Prognosis of breast cancer evaluated from the heatpicture

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SUMMARY. Women with breast cancer during a five year period 1966-70 were followed up. With strict criteria for measurable temperature differences, proven metastases of actual tumour death from cancer and its metastases, 67 cases out of 195 were selected. These were grouped depending on tumour size T **1-3 and** axillary nodes N O-1. More advanced cases were excluded. **There were also** four age groups. A clear correlation **is seen between increased beat and prognosis, not only between different** groups, but also inside them. It is therefore suggested **that tbe information from the thermograms** should **be used** in planning **the** preventive treatment for metastases.

Key words: thermography, prognostic **assesment.**

DEFINITION

The general meaning of prognosis is in breast cancer an evaluation of our possibility of survival. **To** estimate the survival time for a breast cancer patient the first time we see her, is almost impossible. However all our planning for treatment is built up on such an estimation. It might be better to grade the severity of the tumour after the onset of the first remote metastases. Some patients die shorty after this onset in spite of all treatment given, others can live for decades when the tumour is sensitive to hormonal treatment. When untreated the prognosis for these two groups should have been the same.

BACKGROUND

The primary treatment of « early » cases is in most countries the same with different combinations of surgery and radiotherapy. There have been very slight alterations in the final results depending on changes in these combinations. It is assumed that micrometastases have already been thrown off by the majority of tumours at the time of primary surgery. It is known from experiments with micrometastases in animal tumours that adjuvant cytotoxic chemotherapy can improve the survival rate. Preliminary reports, especially from Italy, indicates that a combination of different such drugs, given in repeated periods, also has a good effect in human beings. Endocrine therapy is the first drug of choice at the time of the first metastases. The effect can be estimated and the patient selected with the aid of receptor assay on samples from metastases. Primary assay can be done on all operated cases. Tumours likely to respond to endocrine therapy are thus identified. These amount to seventy per cent.

Such an identifying test is not available for cytotoxic therapy. The side effects of these drugs are severe and for some patients so severe that « the quality of life » under treatment must be weighed against the expected risk and effect of treatment. It is therefore necessary to look through our sources for information available at the time of first diagnosis of a tumour to see if there are signs of malignancy, that may be combined with the prognosis. The T N M - system is of course the first source of information, but inside each group there are great variations depending to age, immunological status and more uncertain factors such as spreading ability and activity of the tumour. Some of these can be estimated from the histo-pathological findings, but also from radiological signs obtained from mammography, xerography and thermography.

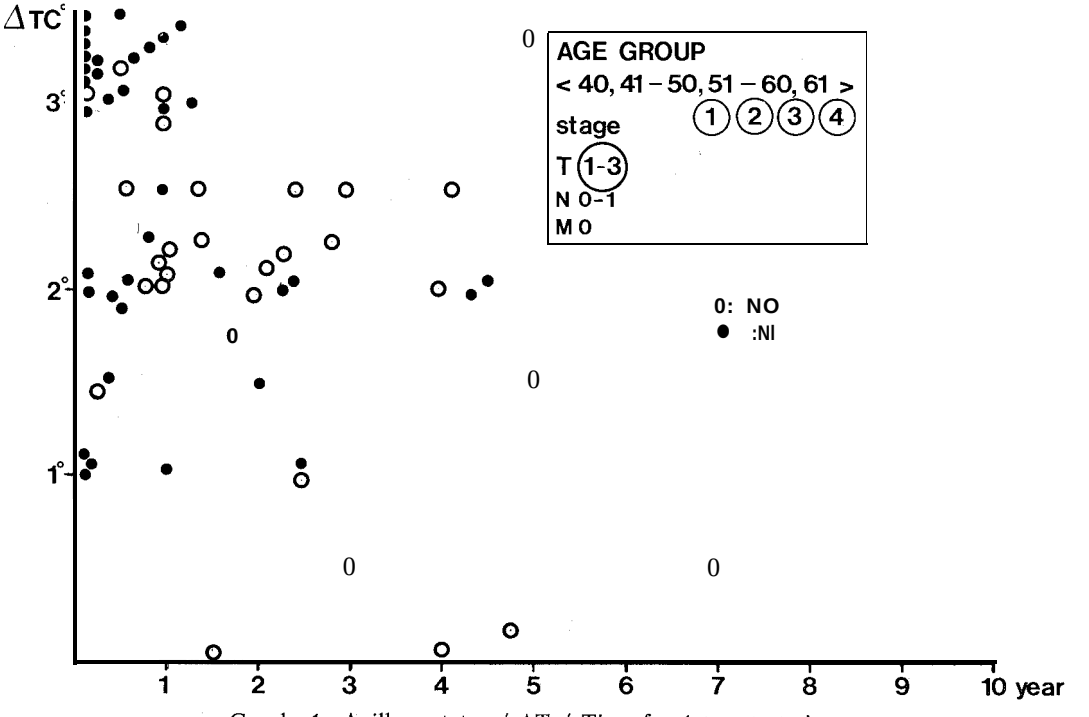
MATERIALS

In this retrospective study only measured temperature differences between symmetrical areas in two breasts seen on thermograms is used and correlated to the primare classification after the TNM-system (Graph 1). The thermograms are taken on women during the five year period 1966-70 and these women have later died in metastases from their carcinoma. The follow up time is thus seven to eleven years and of course several cases had to be excluded depending on lack of information. Cases with cancer in a remaining breast had also to be excluded as temperature difference could not be measured. Patients with simultaneous doublesided proven cancer were also excluded, meanwhile those with a suspect, but not proven doublesided cancer are in the material resulting in a perhaps false low difference for these cases.

Most cases are from a comparative study between clinical judgement, mammography, thermography and histo-pathological findings in needle biopsy and excision. The thermograms were generally taken by assistants, the site of the actual lump being unknown to them and also to the examiner of the thermograms. Only dubious cases were selected for the study and the correlation between lump, warm area and histopathological findings was not done until the examination was finished. Out of 195 women who had died since this examination, 128 cases had to be excluded as they did not fall in the groups Tl - 3 and N: 0 - 1. They might have had another carcinoma, had hormonal treatment or cytotoxic drug before metastases had been proven, or the true reason for death unproven.

METHODS

The primary classification was made by experienced clinicians and the tumour measured in cm, however sometimes measures like « size of a walnut » appears and has to be translated in ctn. The primary treatment should be operation and/or radiotherapy only. Thereafter repeated controls should follows,



Graph. 1. Axillary status / ΔT / Time for 1st metastasis.

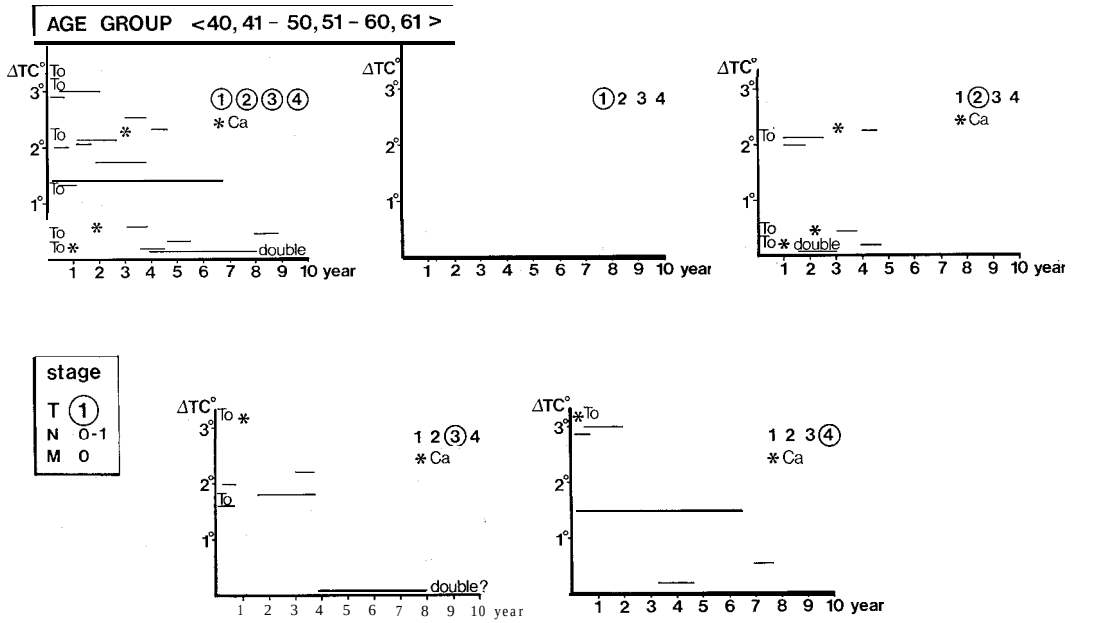
local recurrence is not considered as metastases. The day for the first remote metastases is fixed as the day it was proven with x-ray or needle biopsy. The choice of age categories with limits in fourty fifty and sixty, depends on the different host-tumour relationship before and after the menopause.

RESULTS

When plotting the obtained temperature differences in the three T-diagrams, one finds, as expected, that the more advanced the tumor, a tendency within each T-group, for << the warmer the tumor the worse the prognosis >>.

DISCUSSION

From the thermograms, information is obtained about the nature of the cancer not given by any other method. The two older categories in T 3 have generally been treated in the same way. Receptor assay was not available at that time, so hormones were given as a first attempt to stop the growth and the patient was followed with more frequent controls.

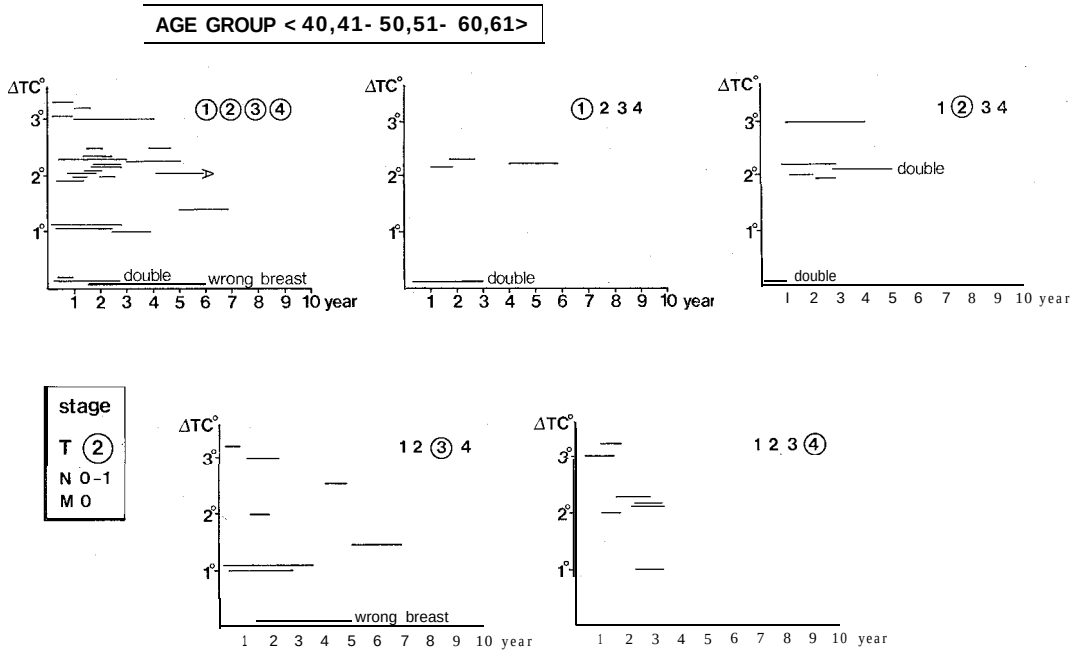


Graph. 2. Tl, NO-l, MO Stage: Cases.

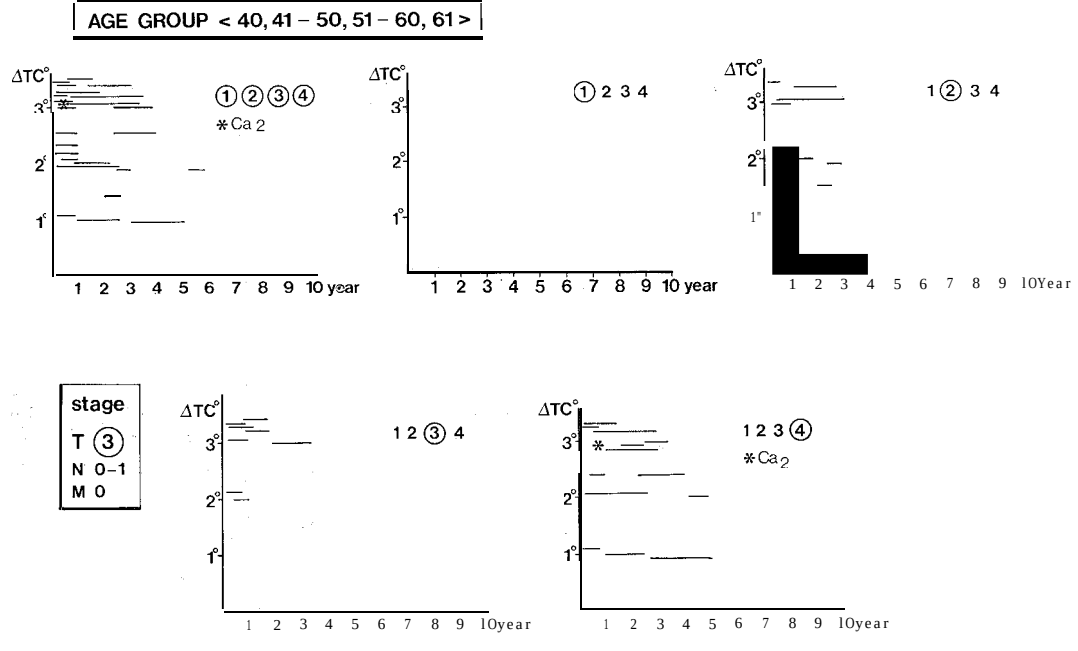
the greater the temperature differences (Graph 1, 2, 3). Certainly the depth and site of the tumour also have influenced the picture, but could not be considered in this examination. When splitting up the cases in age categories, the patterns disappeared in some groups, due to insufficient cases. In others, interesting facts appear, especially in the two oldest groups of T3, where those between fifty and sixty and with the highest temperature differences metastatise earlier and have a shorter survival time. Those aged more than sixty metastatise some years later and have also a longer survival time. Apart from some spurious cases there is The effect of hormones is generally slow and in the younger group the spread and growth of metastases perhaps was too fast to be stopped by this therapy. In older women the growth is from the beginning slower, so there is time for hormones to act and stop the growth. Several of the cases excluded from this examination should have been in this group, but survived for several years and died from other diseases.

CONCLUSION

When discussing the preventive treatment of micrometastases with cytotoxic chemothera-



Graph 3. T2, NO-l, MO Stage: Cases.



Graph 4. T3, NO-l, MO Stage: Cases.

py, the interest in this examination is focused on one special group: that is the women in T 3 aged 51-60 years with warm tumors. Even when the receptor essay is positive, one should start with hormones combined with intermittent cytotoxic therapy. Thus one can expect a delay in the onset of metastases and meanwhile the effect of the hormones increases. In the other groups with lower risk, one should consider the side effects of the currently available cytotoxic drugs and the heat-picture can be a very helpful in the decision.