Use of thermography in the differential diagnosis of phylloides tumour

Thermography can be used as a method of diagnosing breast masses. We report our results of its use in the differential diagnosis of fibroadenoma from phyllodes tumours (n=47 and 20 respectively). Thermographic resolution (Th) and the difference in temperature between the tumour and a similar zone in the contralateral breast (δ₂) were compared. Thermograms were class Th1 (with a similar thermal pattern in both breasts without hypervascularization or hot points) and Th2 (with hypervascularization or a hot area with a thermal difference with the same area in the opposite breast (δ₂) of less than 2°C) in most (95.7% per cent) of the patients with fibroadenoma and were class Th3 (having one or more pathological sign) in 85 per cent of the patients with phyllodes tumours. Patients with phyllodes tumours had a mean δ₂ of 2.99°C whereas most of the patients with a fibroadenoma showed no difference in temperature. Their mean δ₂ was 0.2°C (P<0.0005).

We conclude that thermography helps in differential diagnosis between a fibroadenoma and a phyllodes tumour.

Keywords: Thermography, phyllodes tumour, fibroadenoma

Phyllodes tumours of the breast are clinically benign but can recur locally and metastasize if sarcomatous. Diagnosis is often only made on histology, since other methods such as mammography, sonography and fine needle aspiration are associated with a poor diagnostic discrimination. Histologically, phyllodes tumours are usually benign but some authors describe local recurrence and metastases.

Although phyllodes tumours and fibroadenomas have a similar fibroepithelial composition, phyllodes tumours have a different stromal composition with greater mitotic activity. This difference in growth patterns probably correlates with increased metabolic activity and this, in turn, may be associated with different heat generation.

A prospective study was therefore undertaken examining thermography in the preoperative assessment of benign breast tumours evaluating thermographic differences between phyllodes tumours and fibroadenomas.

Patients and methods

Between March 1980 and August 1989 a group of 10134 women were examined at the Breast Diseases Diagnostic Center of Concepción. Mammography, thermography by liquid crystal plates and cytology by fine needle aspiration were carried out on all women in whom a breast mass was found. All patients with a histological diagnosis of phyllodes tumour (20 patients) were compared with 47 women with a fibroadenoma selected taking all patients with this diagnosis during a period of 12 consecutive months.

Thermograms were divided into five categories characterized as: Th1, similar thermal pattern in both breasts without hypervascularization or hot points; Th2, presence of hypervascularization or a hot area with a thermal difference with the same area in the opposite breast (δ₂) of less than 2°C; Th3, existence of a hot area with a δ₂ from 2°C to 2.5°C or vascular asymmetry; Th4, appearance of widespread heat with δ₂ higher than 2°C or a single hot point with δ₂ higher than 2.5°C or disordered hypervascularization; Th5, presence of more than one of the preceding signs. Grade Th1 was considered normal, grade Th2 corresponded to benign pathology, grade Th3 was suspicious and grades Th4 and Th5 were called 'exothermic' and considered as possibly malignant disease.

The patients were grouped according to their histological diagnosis, their thermographic grade and the δ₂ of any hyperthermic areas if they were present.

Mean values were compared using a non-parametric Wilcoxon test for independent samples.

Results

Relationship between thermographic and histological diagnosis

Thermography was normal or grade Th2 in most of the patients with fibroadenomas (Figure 1). In only two patients was an abnormal thermogram obtained. In patients with phyllodes tumour thermograms were 'exothermic' in all but three cases (one Th1, one Th2 and one Th3). The patient with a Th2 thermogram had a benign phyllodes tumour, according to a modified method of grading adopted by Norris and Taylor, but had local recurrence 28 months after initial conservative treatment and subsequently died with metastases.

Thermal differences between points of both breasts

In most patients with fibroadenoma no difference in temperature between breasts was demonstrated. Only two patients had a small thermal difference (δ₂ = 0.8°C). Of the two patients with thermography class Th5, one had a δ₂ of 3.5°C and the other had δ₂ of 6.4°C. Patients with phyllodes tumours had a mean δ₂ of 2.99°C and patients with fibroadenoma a

Figure 1: Distribution of patients according to thermographic diagnosis.

- fibroadenoma; □, phyllodes tumours