

Fortuitous scan documentation of the development of an intracerebral hematoma

Case report

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THE presence of an intracerebral hematoma can be correctly and reliably demonstrated in a majority of cases by scintillation scanning of the brain.²⁻⁵ The radiotracer and instrumentation appear to be less important than the timing of the scan.^{1,5} Optimal delineation of the lesion occurs in the 2nd and 3rd weeks following the insult. Operative data indicate that the concentration of isotope occurs not in the hematoma itself but in the adjacent compressed and damaged brain tissue.³ This damage and peripheral reaction require time to develop, explaining the high positivity of scans 1 to 2 weeks after the event.

We witnessed the development of an intracerebral hemorrhage in our laboratory during the actual process of brain scanning. An initial brain scan was negative. A second brain scan initiated within 15 minutes of completion of the first, and following a grand mal seizure by the patient, revealed a densely radioactive intracerebral mass. Following surgical exploration and evacuation of a hematoma, the scan returned virtually to normal.

Case Report

A 59-year-old woman was admitted to the hospital following a 24-hour history of dysarthria, somnolence, and right-sided weak-

ness. There was no fever, headache, or neck stiffness. The patient had a 4-year history of hypertension and was being followed regularly in the hypertensive clinic, and being treated with chlorthiazide, reserpine, and phenobarbital.

Examination. The patient was oriented, slightly lethargic, and dysarthritic. Her blood pressure was 240/130, pulse 73, respiration 18, and temperature 98.6. Positive physical findings were limited to the neurological examination. There was moderate muscle weakness on the right side, and slightly diminished sensitivity to fine touch and pinprick on the right side of the body below the neck. The deep tendon responses and cranial nerve function were normal. The admission diagnosis was infarct of the left internal capsule infarct with hypertension.

Approximately 24 hours after admission, a brain scan was performed. The scan consisted of the four conventional projections performed on a Nuclear Chicago Pho/Dot, Model 1735, with a 3-inch crystal, using a 19-hole focusing collimator. Scanning was begun 1 hour after the injection of 10 mCi of Technetium-99m pertechnetate, and was completed at 2 p.m. Figure 1 shows the anterior and right lateral projections on this scan, which were felt to be essentially normal. Immediately after the study was com-

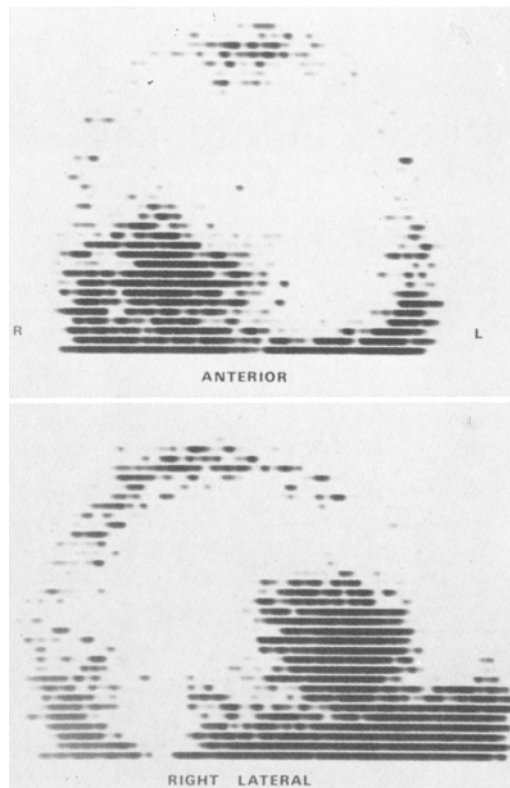
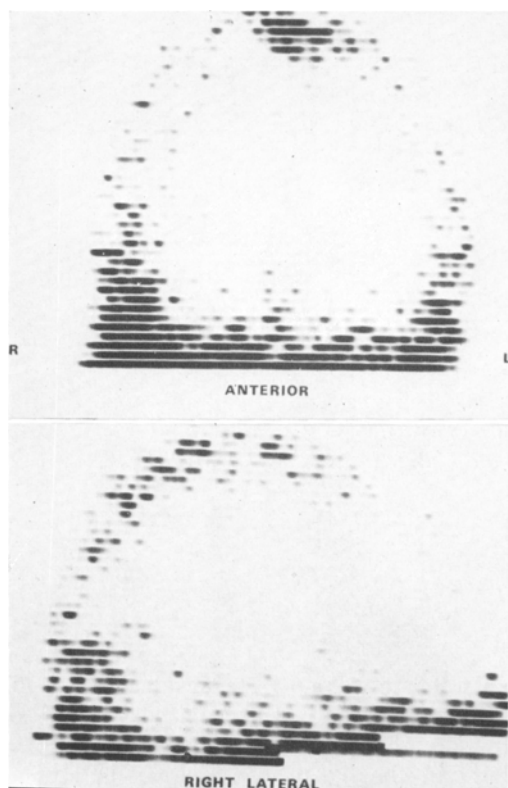


FIG. 1. Initial scan done 24 hours after admission, interpreted as essentially negative.

FIG. 2. Second scan started 15 minutes after completion of the first scan. The patient's convulsion occurred between the first and second scans. There is now a 7-cm spherical concentration of radioactivity in the right frontal lobe.

pleted, the patient suffered a grand mal convulsion which lasted about 1 minute. Following the convulsion the patient remained dull, with a fixed and dilated right pupil and a constricted left pupil. At 2:15 p.m. another brain scan was begun (Fig. 2) which demonstrated a 7-cm spherical lesion of maximal radioactivity in the right frontal lobe. The scan was interpreted as an acute intracerebral hemorrhage. Subsequently, a right retrograde brachial angiogram was performed which demonstrated an avascular mass in the right fronto-parieto-temporal area, which was felt to represent an intracerebral hematoma.

Operation. The patient underwent a right craniotomy 12 hours later, and a large intracerebral hematoma was found in the right frontotemporal area. Approximately 150 cc of blood were evacuated. A repeat brain scan (Fig. 3) performed on the 7th postop-

erative day demonstrated only scant radioactivity at the site of the lesion. The patient has remained comatose since surgery.

Discussion

There is little question that the hemorrhage indeed occurred in the interval between the two scans. Occasionally, lesions accrete radionuclides at a slow rate; however, in this case the first scan (Fig. 1) was clearly negative and the second strikingly positive. The radiodensity of the lesion was maximal in relation to the anatomical vascular structures in the second scan (Fig. 2). Only 15 minutes elapsed between the end of the first scan and the beginning of the second.

Brain lesions that accrete radioactivity do so slowly, in a gradual rather than precipitous manner, and rarely achieve maximal radiodensity. Also, the clinical events coincide

Intracerebral hematoma

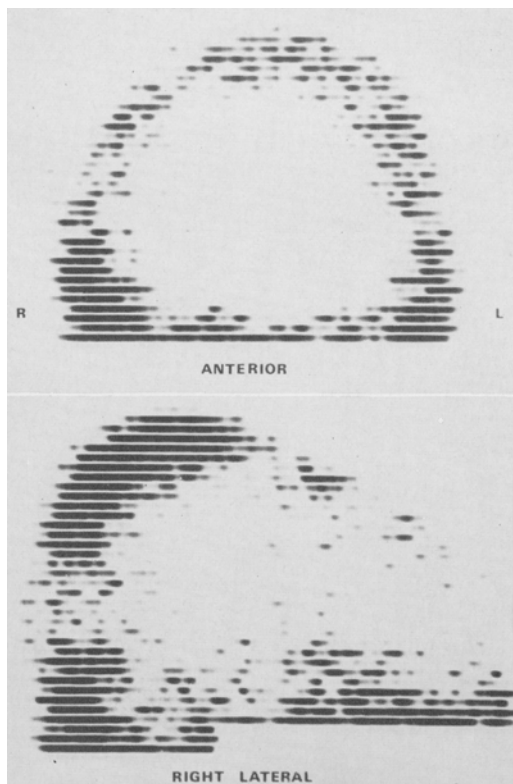


FIG. 3. Third scan performed on the 7th post-operative day following evacuation of an intracerebral hematoma. The increased concentration of isotope in the parietal convexity is related to the surgical procedure.

with the scan findings.

In this case, the radioactivity was apparently within the hematoma itself, its activity being comparable to that of the surrounding

vascular structures. This is unlike the usual demonstration of intracerebral hematoma where radionuclide accretion occurs in the adjacent compressed brain tissue and only after an interval of 3 to 14 days.^{1,5}

Summary

The development of an intracerebral hemorrhage during a brain scanning procedure has been reported and discussed.

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