Brain Tumor Uptake of Iodo-Alpha-Methyl-Tyrosine

TO THE EDITOR: I have read with great interest the article by Langen et al. on brain and brain tumor uptake of ^{123}I-labeled iodo-alpha-methyl-tyrosine published in the *Journal* (*J Nucl Med* 1991;32:1225–1229). The accompanying editorial by William Oldendorf in the same issue (pages 1229–1230) is also most interesting and does make the point that once again the possible potential for SPECT work in clinical medicine is further extended.

For the record and as a matter of interest, I would like to demonstrate a case study that we published in 1982 on a 67-yr-old female admitted with a recent history of a swelling in the front of her left ear which was thought to be due to tumor in the parotid gland (*1*). A biopsy specimen revealed an amelanotic melanoma with anaplastic features. We were able to scan this patient with ^{99m}Tc-glucoheptonate and ^{123}I-alpha methyl tyrosine and carry out tomographic studies with both tracers. The 1982 study (Fig. 1) demonstrate the presence of multiple cerebral secondaries which were best demonstrated with the labelled glucoheptonate tracer, but were also shown by the alpha methyl-tyrosine radiopharmaceutical. Interestingly, while three deposits were demonstrated in the ^{123}I-alpha methyl-tyrosine SPECT scan, a large more centrally located lesion demonstrated on the glucoheptonate study was missed.

Multiple tracer studies will add to the interest of SPECT as a tool for the investigation of primary and secondary deposits in the brain. It is important, however, to note that metastasis from a primary tumor even within the same organ may exhibit rather different metabolic properties. This is well known to oncologists with a keen interest in radioimmunoscintigraphy, i.e. the varying differentiation of metastasis arising from a common primary in the same individual at any particular stage of the disease process.

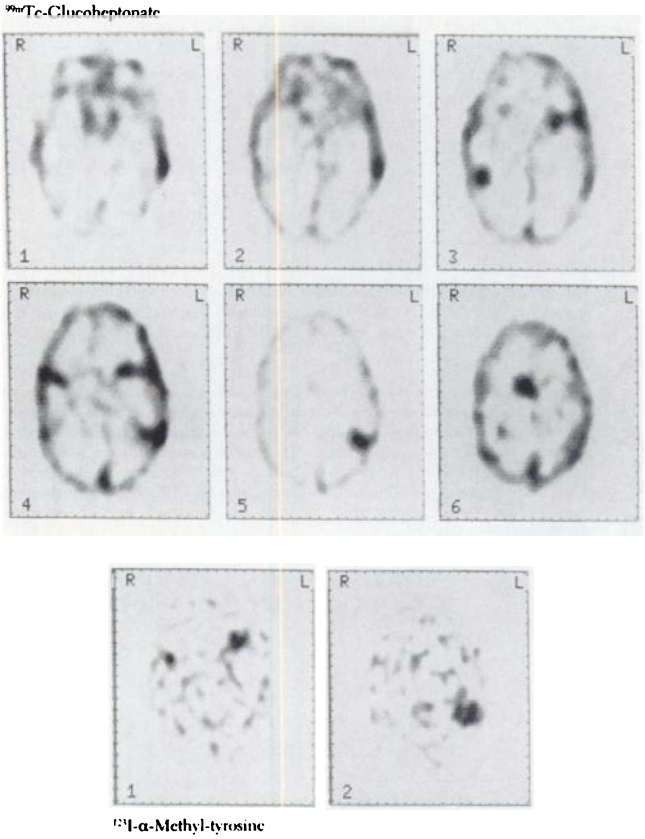

FIGURE 1. Planar gamma camera views are shown in anterior and right lateral projections. Multiple areas of abnormal and focal increased uptake are demonstrated compatible with deposits. This study clearly shows the extent of the multiple intracerebral deposits and provides a dramatic representation of the widespread nature of the disease. Two comparative studies were performed: ^{99m}Tc-glucoheptonate (top) and [^{99m}Tc]pertechnetate (bottom). Note the improved signal-to-noise ratio obtained with ^{99m}Tc-glucoheptonate. (Figure reprinted with permission from reference 1).

REFERENCE

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REPLY: We thank Professor P. J. Ell for bringing this interesting case report, which is not in the open literature, to our attention. To the best of our knowledge, his case report represents the first SPECT brain study with ^{123}I-α-methyl tyrosine. The first in vivo studies with this labeled tyrosine derivative, however, were performed by the Jülich group (*1–3*), also in oncology (*2,4*).

It was interesting to note that one of the lesions revealed by ^{99m}Tc-glucoheptonate did not accumulate ^{123}I-α-methyl tyrosine. This observation supports the finding that the accumulation of ^{123}I-α-methyl tyrosine in brain tumors is not due to a disruption of the blood-brain barrier, but rather a consequence of an increased amino acid transport (*5–7*). In the era of computerized tomography and nuclear magnetic resonance it is not the aim of SPECT studies with ^{123}I-α-methyl tyrosine to detect space-occupying lesions, but, instead, to achieve an in vivo characterization of tumor biochemistry. The potential of such investigations, e.g., in determining the grade of malignancy or in measuring therapeutic effects, has clearly been demonstrated by PET studies during the last ten years and may become a routine procedure in clinical practice when tracers like ^{123}I-α-methyl tyrosine are generally available for SPECT studies.

REFERENCES

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