

"Heat Therapy Being Used Against Malignant Tumors"

By Robert Pear

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Heat therapy is being used to selectively destroy malignant tumors and to control otherwise untreatable cancers, according to a scientific report published today in the Journal of the American Medical Association.

The technique, still in an experimental stage, was said to have reduced or substantially eliminated cancer in 21 patients at the Veterans Administration Hospital and the Downstate Medical Center of the State University of New York, both in Brooklyn.

Dr. Harry H. LeVein, head of the Brooklyn medical team, said in a telephone interview that the heat was

introduced by radiofrequency radiation, in the form of electric current or electric waves from a special radio transmitter.

CANCEROUS tissue, he explained, became considerably hotter than surrounding tissue. The tumor was raised to a temperature of 118 to 120 degrees Fahrenheit, compared with normal body temperature of 98.6 degrees.

"The therapy," LeVein said, "is based on the fact that heat is conducted away from cells by blood supply. The blood flow to a tumor is much less than the blood flow to normal tissues. So heat can't get away from the tumor."

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The Wash. (D.C.) Star (198): A-1 & A-8 (Mon, May 17, 76)

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"The tumor," he said, "gets much hotter than the surrounding tissue until it reaches the point that heat destroys the tumor."

The tumor cells die if kept for a half-hour at about 107 degrees or more, he said.

The 21 patients in the study had a variety of cancers of the lungs, the intestines and the head and neck.

Two National Cancer Institute physicians praised the new technique in an editorial accompanying the report in today's Journal of the AMA. They cautioned that long-term clinical trials of heat therapy, under very careful controls, are needed to determine its value.

THEY ALSO recommended trials of heat therapy in combination with X-rays and drugs, in view of evidence that com-

bined therapy may be superior to single anticancer agents.

LeVein, who is chief surgeon at the Veterans Administration Hospital in Brooklyn, said further tests of heat therapy are planned at several other VA hospitals.

The editorial, by Joan M. Bull and Paul B. Chretien of the Cancer Institute, said "it is clear that heat induces selective lethal injury to malignant cells."

They reviewed past efforts to use heat in treating cancer. They observed that LeVein's technique makes it possible to focus on the tumor without heating the whole body.

Because of the "ingenuity and comparative simplicity" of LeVein's approach, it may be more suited to widespread use than the techniques developed by earlier researchers, the editorial suggests.

LEVEEN SAID that destruction of a tumor by heat therapy may also stimulate

the body's immune-defense mechanism, flooding the body with proteins from the dead tumor that in turn generate antibodies.

The antibodies, he said, could prevent recurrence of the tumor or kill parts of the tumor not already destroyed.

"Radiofrequency therapy consistently resulted in death of cancerous tissue, with minimal destruction of normal tissue," LeVein and his colleagues reported.

Although the surface of a tumor may appear to be laced with blood vessels, LeVein said, the blood usually has low oxygen content.

In addition, he said, blood flow through a tumor is very sluggish, being only 1 to 15 percent of flow through normal surrounding tissue.

BLOOD FLOW through body tissue acts like fluid in an auto radiator, with cooling enhanced when the flow is rapid, he added.

The haphazard growth of blood vessels in a tumor re-

sults in a "disorganized and tortuous pathway with a high resistance" to blood flow, LeVein and his colleagues said.

Interconnections between arteries and veins may short-circuit the distribution of blood in a tumor, they said.

"The larger the tumor size, the greater was the reduction in blood flow," they said.

The impaired blood circulation in a tumor, they said, means the tumor may be relatively deprived of oxygen. Heating a tumor further increases its metabolism and its demand for oxygen, LeVein said.