Dissecting Aneurysm of Middle Cerebral Artery

Case Report

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Dissecting aneurysms of the intracranial arteries are infrequent and less than 20 such cases have been described in the literature. These cases were reviewed thoroughly by Spudis et al. in 1962. In some instances trauma appeared to be an etiological factor. In others, congenital defects of the wall or syphillis were postulated as possible causes. In 4 cases the dissection was associated with necrosis of the media. This type of vascular lesion occurs in young adults, the mean age of the patients reviewed by Spudis et al. being 51, and the vessels most frequently involved are the middle cerebral arteries.

It is the purpose of this paper to report the case of a young girl who died from massive softening of the right hemisphere, following a dissecting aneurysm of the corresponding middle cerebral artery.

Case Report

T.A., a 20-year-old white female, was admitted to Notre-Dame Hospital on June 28, 1961. She always had been in good health until the evening before admission when she had a crying spell following an emotional trauma. After calming down she felt faint and later complained of numbness and tingling of the left side of her body. She vomited at midnight and again in the early hours of the morning.

Examination. The patient was restless but conscious and well oriented. She complained of intense headache on the right side. Temperature was 99°F., pulse rate 80, and respiratory rate 20 and regular. Blood pressure was 120/80. General physical findings were normal. Pupils were equal and reacted to light. Fundi were normal. There was anesthesias of the left side of the face with a left facial weakness of central type. The tongue was deviated to the left. There was some weakness and diminished sensibility of the left side of the body. Deep tendon reflexes were slightly increased on the left. Abdominal reflexes were absent on the left side. The left plantar reflex was equivocal and the right was flexor.

Urinalysis, blood findings and roentgenograms of the skull were normal. The cerebrospinal fluid was under normal pressure and contained 1 leucocyte per c.ml. Protein, sugar and chloride were in normal amounts.

Course. On June 29, the patient became increasingly somnolent. The pulse rate varied between 60 and 64 per min. Neurological signs remained unchanged. A right carotid arteriogram showed an abrupt ending of the right middle cerebral artery in an aneurysmal-like pouch approximately 2 mm. from its origin (Fig. 1, a).

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A linear vascular shadow emerged eccentrically from this formation, faintly outlining the distal part of the vessel over a short distance (Fig. 1, b). The branches of the anterior cerebral artery were shifted 3 mm. to the left of the midline. An electroencephalogram showed diffuse slowing of the cerebral activity but the abnormalities appeared maximum over the right temporoparietal regions where they took the form of continuous irregular 0.5 to 1 c./sec. high-voltage delta activity. An electrocardiogram was normal.

On June 30, the patient was in deep coma. Her pulse rate was 56. Blood pressure was 145/70. The right pupil was larger than the left and reacted slightly to light. On painful stimulation there was no response on the left side and the patient reacted with flexion of the right limbs. Later both pupils dilated and the patient died.

Autopsy was restricted to the brain. The convolutions of the right hemisphere were flattened and there was herniation of the uncus and the cerebellar tonsil on the right. There was massive recent softening of the right parietal, frontal and temporal lobes as well as of the basal ganglia in the territory of the middle cerebral artery. The right middle cerebral artery from its origin to its bifurcation was enlarged, firm and bluish, and on cut section was seen to be completely occluded. This occlusion extended into the 1st cm. of the temporal branch. There was no appreciable arteriosclerosis. No blood was found in the subarachnoid space. The vessels of the circle of Willis had a normal anatomical distribution. No saccular aneurysms were seen in the circle or in any of its branches.

Microscopic sections of the right middle cerebral artery at the site of occlusion revealed a large hematoma in the wall of the vessel. While most of the blood was fresh, early organization was found in some areas. The hematoma extended over approximately one-half of the circumference of the vessel. It had dissected under the intima, between the latter and the media, lifting the internal elastic lamina which otherwise appeared intact.

The remaining lumen was a narrow slit (Fig. 2). In one area fibrous thickening of the intima was found (Fig. 3).

Sections of the areas of softening showed changes typical of a recent infarct.

Discussion

Intramural hemorrhage with dissection and thrombosis between the intima and the media is a rare cause of cerebral infarction. We feel, however, that such a lesion should be thought of as a possibility whenever a young adult with no evidence of thrombo-embolic disease shows signs of a brain softening. With Spudis et al. we believe that occlusion of a cerebral vessel associated with discrete asymmetric filling of its distal portion...
Fig. 1. Right carotid arteriogram, anteroposterior projection, showing small aneurysmal-like pouch at the site of occlusion (a). The distal portion of the middle cerebral artery (b) arises eccentrically from this formation as a faint linear shadow. The small vessel (c) probably represents the origin of the ascending frontoparietal branch.

may well represent a diagnostic angiographic picture. The asymmetric filling is the result of the fact that the remaining slit-like lumen appears displaced to one side. We are not certain as to the interpretation of the pouch formation seen in the arteriogram. Although we are unable to prove it with our histological material, this may perhaps represent a point of tearing of the inner elastic membrane. The peculiar frequency of involvement of the middle cerebral artery should be kept in mind.

The pathogenesis of dissecting aneurysms of the cerebral vessels remains obscure. The dissection is most often subintimal and thus differs from aortic lesions which occur in the media of the vessel.

Summary

A case of dissecting aneurysm of the right middle cerebral artery in a 20-year-old girl is presented. Although this type of lesion is rare, it should be considered when a diagnosis of cerebral infarction is made in a young adult with no apparent cause for thrombosis or embolization.

References

Fig. 2. (left). Low-power view of right middle cerebral artery. A blood clot extending over approximately half the circumference of the vessel is seen. It has dissected between the intima and the media. The remaining lumen is reduced to a slit. (Hematoxylin and eosin, ×60)

Fig. 3 (right). Detail of dissection. The thrombus (th) is between the media (m) which is intact and the internal elastic lamina (e). Adjacent to the area of dissection the intima shows fibrous thickening (i). (Hematoxylin and eosin, ×100)


