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BRAIN SCAN ABNORMALITIES PRODUCED BY ELECTROENCEPHALOGRAPHIC PROCEDURES

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Brain scintiphotographic abnormalities may be produced by minor scalp manipulation. The interpreter must be aware that even trivial trauma may cause error in interpretation.

Recently, we have seen areas of increased superficial radionuclide concentration in brain scintiphotographs of patients who have undergone this examination and electroencephalograms during the same time period.

METHODS

Patients were routinely prepared with 500 mg of potassium perchlorate, received a bolus injection of 20 mCi of ^{99m}Tc-pertechnetate, and underwent static scintiphotography 1–2 hr later.

CASE REPORTS

A 20-year-old woman was receiving an outpatient workup for a seizure disorder. Technetium-99m-pertechnetate was administered and she underwent electroencephalography. The static scintiphotographs were obtained after the electroencephalography and an obvious superficial lesion in the high right parietal area was identified (Fig. 1, Left). Forty-eight hours later, the brain scintiphotographic procedure was repeated. The right lateral scintiphotograph is shown in Fig. 1 (Right).

A 52-year-old man was receiving a workup for a possible intracerebral space-occupying lesion. Brain scintiphotography was performed in the routine manner; however, unknown to the interpreting physician, immediately before the scan procedure an electroencephalogram was performed. Figure 2 is the left lateral and vertex view obtained on this examination. Because of the identification of the increased area of radionuclide concentration, extensive workup was undertaken and was found to be negative.

A repeat brain scintiphotographic examination was performed 2 weeks after the first examination and at this time no abnormalities were identified (Fig. 3).

DISCUSSION

Oldendorf (*1*) has demonstrated that the halo of activity around the cranial activity is because of

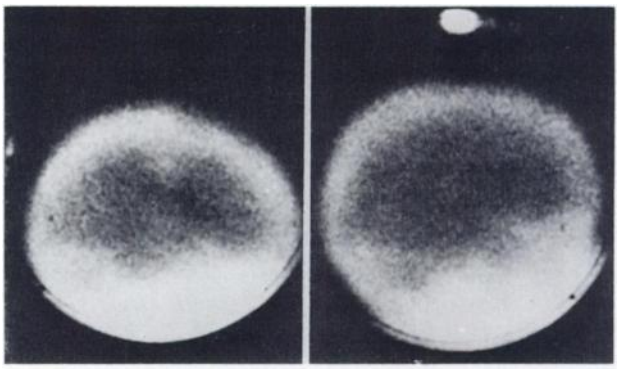

FIG. 1. (Left) Initial scintiphotograph obtained when patient had EEG procedure. (Right) Repeat study 48 hr later.

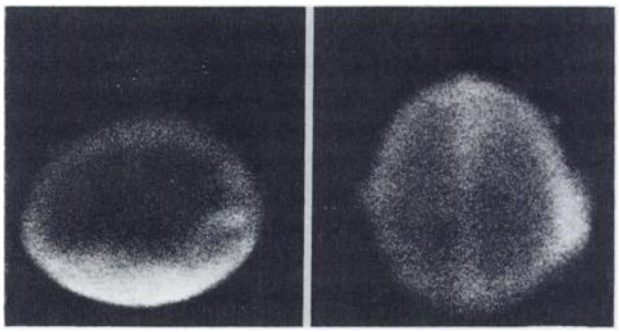

FIG. 2. Left lateral and vertex view in patient who had EEG procedure just before scintiphotography.

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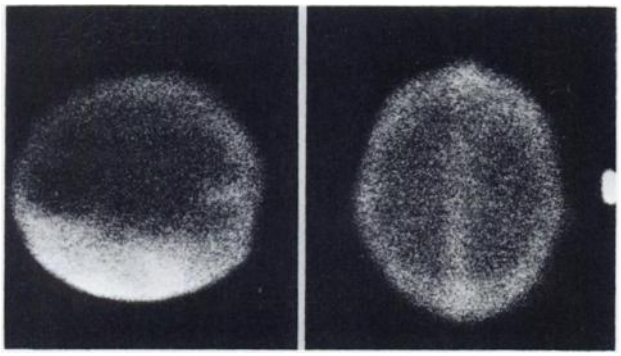

FIG. 3. Same views on repeat examination of same patient 2 weeks later.

the radionuclides accumulating in the extracellular fluid in the scalp and skull.

Electroencephalographic electrodes are attached to the scalp at this hospital by means of electrode glue, local mild abrasion, and air drying. When an electrode slips or shows poor contact, the technician will reapply the electrode in the same area using additional abrasion and glue. This suggests that the local increase in activity seen in the initial scintiphotographs and not in the second examination were secondary to local trauma and increased extracellular fluid concentration in the areas of electrode placement.

Although expedient, it appears that one should avoid performing brain scintiphotography when even minor manipulation of the scalp has recently been done or will be done between the time of injection and the scanning procedure. If the study is immediately necessary, then the examiner must be aware that superficial abnormalities may be produced by electroencephalographic procedures and modify his interpretation of the examination accordingly.

REFERENCE

1. OLDENDORF WH: Distribution of various classes of radiolabeled tracers in plasma, scalp, and brain. *J Nucl Med* 13: 681–685, 1972