# FUNCTIONING METASTASES IN LIVER FROM THYROID CARCINOMA: CASE REPORT

S. H. Atmaram, R. D. Ganatra, S. M. Sharma, and L. Ramanna

*Bhabha Atomic Research Centre, Tata Memorial Hospital, Parel, Bombay, India*

***Radioiodine uptake in liver metastases was observed in two patients with follicular carcinoma of the thyroid.***

There are few reports in the literature of functioning metastases in the liver from differentiated thyroid carcinoma detected by scintigraphy, although in postmortem examination involvement of the liver is reported to be approximately 25% (*1–3*). It has been suggested that metastatic invasion of the liver is usually terminal (*4*). In a series of 349 patients with thyroid carcinoma seen in the last 10 years, we found two patients with definite metastases in the liver demonstrable as focal areas of positive concentration in the liver scan after administration of radioiodine.

## CASE REPORTS

**Case 1.** A 62-year-old woman was referred on July 10, 1967 for radioiodine ablation after total thyroidectomy. The thyroid histology was follicular carcinoma.

The clinical examination revealed a tender bony swelling 7 × 4 cm over the right mandible and a hard nodular liver that extended 5 cm below the costal margin.

An x-ray skeletal survey did not suggest any other bony involvement except for the mandibular erosion with pathologic fracture. Liver function tests were normal. Whole-body scan after a large tracer dose of 1.1 mCi of $^{131}$I showed two areas of abnormal radioiodine accumulation: one corresponding to the mandibular metastasis and the other in the epigastric region to the right of midline (Fig. 1). The radioiodine concentration in the liver could not be discharged with potassium perchlorate. Liver scan done with $^{131}$I-rose bengal demonstrated the same area to be "cold" (Fig. 2).

The patient received 945 mCi of $^{131}$I in divided doses spread over the next 3 years. The mandibular

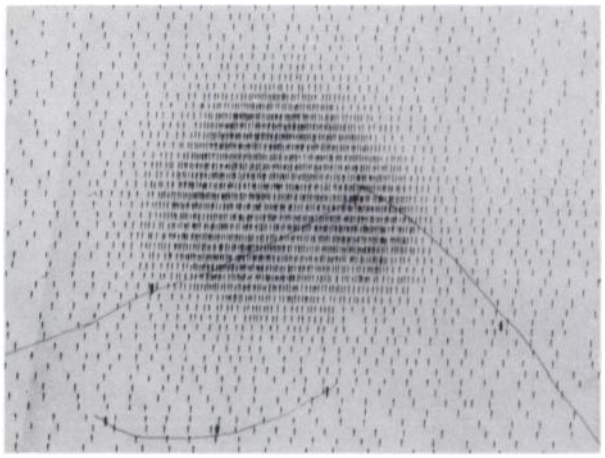

**FIG. 1.** Case 1. Scan of upper abdomen after tracer dose of 1.1 mCi of $^{131}$I-sodium iodide shows area of good uptake in epigastrium.

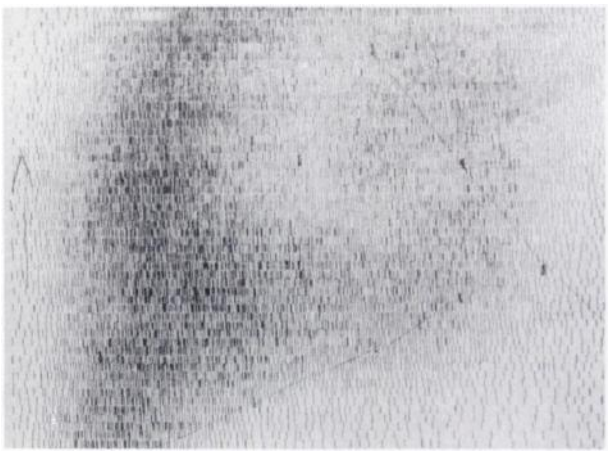

**FIG. 2.** Case 1. Liver scan with $^{131}$I-rose bengal. A "cold" area is seen in epigastric region.

Received Jan. 30, 1975; revision accepted April 11, 1975.

For reprints contact: R. D. Ganatra, Bio-Medical Group, Radiation Medicine Centre, Tata Memorial Hospital, Parel, Bombay-12, India.

swelling became smaller and painless, but the patient developed pulmonary and other bony metastases. She received 2,200 rads of deep x-ray therapy to the dorsolumbar spine. The patient's general condition then suddenly deteriorated and she died 6 months later.

During the entire course of her illness, the patient did not have any symptoms pertaining to liver metastasis.

A whole-body scan showed total ablation of thyroid tissue in the neck. When substitution therapy was withheld for as long as 4 months, hypothyroidism never occurred.

**Case 2.** A 58-year-old woman had sustained a pathologic fracture of the left femur in January 1974 due to metastasis from thyroid cancer. She had a total thyroidectomy on February 15, 1974. Follicular carcinoma was the pathologic diagnosis. She was then treated with 3,000 rads to the femur.

The patient was emaciated and anemic. Her left leg was edematous, discolored, and painful. The rate of her tachycardia was 120/min. As a tracheostomy tube was in situ, the thyroid could not be palpated. There was no palpable enlargement of the cervical lymph nodes. Abdominal examination was negative.

Laboratory studies revealed a hemoglobin of 8.8 gm% and white blood cell count of 5,200/mm$^3$. Liver function tests were within normal limits. A radiologic bone survey showed multiple pulmonary and skeletal metastases.

A whole-body scan with 2.2 mCi of $^{131}$I disclosed a few areas of radioiodine concentration: the thyroid region, nasion, lower chest, and left knee joint. Radioiodine uptake at 48 hr by the thyroid was 1.54%.

The patient was admitted on April 22, 1974 for radioiodine therapy but in view of her hematologic status—hemoglobin 7.2 gm and white blood cell count of only 2,800—radioiodine therapy was postponed.

On May 2, 1974 the patient became febrile. A fullness in the epigastrium was felt although no definite mass was palpable. There was no tenderness in the epigastrium. Jaundice was noticeable 5 days later.

Urinalysis showed the presence of bile salts and bile pigments. Serum bilirubin was 6.8 mg%, SGOT 250 units/ml, and SGPT 381 units/ml.

Liver scan done on May 14, 1974 with $^{99m}$Tc-sulfur colloid demonstrated a "cold" area in the left lobe (Fig. 3). The scan was repeated with 4 mCi of $^{131}$I. Figure 4 shows the accumulation of radioiodine in the area that was "cold" when scanned with $^{99m}$Tc-sulfur colloid.

The patient's jaundice cleared 20 days later but the fullness in the epigastrium persisted. Treatment with 170 mCi of $^{131}$I followed on July 3, 1974.

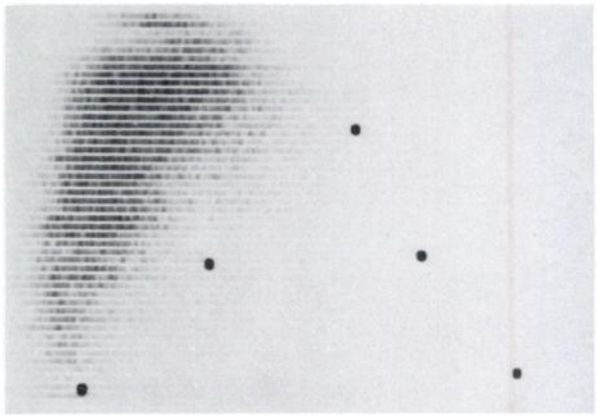

**FIG. 3.** Case 2. Liver scan with $^{99m}$Tc-sulfur colloid. "Cold" area is suggested by almost negligible concentration of radiopharmaceutical in left lobe and epigastric region.

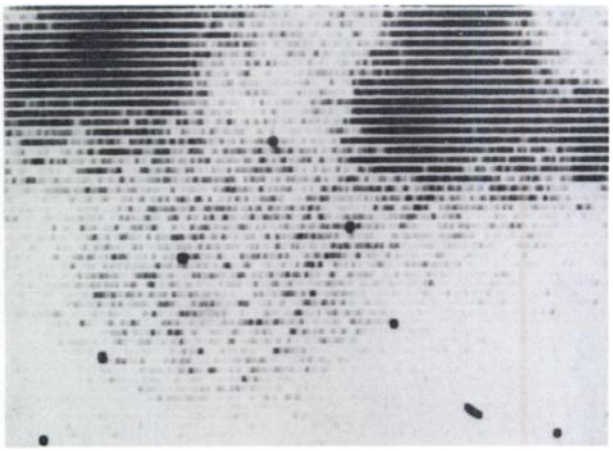

**FIG. 4.** Case 2. Scan of upper abdomen after 4.0 mCi of $^{131}$I-sodium iodide. Patchy distribution of radioiodine in epigastrium and left lobe corresponds to "cold" area in Fig. 3. This scan also shows concentration of radioiodine in metastases in thoracic cage.

## DISCUSSION

There are some common features in the two patients discussed here: both are women over 50 years in age and both have follicular carcinoma of the thyroid with multiple bone metastases. In the first patient there were no symptoms to suggest liver involvement while in the second, there were many clinical features suggesting pathologic conditions of the liver other than metastases.

Both patients remained euthyroid even when kept without thyroxine supplements after total thyroid ablation, suggesting that metastases in the liver were producing adequate quantities of thyroid hormone. Failure to discharge radioiodine from the hepatic lesion in one patient after administration of perchlo-

rate suggests organic binding of iodine in the liver metastasis.

The practice of obtaining either a whole-body scan or a profile scan of the distribution of radioiodine in the body is to be highly recommended for detecting functional metastases of thyroid carcinoma. Radioactivity in the gastrointestinal tract and the high concentration of hormonal radioiodine in the normal liver even 48 hr after the dose make it difficult to discern an area of increased concentration in the liver. However, correspondence of this positive area on the radioiodine scan with a negative area on a routine $^{99m}$Tc-sulfur colloid liver scan is helpful in detecting functional thyroid metastases in the liver.

REFERENCES

1. STUDER H, VERAGUTH P, WYSS F: Thyrotoxicosis due to a solitary hepatic metastasis of thyroid carcinoma. *J Clin Endocrinol Metab* 21: 1334–1338, 1961

2. SILVERBERG SG, HUTTER RUP, FOOTE FW: Fatal carcinoma of the thyroid: histology, metastases, and causes of death. *Cancer* 25: 792–802, 1970

3. SILLIPHANT WM, KLINICK GH, LEVITIN MS: Thyroid carcinoma and death. *Cancer* 17: 513–525, 1964

4. BEIERWALTES WH: Personal communication, 1969