

TUMOR BLOOD-FLOW STUDY TO MEASURE RESPONSE TO TREATMENT

Charles K. Tashima, Winfred Y. Lee, and Alvin Leong
St. Francis Hospital, Honolulu, Hawaii

The response to radiation therapy has been correlated with changes in apparent blood flow in a vascular tumor.

The accurate measurement of tumor is essential in assessing response to therapy in cancer patients. Methods employed include serial x-rays of radiologically demonstrable lesions, serial ruler measurements of palpable or visible masses, and serial scintiscans of bone and liver. We report an experience with ^{99m}Tc blood flow study of a vascular metastasis from carcinoma of the prostate.

CASE REPORT

A 69-year-old man with carcinoma of the prostate and osseous metastases of 2 years duration presented with a large mass over the right scapula. The mass was warm and tender and vascular systolic bruits were audible over the mass. Aspiration biopsy revealed nests of undifferentiated malignant cells.

Radiotherapy was administered to the area using ^{60}Co with a single posterolateral field measuring 20×15 cm. The mass received a tumor dose of 4,000 rads in 3 weeks at a depth of 10 cm. Progressive shrinkage of the tumor mass was evident over the ensuing weeks.

BLOOD FLOW STUDY

It was assumed that the injection of ^{99m}Tc into the

vascular system would remain within this compartment if a study was conducted over a short period of time without definite tumor accumulation or absorption of the isotope. The Dynacamera, tape recorder, rapid sequence films, and data processing were used to evaluate the isotope accumulation.

The ^{99m}Tc was injected into the right arm intravenously and was found to accumulate in the large tumor mass. The quantitative data suggested a half-life of 30 min in the tumor. The isotope completely disappeared from the tumor site suggesting that the activity was due to the presence of a vascular tumor and not due to tumor accumulation of the isotope. A repeat study was performed 3 weeks after completion of radiotherapy by which time the mass had decreased in size. The post-treatment study with ^{99m}Tc demonstrated a much smaller mass with a transit time of 15.6 sec.

DISCUSSION

Tumor blood-flow studies with ^{99m}Tc appear to be another method of estimating the size of a vascular tumor and when repeated after therapy may provide a useful measure of response. This method may be especially valuable for soft-tissue masses which cannot be visualized by other means.

Received April 30, 1973; original accepted Dec. 31, 1973.

For reprints contact: Charles K. Tashima, St. Francis Hospital, 2260 Liliha St., Honolulu, Hawaii 96817.