Detection of Porencephaly by Cerebral Dynamic Scanning

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Abstract. Routine cerebral dynamic scanning in two patients revealed unilateral focal areas of decreased radionuclide activity between the anterior and middle cerebral arteries; the subsequent brain scans were normal. Both patients were shown to have porencephaly by isotope cisternography and computed tomography (CT) scans. When a focal avascular area is noted on cerebral dynamic scanning in the presence of normal static images, the possibility of a porencephalic cyst should be considered.

Introduction

This report describes two patients in whom a persistent focal region of decreased radionuclide activity was noted between normal middle and anterior cerebral artery activity. This finding suggested the possibility of porencephaly and that diagnosis was confirmed by radioisotope cisternography and computed tomography.

Case 1

A 54-year-old woman was hospitalized with a two month history of dementia and gait ataxia. Her past medical history included the surgical clipping of a right anterior communicating artery aneurysm five years previously. As part of the initial evaluation, the patient's physician requested a brain scan. Following the intravenous injection of 15 mCi of technetium-99m pertechnetate, cerebral dynamic images were obtained in the anterior projection at 2 s intervals using a scintillation camera. Static brain images of 400,000 counts were obtained in 5 views 2 h after radionuclide injection. The radionuclide angiogram revealed a focal region of diminished activity between the right anterior and middle cerebral artery which was present during the early arterial phase and persisted throughout the venous phase (Fig. 1). The static images were normal. Using the method of Alazraki, and co-workers, a cisternogram was performed eight days later with 0.5 mCi of Indium-111-DTPA in 10% dextrose (Alazraki et al., 1973). The cisternogram showed ventricular penetration and persistence at 24 and 48 h as well as accumulation of radiopharmaceutical in the anterior portion of the right cerebral hemisphere (Fig. 2b) corresponding to the location of decreased counts seen on the dynamic brain images (Fig. 2a). A cerebral CT scan revealed a cystic region in the right cerebral hemisphere which appeared to communicate with the right lateral ventricle (Fig. 3a) and corresponded in location to the abnormal radionuclide activity seen on the cisternogram (Fig. 3b). The patient's symptoms gradually improved and she was discharged without surgical treatment.

Case 2

A 43-year-old man, one year status post resection of a pituitary chromophobe adenoma, presented with a memory deficit and gait disturbance of five months' duration. An anterior cerebral radionuclide angiogram and 2 h delayed static brain images were obtained. The dynamic study revealed a focal region of decreased radionuclide activity in the left hemisphere (Fig. 4) present during arterial, venous, and delayed images.

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capillary, and venous phases of the study, similar to the abnormality described in Case 1. The static images were normal. Seven weeks later, a cerebral CT scan demonstrated a left frontal porencephalic cyst (Fig. 5a) clearly communicating with the left lateral ventricle. A subsequent radionuclide cisternogram performed with 0.5 mCi Indium-111-DTPA in 10% dextrose revealed ventricular penetration and an abnormal accumulation of the radiopharmaceutical in the left frontal porencephalic cyst (Fig. 5b). The cisternogram also demonstrated delayed ascent of the radionuclide over the cerebral convexities at 72 h. Following a ventriculostriatal shunt, the patient has noted improvement in his ataxia.