

Breast Thermography

A Prognostic Indicator for Breast Cancer Survival

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A prognostic classification for thermographic staging of breast cancer has been applied to a cohort of 70 patients from 5040 screenees enrolled in the Albert Einstein Medical Center (AEMC) Breast Cancer Detection Demonstration Project (BCDDP). A diagnosis of breast cancer was established in each case before December 31, 1980. None of the patients have been lost to follow-up which extended from a minimum of 6 to a maximum of 13 years. Survival rates for those with favorable, equivocal, and poor thermographic factors are compared with each other and with results in accordance with tumor-node-metastasis (TNM) classification. As of December 31, 1986, there have been 22 (31.4%) deaths, all attributed to breast cancer. The thermographic scoring system clearly shows shorter survival for patients with poor thermographic prognostic factors, 30% surviving at 5 years and only 20% at 10 years compared with overall survival of 80% at 5 years and 70% at 10 years.

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SURVIVAL RATES of patients with breast cancer have been correlated with a number of prognostic indicators.^{1,2} The presence or absence of axillary-node metastasis in accordance with tumor-node-metastasis (TNM) staging is generally accepted as the best indicator.³ Other important factors that are useful in the estimation of prognosis include pathologic characteristics of lesions, blood vessel and lymphatic invasion, and hormone-receptor status. Investigators continue in their research endeavors to identify biologic markers that may help predict the course of breast cancer and survival in women. Scant attention, particularly in the United States, has been paid to the thermographic evaluation of the breast as an additional indicator to estimate prognosis.⁴ Gros *et al.*,⁵ in a study carried out on 779 cancers, correlated thermographic breast evaluation with clinical staging according to the TNM classification and found that survival at 3 years was noticeably better in patients with normal or minimal thermal abnormalities in each of the stages from T0 through T4 compared with patients with more advanced thermographic abnormalities. This thesis has been supported by other investiga-

tors^{6,7} who believe that pretreatment thermographic evaluation is an important indicator of the eventual behavior of any human breast cancer and that the "thermographic stage" is as important as the anatomic stage. We present our experience with a small but well-defined group of patients, all of whom had breast thermographic evaluation done at the same time as the establishment of a definitive diagnosis of breast cancer before December 31, 1980 and who were followed for varying periods of time through December 31, 1986 for a minimum of 6 and a maximum of 13 years.

Patients and Methods

The Albert Einstein Medical Center (AEMC) Breast Cancer Detection Demonstration Project (BCDDP) was one of 29 centers jointly funded by the National Cancer Institute and the American Cancer Society in 1973. Asymptomatic women between the ages of 35 and 74 years were invited to participate in a 5-year screening program and undergo, in addition to a detailed history and physical examination, mammography and breast thermography. The three modalities were performed independently of each other, and the results of each were recorded without knowledge of the others. Physical examination was the responsibility of the members of the surgical department of the hospital; mammography was performed with dedicated equipment using the low-dose film-screen technique⁸ and interpreted by qualified radiologists; and thermographic images were obtained electronically using the AGA 680 instrument (AGA Thermovision, AGA Corporation, Secaucus, NJ), recorded

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