



FIG. 3. Top: Emission tomograms of skull prove lesion to be within soft tissue. Bottom: Conventional gamma camera scans of skull.

the knee joint. She made a satisfactory postoperative recovery and was discharged 3 wk later, walking satisfactorily and attending the Physiotherapy Department for knee mobilization.

The original biopsy was reported as showing features of osteosarcoma. This diagnosis was reviewed in the light of the radiological and operative findings, and in the review report it was suggested that the neoplasm could be regarded as falling within the spectrum of juxtacortical osteosarcoma but that recurrence



FIG. 4. Soft-tissue lung deposits demonstrated on whole-body bone scan at a time when chest radiograph was negative.

might occur. The scalp nodule was reported as showing regular bone and osteoblasts similar to that in the previous biopsy in the more differentiated areas. Study of the surgical femur specimen showed the features of the tumor to be essentially similar to those reported before. However, there were frankly sarcomatous elements seen at the base of the biopsy and there was evidence of extension, both into the medullary cavity and into the surrounding soft tissue. The impression was that the behavior of this lesion is likely to be worse than that of a typical paraosteal osteosarcoma.

She was seen again in the combined bone-tumor clinic 3 wk later, walking well. A chest radiograph performed at this time showed no abnormality, but a bone scan (Fig. 4) was positive. She was readmitted 2 wk later and tomograms of the lung fields showed metastases in both mid zones. On this occasion, a repeat whole-body scan showed rapid progression in several lung deposits previously detected.

Juxtacortical "paraosteal" sarcomas are rare, constituting less than 5% of all osteosarcomas. These tumors arise from periosteum and tend to grow slowly. The malignancy is usually of low grade—a cure and a survival of up to 9 yr have been reported (1). Eventually, however, soft-tissue lung deposits tend to occur.

Usually these tumors occur between the ages of 20 and 40 yrs, but in this particular case, it was diagnosed at age 51. At the time of presentation, the whole-body bone scan revealed metastatic spread to the "skull" and it was the emission tomogram that revealed the deposit to be within soft tissue of the left temple and not in bone. The follow-up whole-body bone scan was again the first investigation to demonstrate soft-tissue lung secondaries, later confirmed by chest radiograph and tomography. The particularly rapid spread of this tumor was proved again on the repeat whole-body bone scan.

The dramatic appearance of a 2.3-mm lesion in the emission tomogram points once again to the importance of the signal-to-noise ratio and contrast resolution, rather than spatial resolution—in this case FWHM-9 mm (2)—within nuclear medicine imaging techniques. The improvement in lesion demonstration in depth with an emission tomographic scanner is once again documented.

A rare case of a paraosteal sarcoma is presented. The unusual pattern of spread was diagnosed first by means of whole-body bone and emission tomography techniques.

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[⁷⁵Se]Selenomethionine Uptake by the Pancreas

The interesting paper by Atkins and Som (1) on the effects of growth hormone and somatostatin on the uptake of [⁷⁵Se]selenomethionine by the pancreas raises the broader issue of the factors that influence the uptake of radiopharmaceuticals by the pancreas. Several years ago we made a study of the influence of pretreatment with a variety of agents on the uptake of selenomethionine by the rat pancreas. The substances selected were those

whose effects might be expected to have a direct or indirect effect on pancreatic function, and the aims of the study were to identify agents that might be exploited clinically to improve pancreatic imaging, and to identify conditions that might give rise to problems in the clinical use of [⁷⁵Se]selenomethionine.

Out of 16 different agents examined, ranging from thyroid hormones to protein synthesis inhibitors, only one, propylthiouracil (50 mg/kg i.p. for 3 days before selenomethionine injection) resulted in a significant increase in the pancreatic uptake and in the pancreas-to-liver concentration ratio. The tests were run in male August rats at 60 min after tracer injection. In the propylthiouracil-treated animals the pancreas-to-liver ratio was 5.00 ± 0.10 (s.e.m.) compared with 4.00 ± 0.04 (s.e.m.) in control animals. Thyroxine, triiodothyronine, and the thyroid-suppressant drugs potassium perchlorate and carbimazole produced no significant effect on pancreatic uptake of [⁷⁵Se]selenomethionine when the agents were administered for 3 or 4 days before the radiopharmaceutical. Stilbestrol, hydrocortisone, insulin, the diabetogenic agent alloxan, and carbachol (the parasympathomimetic agent that stimulates pancreatic secretion) all significantly reduced the pancreas-to-liver concentration ratio to values ranging from 2.32 to 3.05 at 60 min after i.v. injection of [⁷⁵Se]selenomethionine. Theophylline and cycloheximide also significantly reduced the pancreas-to-liver ratio.

The reasons for the small stimulatory effect of propylthiouracil are not clear; it exerts a number of effects on the thyroid gland, and at the dose levels used promotes thyroid hyperplasia as a result of thyrotropin release from the anterior pituitary. We note that propylthiouracil was observed previously to reduce the pancreas-to-liver ratio following injection of ⁶²ZnCl₂ to rats of the same strain (2). Thus, whereas Atkins and Som found that growth

hormone depressed [⁷⁵Se]selenomethionine uptake but increased that of Zn-65 thioglucose, propylthiouracil (perhaps also acting through a pituitary pathway) depressed ⁶²ZnCl₂ uptake but increased the pancreatic uptake of selenomethionine. In view of the continued widespread use of [⁷⁵Se]selenomethionine and the increasing interest in the possible use of carbon-11-labeled amino acids (3), more detailed investigations of the endocrine and other factors influencing the uptake of radiopharmaceuticals by the pancreas appears to be well merited.

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SNM PRAIRIE PROVINCES CHAPTER 12th ANNUAL MEETING

April 10-12, 1980

Chateau Airport

Calgary, Alberta, Canada

The 12th Annual Meeting of the Prairie Provinces Chapter of the Society of Nuclear Medicine will be held April 10-12, 1980 at the Chateau Airport in Calgary, Alberta.

The Joint Scientific and Technical program features two Keynote Lectures by Dr. Kuhl and contributed papers on In vitro and In vivo Nuclear Medicine as well as Radiochemistry. The Annual Business Meeting of the Chapter will follow on the twelfth.

Additional features will be a banquet and dance as well as commercial and technical exhibits.

Abstracts are invited from members and interested nonmembers with a deadline for receipt being March 15, 1980.

Direct abstracts and inquiries to:

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