A Defect of the Anterior Part of the Corpus Callosum Simulating Tumour

F.P. Probst
Neuroradiological Section, Department of Diagnostic Radiology, University of Umeå, Umeå, Sweden

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Summary. Two cases with encephalographic appearances typical of anteriorly situated but angiographically avascular tumours of the corpus callosum are described. The first case was found, however, to be due to a partial anterior callosal defect. The essential difference between the two cases was the presence of an arterial vascular dysplasia in the case with the callosal defect.


Anterior and intermediate defects of the corpus callosum are very rare. Apart from a few cases mentioned in the early anatomical literature [2] only two other cases seem to have been published [1, 6]. Case 1 in the present paper is thus the third to be reported in modern times and the second in which a tumour was closely imitated, in some respects being similar to the case mentioned in [1]. Two aspects, those of diagnosis and of the mechanism of development, are of particular interest. A case with a malignant tumour, in which there were similar neuroradiological features (Case 2), illustrates the difficulties encountered in the differential diagnosis.

Case Reports

Case 1. A man, aged 62, was found in a mentally confused state considered to be due to an organic cerebral lesion. An EEG was abnormal in the posterior frontal and anterior parietal regions on the right side. Encephalography (Fig. 1) indicated that the anterior horns, together

Fig. 1. Case 1. Anterior callosal defect associated with vascular dysplasia. Encephalography. Anterior parts of lateral ventricles are separated by a mass which seems to bulge from above (→). Open circle indicates posterior border of foramen of Monro
with the adjoining parts of the lateral ventricles, had been pushed apart and deformed by a soft tissue mass that was bulging downwards from above. The posterior portions of the lateral ventricles were normal in shape and position, and the posterior half of the corpus callosum was outlined in the ordinary way by the gas in its cistern. The third ventricle was not enlarged. Bilateral carotid angiography (Figs. 2, 3) revealed that the left anterior cerebral artery ran in a forward direction along the bottom of the anterior cranial fossa. It then turned backwards, at an angle of 180 degrees, to form a very marked curve, with frontal concavity, in the part rising towards the region of the genu, called here the 'pericallosal artery' (double-crossed arrows). The right anterior cerebral and pericallosal arteries were normal, and the upper parts of both pericallosal arteries ran parallel, as if they were following a corpus callosum. The artery, marked with a crossed arrow in Fig. 2 and shown in black in Fig. 3, connected the origins of the two pericallosal arteries and closed the circle of Willis in front. It thus corresponded, in function, to the anterior communicating artery. Both internal cerebral veins were compressed from the front, in a backward direction, with the venous angles lying in a more postero-basal position than normally. Their anterior tributaries splayed out fan-wise, especially on the left side, and the septal veins were elongated, depressed, and showed a concave deformity superiorly.

In spite of the vascular anomaly which was obviously due to a developmental disturbance, and although no signs of pathological vascularization were to be seen, it was considered that a tumour was the most likely diagnosis. At operation the frontal gyri on the convexity were found to be somewhat atrophic, but there were no other visible or palpable changes in or around the frontal lobes. The pericallosal arteries were identified on exploration of the interhemispheric fissure. No corpus callosum was present in this region; neither was there any tumour. The roof of the third ventricle was very thin and the mediobasal parts of the frontal lobes seemed normal.

Case 2. A man, aged 64, with grand mal, disorientation, headache, attacks of vomiting, and urinary incontinence. Bilateral carotid angiography revealed the changes de-

Fig. 2. Case 1. Arterial phases of left and right (b) carotid angiography and late venous phase (c). The anomalous mediobasal forward continuation of the left anterior cerebral artery (crossed arrow in a; hatched in Fig. 3) might be a persisting primitive olfactory artery. It is connected with the origin of the right pericallosal artery by a communicating artery (crossed arrow in b; black in Fig. 3). The internal cerebral vein (e) appears to be compressed posteriorly and the septal vein (ring arrow) stretched and concavely deformed. An anterior horn vein is also arched as if it surrounded a mass bulging into the ventricular cavity (upper ball arrow). The ‘mass’ is an ‘inrolled’ part of the marginal convolution, since a tumour was excluded at operation.