ANOMALOUS REDUPLICATION OF THE CIRCLE OF WILLIS

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Considerations concerning the embryologic development of the intracranial blood vessels frequently provide an explanation for vascular anomalies encountered in the brain during postnatal life. Recently we have observed an unusual example of the latter which may be characterized as a persistence of definite but otherwise transient vascular channels concerned with the formation of the circle of Willis. Academic as well as practical considerations merit this report.

Fig. 1. Photograph of angiogram which demonstrates anomalous circulation in the distribution of the posterior cerebral artery.

CASE REPORT

A 28-year-old right-handed white male of apparently normal mental development was admitted to the hospital because of confusion which appeared suddenly about 24 hours prior to admission. Past history revealed that he had experienced a transient episode of right hemi-

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331
paresis of 2 weeks' duration 2½ years previously. Examination revealed aphasia and mild hemiparesis of the right arm and leg. The remainder of the neurologic findings were considered normal.

Bilateral carotid angiograms revealed increased vascularity in the parasellar and parasagittal regions. Although the middle cerebral arteries could not be identified, a communication between the carotid and posterior cerebral arteries could be visualized (Fig. 1). A pneumoencephalogram revealed generalized ventricular dilatation and separation of the frontal horns suggestive of a space-occupying lesion in the region of the corpus callosum.

The patient became comatose and the hemiplegia increased in severity. A bifrontal-parietal craniotomy was performed. The arachnoid was thickened and the gyri of the frontal lobes were atrophic. No discrete mass could be discerned and rapid frozen sections of biopsies from the left frontal lobe revealed oligodendrogliosis which was confirmed by study of paraffin sections. The patient remained comatose and succumbed 1 month following operation.

Necropsy. Significant pathologic findings were limited to the brain, which weighed 1110 gm. A surgical defect was evident in the left frontal lobe. Softening of cerebral substance was appreciated in both frontoparietal areas. The sulci were pronounced and the gyri were narrow.

The usual pattern of the circle of Willis could be identified, although the right posterior communicating artery appeared larger than the left (Figs. 2 and 3). A portion of the left carotid artery had been torn during removal of the brain. In addition, numerous fine vessels

![Figure 2](image-url)