Case Reports and Technical Notes

Traumatic Aneurysm of a Cerebral Artery

Case Report

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The etiology of cerebral aneurysms is variable. They are customarily classified as mycotic, arteriosclerotic, or more commonly, congenital or developmental. The matter of congenital versus developmental or acquired remains controversial. It is generally agreed, however, that berry aneurysms, either congenital or developmental, occur as the result of defects in the tunica media and the internal elastic membrane of the cerebral vessels. The present report is concerned with an additional and less frequently recognized cause of aneurysms of the cerebral arteries, namely, trauma.

Case Report

This 61-year-old Latin American man, a recognized alcoholic, fell and struck his head on the floor of the city jail in November, 1967. Shortly afterwards he was admitted to the Robert B. Green Memorial Hospital in light coma, with an obvious left hemiparesis.

Examination. A large scalp hematoma was present in the right forehead region. Plain skull films were normal, and a right carotid angiogram revealed a subdural hematoma (Fig. 1).

Operation. Trehphination was performed under local anesthesia, and the hematoma, which was quite fresh, was evacuated. There was no remarkable cortical abnormality.

Postoperative Course. The patient steadily improved and was discharged to home care. He still had moderate residual confusion.

Second Examination. The patient returned to the hospital on December 14, 1967, 2 weeks following discharge, having had a major motor seizure which began locally in the left side of the face and left arm. Neurological examination revealed confusion and a mild left hemiparesis. There was no evidence of local or systemic infection. A repeat right carotid angiogram demonstrated a subdural hematoma, smaller in size than that on his first admission. In addition, there was now an aneurysm of a superficial cortical branch of the middle cerebral artery (Fig. 2 left).

Second Operation. A right frontotemporal craniotomy was performed, and a sizable old hematoma with membranes was encountered in the frontotemporal region. Directly under the old temporal burr hole was a small aneurysm measuring approximately 7 mm in diameter. It arose from a superficial branch of the middle cerebral artery. The aneurysm, along with its afferent and efferent vessel, was isolated, and the aneurysm resected between clips applied to the parent vessel.

Second Postoperative Course. The patient again had an uncomplicated recovery and was discharged to home care on the 14th postoperative day. He was markedly improved but still mildly confused.

Third Examination. The patient was admitted for a third time on February 26, 1968, because of another major motor seizure. Repeat angiography revealed no remarkable abnormality. The aneurysm was no longer present (Fig. 2 right). Because of residual confusion, an air study was performed. It revealed considerable enlargement of the ventricular system and the cortical sulci. No specific therapy was felt to be indicated. The patient has shown gradual improvement in sensorium since hospital discharge, but his behavior remains moderately inappropriate. We feel that the latter is probably related to central nervous system changes secondary to chronic alcoholism as well as recent trauma.

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Pathologic examination of the aneurysm revealed disruption of the internal elastic membrane in the parent vessel along with destruction of the tunica media. The wall of the aneurysm consisted primarily of fragmented collagenous tissue. There was a striking absence of an internal elastic membrane and media. Early organization of the thrombus was present (Fig. 3). Hematoxylin-eosin and gram stains of the specimen revealed no evidence of infection.

**Discussion**

The aneurysm that developed in this patient probably occurred as a result of an unrecognized injury to the tunica media and internal elastic membrane of the parent vessel at the time of initial trephination. The absence of an aneurysm by angiography and the normal appearance of the cortex and vessels at the initial surgical procedure support this point of view. An aneurysm of the size removed would have been recognized had it been present, since it lay directly beneath the burr hole. It is possible, however, that injury to the parent vessel wall occurred at the time of initial trauma with delayed aneurysm formation occurring after trephination.

The question of the relationship of the aneurysm to the second subdural hematoma arises. It is our feeling that the hematoma in this case was not causally related to the aneurysm. This judgment is based on the clini-