# LETTERS TO THE EDITOR

## Symmetrical Hypofunctioning Thyroid Nodules and Medullary Thyroid Carcinoma

Hypofunctioning nodules smaller than 10 mm generally cannot be detected with accuracy by rectilinear scanning equipment, although nodules 6 mm in diameter can be obtained by gamma camera images. Once a hypofunctioning nodule has been detected, the degree of suspicion that it may be cancer is based on other information such as clinical examination, history, age, sex, and incidence of nodular goiter in the population. It is usually recognized, however, that the presence of a single hypofunctioning nodule in an otherwise normal-appearing thyroid gland has the highest probability of being thyroid cancer. We have observed the occurrence of symmetrical hypofunctioning nodules located at the middle third of the thyroid lobes in five of eight (62%) patients with palpable thyroid nodules from medullary thyroid cancer (MTC) (Fig. 1).

In 35 patients with familial MTC (patients with high basal or stimulated immunoreactive plasma calcitonin levels and immediate family members with MTC), we have observed unique radionuclide images. Five of the 35 thyroid images (14%) showed bilateral symmetrical hypofunctioning nodules that coincided with histologically proved MTC (Fig. 1). Eight of the 35 patients had nodules more than 10 mm in diameter and in five of these eight patients, the images demonstrated a symmetrical pattern.

Nodules in these 35 patients ranged from 5 to 38 mm (mean, 21.4 mm) at the largest diameter. All were characteristically located at the lateral portion of the upper and middle thirds of the thyroid lobes (*1*), and with one exception, the nodules were symmetrical. In this midregion of the lobe most of the C-cells are located in the normal human thyroid gland. All thyroid images were obtained with a rectilinear scanner or a gamma camera with pinhole collimator within 30 min after an oral dose (2–5 mCi) of [$^{99m}$Tc] sodium pertechnetate.

Although we do not consider the thyroid imaging studies sufficiently sensitive as a screening procedure for patients suspected of having MTC, we do believe that the demonstration of bilateral symmetrical cold nodules on a thyroid scan should alert the physician to the possibility of familial medullary thyroid carcinoma.

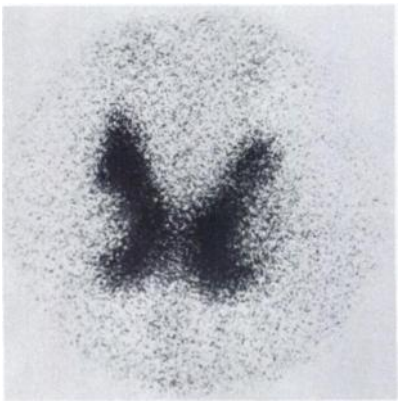

**FIG. 1.** Gamma camera thyroid scan with pinhole collimator demonstrating bilateral symmetrical cold nodules.

ROBERT J. ANDERSON
HEINZ W. WAHNER
Mayo Clinic and Mayo Foundation
Rochester, Minnesota

REFERENCE

*1.* WOLFE HJ, MELVIN KEW, CERVI-SKINNER SJ, et al: C-cell hyperplasia preceding medullary thyroid carcinoma. *N Engl J Med* 289: 437–441, 1973

## Ga-67 Citrate in Gynecomastia

In view of recent articles discussing possible mechanisms of gallium-67 citrate (Ga-67) uptake in female breasts (*1,2*), it seemed worthwhile to report a case of Ga-67 retention in the breasts of a man 4 yr after prostatectomy for carcinoma, and on a daily dose of 3.0 mg diethylstilbestrol. The course of his illness was complicated by bone metastases resulting in a lower thoracic compression paraparesis and by many episodes of recurrent urinary-tract infections. At the time of the present admission he had a fever of 102°F., suprapubic and costovertebral tenderness, and bilateral gynecomastia. When his fever failed to respond to antibiotics he had a Ga-67 scan in search of a possible occult, septic focus.

The Ga-67 scan (Fig. 1) showed abnormal uptake in the manubrium and in the sternoclavicular junctions, pelvis, and spine, all these being locations of known metastatic involvement. In addition, uptake was noted bilaterally in the lower anterior chest that extended beyond the lateral body contours and corresponded to the patient's pendulous breasts.

Increased uptake of Ga-67 in breast tissue due to causes other than neoplasm or inflammation has been reported in nine cases, eight of them female, six of them related to pregnancy, one with galactorrhea induced by phenothiazine derivatives, and one with idopathic galactorrhea. The ninth patient, a male with gynecomastia, had undergone orchiectomy for seminoma. The possible common denominator among them, and in the case presented here, is altered hormonal status leading to the situation described by Karsner (*3*) as "proliferation of connective tissue, together with variable degree of multiplication, elongation or branching of the ducts, without formation of true acini, accompanied by periductal or more widespread infiltration of lymphocytes, plasma cells, large mononuclear cells, and occasionally eosinophils, or neutrophilic polymorphonuclear cells or both; secretion is frequently present in ducts, which may be discharged spontaneously or can be manually expressed, but rarely, if ever, is it true colostrum or milk." Hoffer (*1*) attributes the uptake of Ga-67 in the breast to high concentrations of lactoferrin found in the human colostrum and milk, whereas Hayes (*2*) attributes it to an increase in lysosomal enzymes, which occurs in the mammary glands during gestation, lactation, and involution. In this connection, however, we note the reports describing uptake of technetium-99m pyrophosphate in female and gynecomastic breasts (*4,5*). This has been attributed to increased enzyme activity,