the sixth postoperative (and post-trauma) day when the patient suddenly sat up in bed, grasped his head in his hands, and began to shriek because of excruciating headache and then difficulty seeing. Within a few minutes he became lethargic and then comatose, with a pulse rate of 40. The occipital craniectomy site was noted to be bulging; a ventricular needle was passed transdurally through a small scalp incision and 5 cc of bloody fluid under pressure removed. Lumbar puncture revealed grossly bloody cerebrospinal fluid with an opening pressure of 230 mm H2O and a hematocrit of 3%. Following lumbar puncture the patient improved markedly, and his condition remained stable except for occasional episodes of projectile vomiting. Funduscopic examination revealed the absence of central retinal vein pulsations bilaterally, and 2 diopters of papilledema with flame hemorrhage on the right. Repeated lumbar punctures indicated progressive diminution of pressure and red blood cell content. A right brachial arteriogram repeated on the fourth post-hemorrhage day revealed a definite pea-sized aneurysm arising from the temporo-occipital branch of the posterior cerebral artery; it was now larger than in the
postoperative arteriogram performed 7 days previously (Figs. 1 and 2).

Second Operation. On the sixth post-hemorrhage (twelfth post-trauma) day the patient was reexplored through an occipital craniotomy. There was no significant hematoma. The aneurysm was located in an area of contused and scarred occipital cortex adherent to the lacerated transverse sinus; the aneurysm and feeding artery were obliterated by electrocautery.

Second Postoperative Course. The patient made a good recovery. No evidence of the aneurysm was seen on the third right brachial arteriogram performed 9 days after operation (Fig. 3). At the time of discharge the only neurological abnormalities were small left homonymous inferonasal quadrantic field defects and slight blurring of the right disc margin. One year after surgery the patient is well and neurologically intact.

Discussion

A review of related reports has produced only 10 cases sufficiently well documented to justify designation as a traumatic aneurysm of a peripheral cerebral artery. Table 1 presents a brief description of each case. With our case included, the over-all mortality is 54%. None of the cases cited, including our own has been adequately documented by pre-trauma, post-trauma, and postoperative arteriograms as well as operative confirmation and histologic review. Moreover, the possibil-

Fig. 1. Left: 6th post-trauma day. Right brachial arteriogram indicates early evidence of aneurysm (arrow). Right: 12th post-trauma day. Prominent pea-sized aneurysm has clearly developed on temporo-occipital branch of posterior cerebral artery (arrow).

Fig. 2. Anteroposterior simultaneous view of the aneurysm (12th post-trauma day).

Fig. 3. Postoperative right brachial arteriogram 9 days after removal shows no sign of aneurysm.