A CASE OF CAROTID-BASILAR ANASTOMOSIS
WITH MULTIPLE ASSOCIATED CEREBROVASCULAR ANOMALIES

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The first report of a case of carotid-basilar anastomosis, as far as the writer
knows, was by Quain\textsuperscript{10} in 1844. From then until 1950, 14 more cases observed at
autopsy were reported in the literature. The advent of angiography made it possible
to diagnose this condition during life, and this possibility was mentioned by Hasen-
jäger\textsuperscript{4} in 1937. However, not until 1950 was there a report of a case in which the
diagnosis was actually made by this method (Sutton\textsuperscript{19}). Another case is known to
have been demonstrated angiographically by Sugar\textsuperscript{11} (not published). Harrison and
Luttrell\textsuperscript{5} published 3 more angiographically demonstrated cases in 1938, in 1 of
which postmortem examination was also made.

In 4 of the 20 cases so far described in the literature, the diagnosis was made
during the patient's lifetime by means of angiography. One more case is known to
have been angiographically observed by Sugar. Postmortem examination was made
in 18 cases. Of the angiographically diagnosed cases, autopsy was performed in 2.

Sutton\textsuperscript{13} found his case among nearly 1000 angiograms. Harrison and Luttrell's\textsuperscript{2}
3 cases were encountered in a series of 582 cerebral angiograms. Lindgren\textsuperscript{6} found
none in 1526 cases. The case reported here was the only one in a series of nearly 600
angiograms.

CASE REPORT

E.B., a 40-year-old white male, was admitted to Syracuse Memorial Hospital with the
chief complaint of convulsions, headache and diplopia.

Until 2 days prior to admission, he had been in his usual state of good health when, at
3:00 a.m., he was awakened by a severe frontal headache. At 6:00 a.m. his wife noted he
was breathing heavily and foaming at the mouth, with eyes rolled upward. He had urinary
and fecal incontinence. When he regained consciousness, he felt weak, but carried out his
usual Sunday activities with severe distress. The headache became increasingly severe and
empirin gave no relief. The following day he noticed a sudden onset of diplopia in the late
afternoon. This was accompanied by an increase in the severity of the headache.

Examination. On admission the patient was alert, cooperative, and well-oriented. Except
for a 6th nerve paralysis on the left, the cranial nerves were normal. There was moderate
nuchal rigidity. Babinski's reflex was positive bilaterally.

Spinal tap yielded bloody spinal fluid (150000 RBC).

EEG revealed a moderate bilateral slight dysrhythmia with some localization toward the
right.

Angiography (Fig. 1) demonstrated a berry aneurysm originating from the left middle
cerebral artery about 2 cm. above the bifurcation of the internal carotid artery. In addition,
a persistent carotid-basilar anastomosis was clearly demonstrated and the posterior cerebral
and basilar arteries were visualized by carotid injection.

Course. On the following day, the patient became suddenly comatose; his respirations
deepened, and became irregular and stertorous. He expired within 30 minutes, at 2:30 a.m.
Autopsy was limited to the head. It disclosed the following cerebrovascular anomalies:

1. Persistent carotid-basilar anastomosis on the right, arising from the internal carotid artery in its intradural portion. It was seen to swing medial to the right posterior clinoid process, passing in the midline down to emerge in the midline from the dura mater covering the clivus, joining the basilar artery in its mid portion.

2. Both vertebral arteries as well as the basilar artery inferiorly to this junction were found to be very small, the left vertebral artery being even smaller than the right (Fig. 2).

3. Absent posterior communicating artery on the left; the right posterior communicating artery was rather small.

4. There were two anterior communicating arteries joined in the midline by an additional short branch, thus producing an "H"-shaped connection between the two anterior cerebral arteries.

5. Berry aneurysm, measuring 0.5 cm. in diameter, originating from the middle cerebral artery about 2 cm. above the internal carotid bifurcation.

There was a moderate amount of sub-