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Use of thermography in the differential diagnosis of phylloides tumour

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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 phylloides 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* (δ_2) *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* (δ_2) *of less than 2°C) in most (95·7 per cent) of the patients with fibroadenoma and were class Th5 (having one or more pathological sign) in 85 per cent of the patients with phylloides tumours. Patients with phylloides tumours had a mean* δ_2 *of 2·99°C whereas most of the patients with a fibroadenoma showed no difference in temperature. Their mean* δ_2 *was 0·2°C* ($P < 0·0005$). *We conclude that thermography helps in differential diagnosis between a fibroadenoma and a phylloides tumour.*

Keywords: Thermography, phylloides tumour, fibroadenoma

Phylloides tumours of the breast are clinically benign but can recur locally and metastasize if sarcomatous[1,2]. 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[3–7]. Histologically, phylloides tumours are usually benign but some authors[2,8] describe local recurrence and metastases.

Although phylloides tumours and fibroadenomas have a similar fibroepithelial composition, phylloides 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 phylloides tumours and fibroadenomas.

Patients and methods

Between March 1980 and August 1989 a group of 10 134 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 phylloides 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[9] 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 (δ_2) of less than 2°C; Th3, existence of a hot area with a δ_2 from 2°C to 2·5°C or vascular asymmetry; Th4, appearance of widespread heat with δ_2 higher than 2°C or a single hot point with δ_2 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 δ_2 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 phylloides 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 phylloides tumour, according to a modified method of grading adopted by Norris and Taylor[10], 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 ($\delta_2 = 0·8$°C). Of the two patients with thermography class Th5, one had a δ_2 of 3·5°C and the other had δ_2 of 6·4°C. Patients with phylloides tumours had a mean δ_2 of 2·99°C and patients with fibroadenoma a

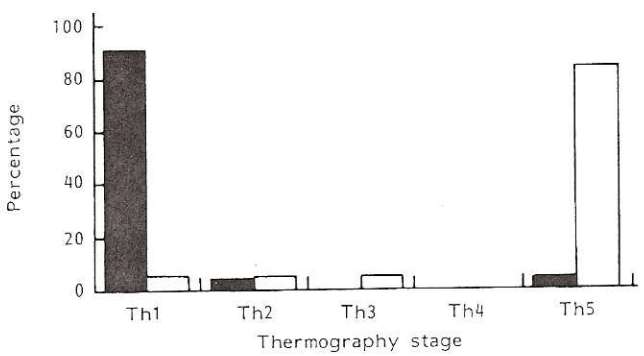

Figure 1 *Distribution of patients according to thermographic diagnosis.* ■, *fibroadenomas;* □, *phylloides tumours*