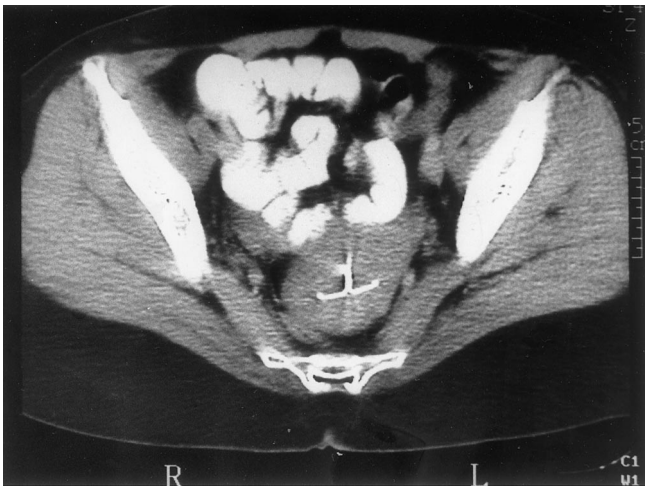

Fig. 2. A CT did not show any metastatic disease but did reveal an IUD in the uterine cavity causing metallic artifacts because of its copper content. No myomata or intraluminal uterine fluid were noted. Clinical gynecologic examination and follow-up at 12 months revealed no abnormality.

Increased FDG uptake in the uterus has been noted in cases of hematocolpos and myomas of the uterus (1,2). In our patient, both conditions were excluded by CT. The exact mechanism of action of the IUD is unclear. It has been thought to affect the sperm, to prevent fertilization, and to destroy fertilized ova as a result of a sterile foreign-body reaction, inflammatory in nature (3–5). The mildly increased uptake probably represented the inflammatory reaction caused by the IUD. This false-positive finding on the FDG-PET study is thus in vivo evidence of the mechanism of action of this contraceptive device.

Postinfectious Encephalitis

A Coregistered SPECT and Magnetic Resonance Imaging Study

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An 11-year-old boy was hospitalized for acute headaches, lethargy, and left hemiparesis. A lumbar puncture showed polymorphonuclear leukocytes, but cultures remained negative. Flow-attenuated inversion recovery magnetic resonance imaging (MRI) was performed, as was brain SPECT using Tc-99m hexamethylpropylene amineoxime (HMPAO). Anatomic and functional images were coregistered using a unique surface-matching technique. Subsequently, biopsy of a large right frontal lobe lesion was performed. Pathologic examination and electron microscopy showed degeneration of cortical neurons and associated arenavirus-like particles. Whether this caused the disease or represented release by dying neurons of previously present particles remains uncertain.

Key Words: Arenavirus, Brain SPECT, Coregistration, Encephalitis.

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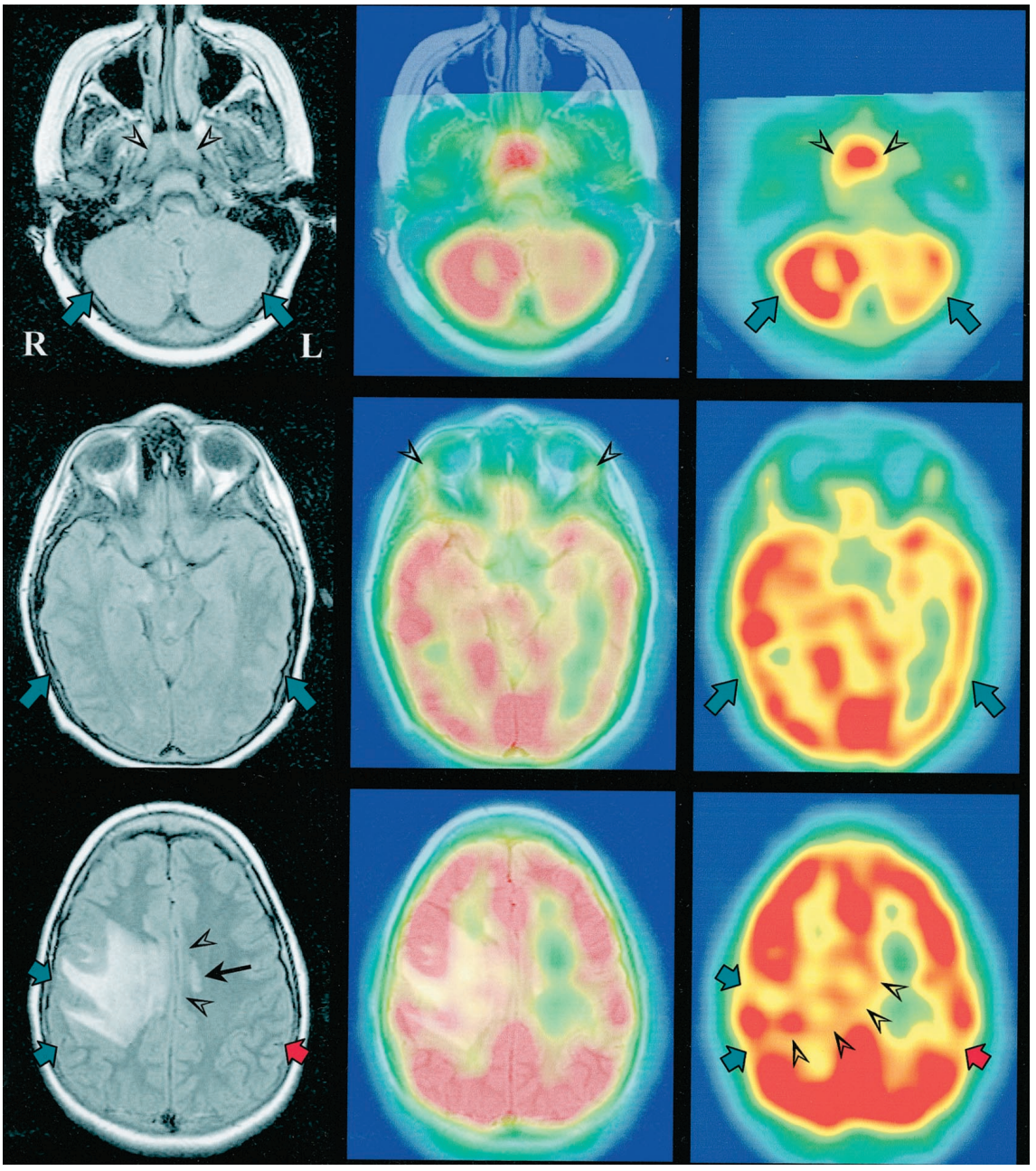

Fig. 1. The left column shows the brain MRI at three levels; the right column shows the reoriented SPECT images at those same levels; and the middle column shows the superimposition of both methods. Reorientation, coregistration, and reslicing of the SPECT to the MRI geometry were performed using custom software based on Powell surface matching and affine deformation with 12 degrees of freedom (1).

The upper row images are located 5 cm below the anterior commissure–posterior commissure (AC–PC) plane. They show decreased perfusion of the left cerebellar hemisphere (green arrows), with no anatomic changes on the MRI, supporting the findings of crossed cerebellar diaschisis. Black arrowheads indicate the incidental finding of adenoidal hyperemia on the SPECT study, associated with thickening of this lymphoid tissue on the MRI.

The middle row images are located 1 cm below the AC–PC plane. They show asymmetry of temporal lobe perfusion (green arrows), which was interpreted as a decrease on the left. No structural changes appear on the MRI. Note the accuracy of the matching algorithm on the middle image, as confirmed by visualization of the lachrymal glands outside the eyes (black arrowheads).

The lower row images are located 3 cm above the AC–PC plane. The MRI shows a large edematous focus in the right frontal lobe causing a substantial mass effect on the medial structures (black arrowheads), with extension through the corpus callosum to the left hemisphere (black arrow). The process infiltrates and compresses the right frontoparietal cortex (green arrows). On the corresponding SPECT image, the periphery of the process shows increased perfusion (black arrowheads), whereas cortical infiltration is associated with areas of decreased perfusion (green arrows), including a focus in the contralateral parietal region (red arrow). The association of adenoiditis, an edematous mass with increased perfusion and cortical ischemia with crossed cerebellar diaschisis, strongly suggests a postinhalation infectious process, which was later supported by the biopsy results (2).