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Clinics in Diagnostic Imaging (35)

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Fig 1 – Bilateral craniocaudal mammograms.

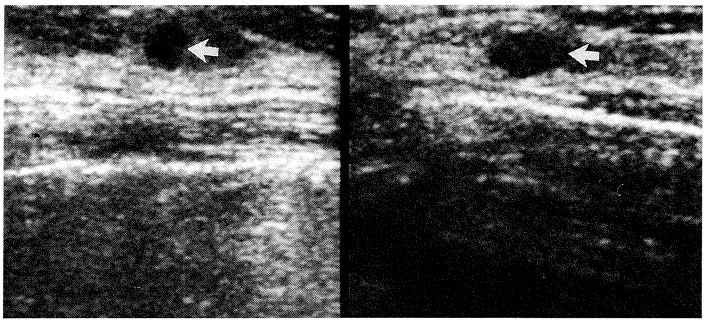

Fig 2 – Ultrasound scans of the breasts.

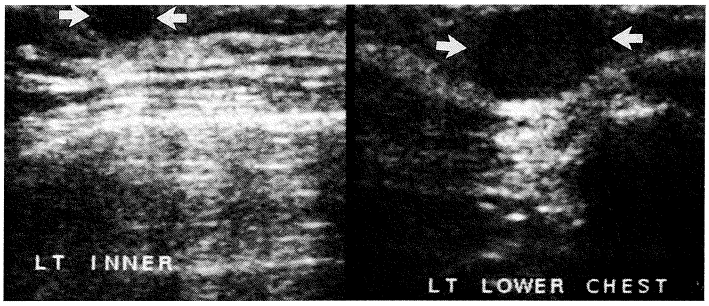

Fig 3 – Ultrasound scans of the (A) left inner breast and (B) left lower chest wall.

CASE PRESENTATION

A 46-year-old woman presented with multiple skin lumps and right hip pain for two months. On physical examination, the patient was noted to be pale. There were multiple small nodules in the skin over the lower chest and abdominal wall and one in the lower inner aspect of the left breast. Multiple small nodules were palpable in both breasts. What do the mammograms (Fig 1), ultrasound scans (Figs 2 and 3) and hip radiograph (Fig 4) show?

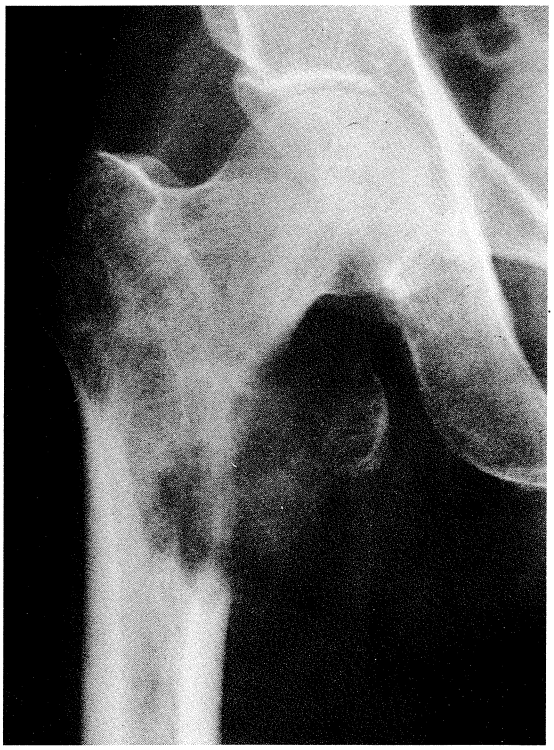

Fig 4 – Right hip radiograph.

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IMAGE INTERPRETATION

Bilateral craniocaudal mammograms showed multiple dense circumscribed masses in both breasts (Fig 1). Ultrasound scans revealed multiple solid masses (arrowed) in both breasts (Fig 2), and in the subcutaneous tissue over the inner quadrant of the left breast (Fig 3A) and left lower chest wall (Fig 3B). Right hip radiograph demonstrated an expansile osteolytic lesion in the lesser trochanter of the femur (Fig 4).

DIAGNOSIS

Metastases to the breasts, skin and bone

CLINICAL COURSE

Chest radiograph showed a right-sided extrapleural mass with associated rib destruction. On abdominal ultrasound, an echogenic nodule was present in the right lobe of the liver. Excisional biopsy of one of the subcutaneous nodules over the abdominal wall confirmed the diagnosis of metastatic adenocarcinoma. Barium meal and barium enema were planned to look for the primary carcinoma but the patient refused and she absconded without receiving further treatment.

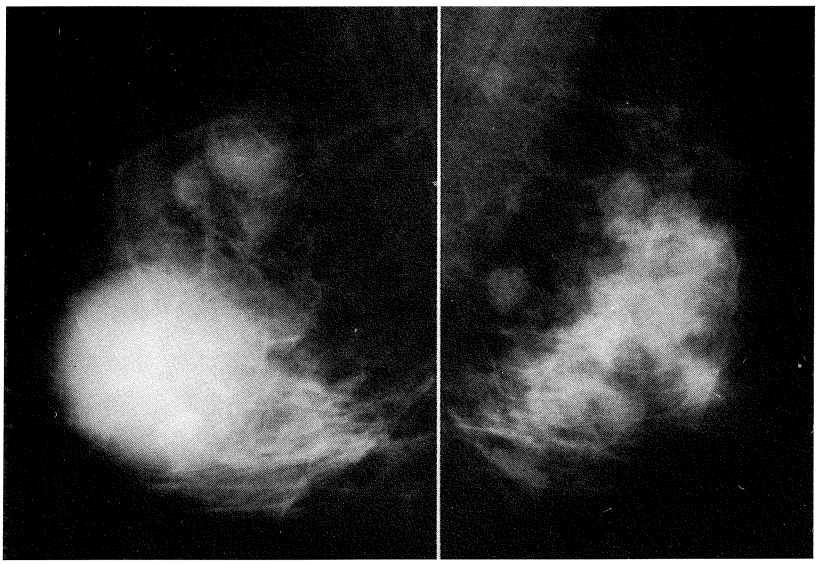

Fig 5 – Bilateral mediolateral mammograms of a patient with multiple cysts show multiple circumscribed masses of various sizes in both breasts.

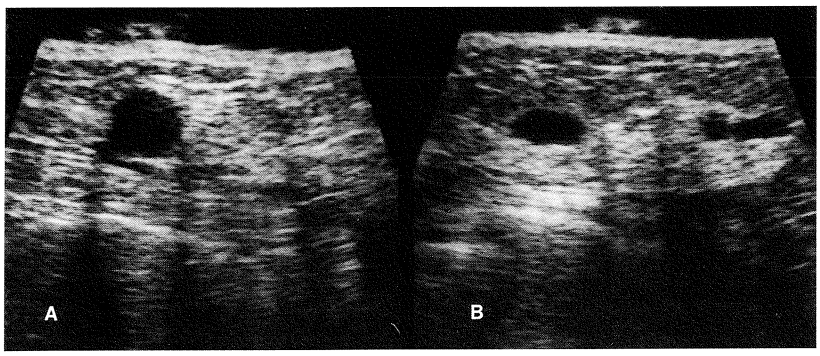

Fig 6 – Ultrasound scans of the (A) right and (B) left breast of a woman with multiple cysts show multiple well-defined anechoic masses.

DISCUSSION

The differential diagnosis of multiple circumscribed masses in the breast includes cysts, fibroadenomas and metastases[1]. Cysts are the most frequently encountered masses in the female breast, occurring with peak frequency in pre-menopausal and peri-menopausal women between the ages of 40 and 45 years[2]. Cysts represent fluid-filled locally distended terminal-duct lobular units and are associated with fibrocystic change in the breast. They are usually bilateral. Multifocal cysts range in size from microscopic to grossly apparent ones, and may be symptomatic or asymptomatic. They appear on mammograms as round or oval well-circumscribed masses, with well-defined to ill-defined margins completely obscured by adjacent fibroglandular tissue (Fig 5). Ultrasound provides the best means of differentiating cysts from solid masses. They are characterised by smooth, thin-walled, anechoic masses with distal acoustic enhancement[1,2] (Fig 6).

Fibroadenoma is a benign fibroepithelial tumour. It is the most common breast mass in adolescents and women younger than the age of 35 years, rarely developing or growing further after menopause[1]. This tumour is oestrogen-sensitive, and may be enhanced by pregnancy or lactation. Fibroadenomas are multiple in 20% of cases[3]. On physical examination, the tumour is firm or rubbery in consistency and is freely mobile. On mammograms, fibroadenoma is seen as a well-circumscribed mass with round, oval or lobulated borders. Its margins may be well-defined or partially obscured by surrounding fibroglandular tissue (Fig 7).

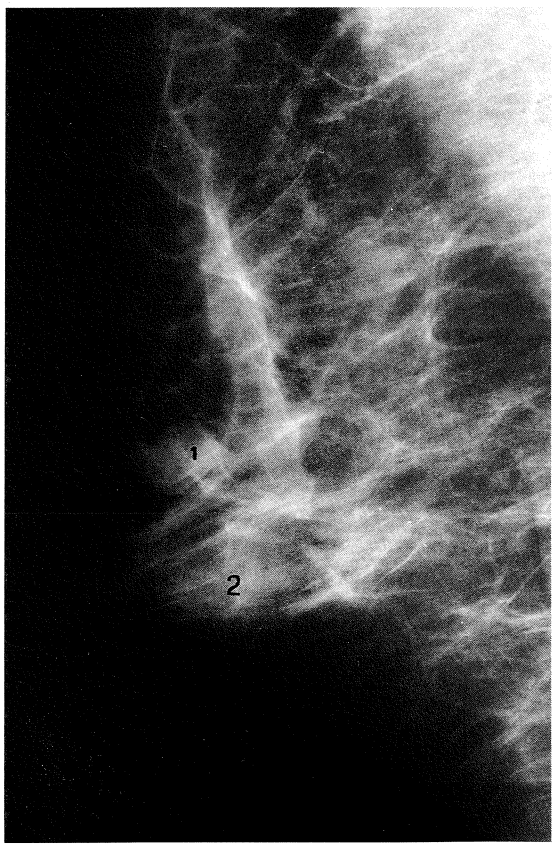

Fig 7 – Right mediolateral oblique mammogram of a 30-year-old woman with multiple fibroadenomas. Two masses are seen behind the nipple. One is well-defined and lobulated (1), while the other has partially-obscured borders (2).

Calcification may occur as part of a degenerative process after menopause and usually begins at the periphery of the mass. Later on, the calcifications become denser and coarser, producing the typical large "popcorn-like" calcification. The soft tissue component of the mass gradually atrophies (Fig 8).

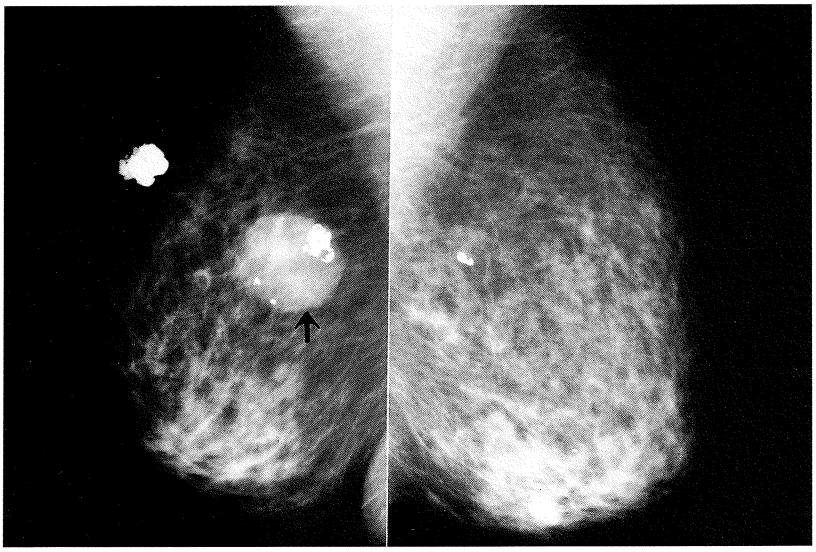

Fig 8 – Bilateral mediolateral oblique mammograms of a 55-year-old woman with multiple calcified fibroadenomas. Multiple coarse "popcorn-like" calcifications are seen in both breasts. These calcifications have almost totally replaced the soft tissue masses from which they originated, except for one in the right breast (arrow).

Metastatic disease to the breast from non-breast primary malignancies is unusual. The reported incidence varies from 1.2% to 6.6% of all breast malignancies[4]. Metastasis to the breast can spread from two routes, namely lymphatic and blood-borne[5]. Lymphatic metastasis is more common and usually occurs from carcinoma of the contralateral breast. The mammographic appearances of lymphatic metastasis consist of skin thickening and increased density of the breast. Lymphoma/leukaemia, melanoma and lung cancer are the three most common blood-borne metastases to the breast, followed by secondaries from ovarian cancer, sarcomas, and gastrointestinal and genitourinary tract tumours[4-7]. Clinically, the metastatic lesions tend to be superficially located and have the same size on palpation as they appear mammographically[4,6].

Breast metastasis may be solitary or multiple, and unilateral or bilateral[4,6-9]. The most common mammographic appearance of a metastatic lesion is of one or more round, discrete nodules in the breast. These cannot be reliably differentiated from benign nodules, such as cyst or fibroadenoma. Ultrasound is helpful in differentiating a cystic from a solid mass. Multiple fibroadenomas are difficult to distinguish from metastases based on the mammographic appearances alone. However, fibroadenomas are less often multiple and usually occur in younger women. Diffuse metastatic involvement of the breast is less frequent than discrete mass(es) but has been reported[10,11]. Calcification in metastatic lesions of the breast is rare except for metastases from ovarian carcinoma[5].

Distinguishing a solitary metastasis from a primary breast carcinoma which has spiculation and microcalcification is generally not a problem. This differentiation is difficult only with circumscribed primary carcinomas such as medullary or colloid carcinomas[5]. Prognosis of patients discovered to have breast metastases is usually poor, as disseminated carcinoma is usually evident at the time of presentation[4,9]. This point is illustrated in our patient where skin, liver and bone metastasis were already present at diagnosis. Metastatic carcinoma to the breast should be suspected in a patient with the combination of a known extra-mammary malignancy and breast mass or masses. The complementary use of mammography and ultrasound is helpful in making the diagnosis. Accurate diagnosis of metastasis to the breast is important in order to avoid unnecessary radical surgery and to provide appropriate systemic therapy.

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ABSTRACT

A 46-year-old woman presented with multiple skin lumps and right hip pain. Multiple nodules were palpable in the skin over the chest and abdominal wall, and in both breasts. Bilateral mammograms showed multiple solid masses, while ultrasound demonstrated multiple subcutaneous nodules. An osteolytic lesion was seen on the right hip radiograph. Excisional biopsy of a subcutaneous nodule revealed metastatic adenocarcinoma. The diagnosis of metastases to the breast is discussed, together with imaging features of other multiple breast lesions, such as fibroadenomas and cysts.

Keywords: Breast tumours, breast metastases, multiple breast lesions, mammography, ultrasound