

Clinics in Diagnostic Imaging (88)

M Muttarak

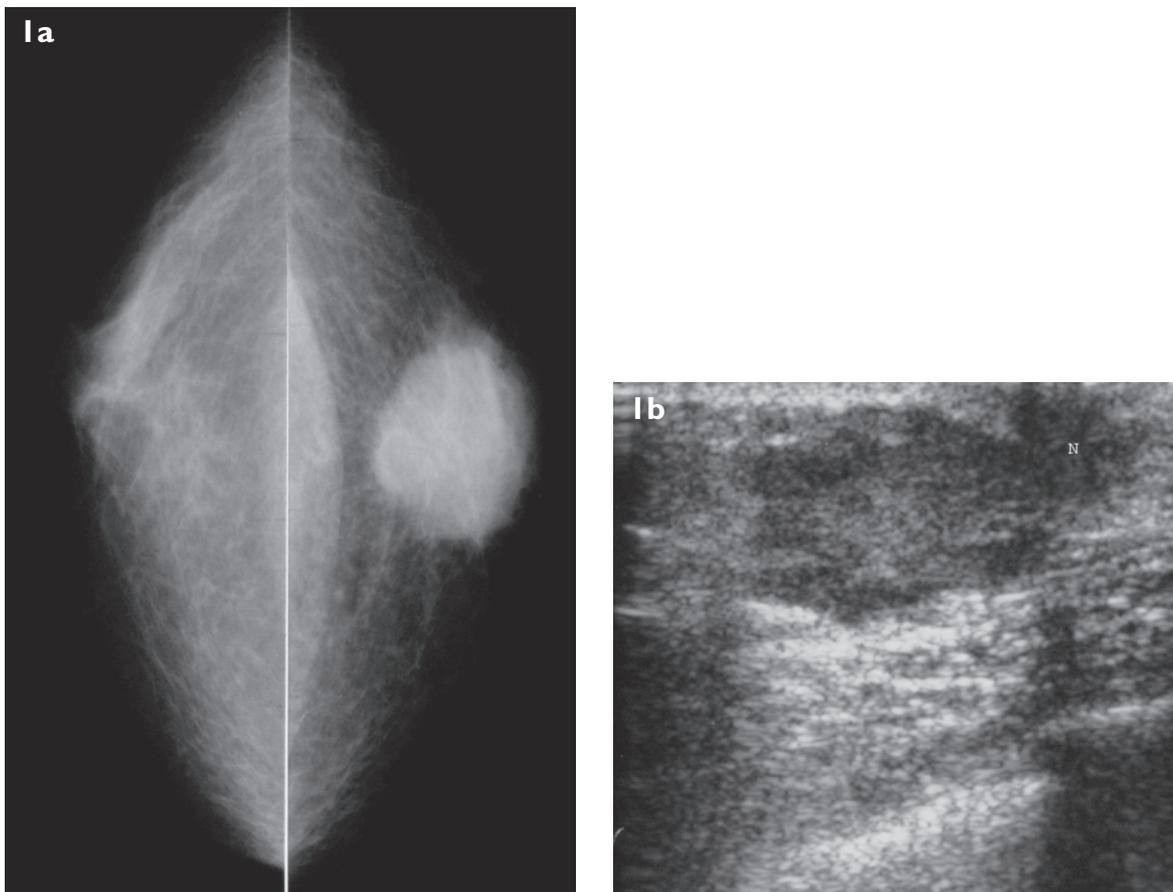


Fig. 1 a) Bilateral craniocaudal mammograms. b) Transverse US scan of the left breast.

CASE PRESENTATION

An 83-year-old man presented with an enlarging painless lump in his left breast for one year. He had history of chronic renal failure but no familial history of breast carcinoma. Physical examination revealed a 2 x 3 cm firm mass at subareolar region of the left breast. The mass was fixed to the overlying skin but it was moveable over the chest wall. There was no nipple retraction, nipple discharge, or axillary

lymphadenopathy. Mild enlargement of the right breast was also noted but no mass was palpable. Laboratory investigations were: haemoglobin of 9.2 g/dl, haematocrit of 26.9%, white blood cell count of $7.8 \times 10^3/\text{mm}^3$, and creatinine of 5.4 mg/dl (normal 0.7-1.5 mg/dl). What do the bilateral craniocaudal mammograms and ultrasonography (US) of the left breast show (Fig. 1)? What is the diagnosis?

Department of
Radiology
Chiang Mai
University
Chiang Mai
Thailand

M Muttarak, MD
Professor

Correspondence to:
M Muttarak
Tel: (66) 5394 5450
Fax: (66) 5321 7144
Email: mmuttara@
med.cmu.ac.th

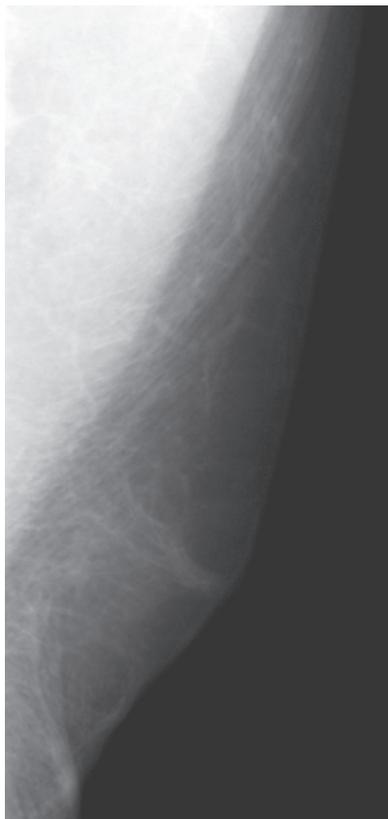


Fig. 2 Normal male breast. Left mediolateral oblique mammogram shows a homogeneously-radiolucent breast with few strands of ducts in the subareolar region.

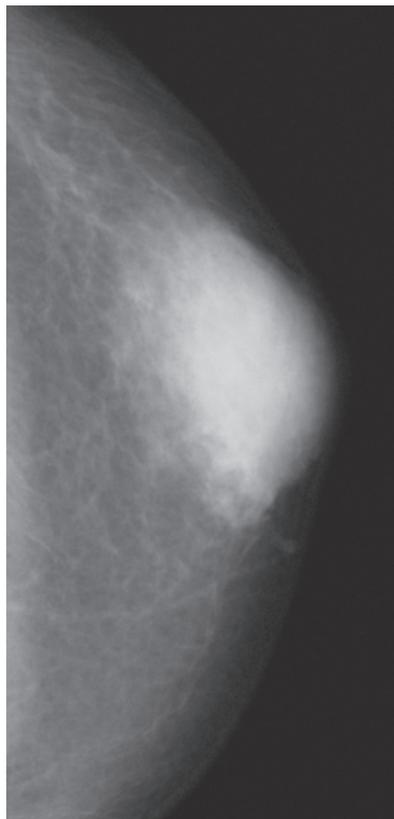


Fig. 3 Nodular pattern of gynaecomastia. A 60-year-old man presented with painful left breast enlargement for two weeks. Left craniocaudal mammogram shows an area of subareolar homogeneously-nodular density.



Fig. 4 Dendritic pattern of gynaecomastia. Right mediolateral oblique mammogram of a 56-year-old man shows an area of glandular density radiating from behind the nipple into the fatty tissue, in a "dendritic pattern".

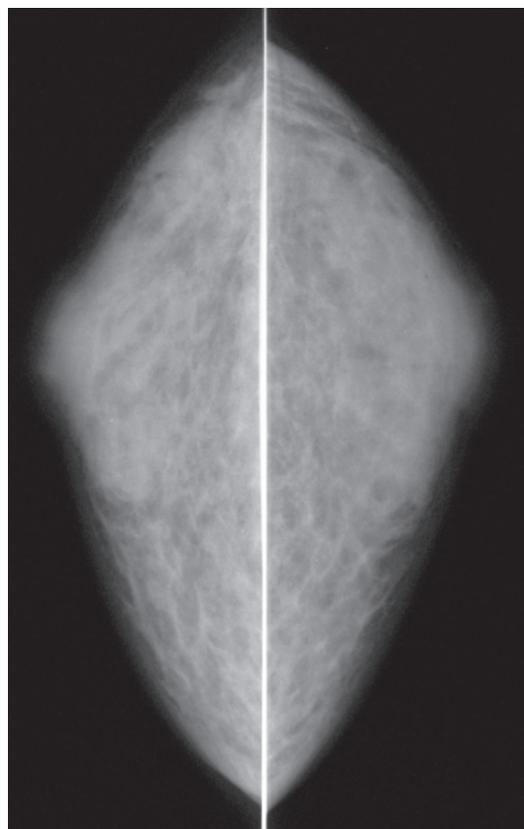


Fig. 5 Bilateral diffuse glandular pattern. A 33-year-old man presented with bilateral breast enlargement. Bilateral craniocaudal mammograms show diffuse breast enlargement with dense parenchyma mimicking the female breast.

IMAGE INTERPRETATION

Craniocaudal mammograms show an ill-defined uncalcified high-density subareolar mass in the left breast. There is minimal fibroglandular density radiating beneath the nipple into the fatty tissue of the right breast (Fig. 1a). US shows an irregular, heterogeneously-hypoechoic mass, eccentrically located deep to the nipple(N), with mild posterior transmission (Fig. 1b).

DIAGNOSIS

Gynaecomastia of the right breast and carcinoma of the left breast.

CLINICAL COURSE

Fine-needle aspiration biopsy was performed on the left breast mass, revealing ductal carcinoma. The patient was advised to have surgery but he refused treatment.

DISCUSSION

The most common cause of breast enlargement in male patients is gynaecomastia⁽¹⁾. Gynaecomastia is not a true tumour, but is an abnormal increase in the stroma and ductal components⁽²⁾. Gynaecomastia occurs mainly in two age groups, namely, adolescent boys and men over 50 years of age. It may be unilateral or bilateral, or bilaterally symmetrical or asymmetrical. The aetiology of gynaecomastia can be grouped into five major categories⁽¹⁻³⁾, namely: 1) hormonal-related to an imbalance in oestradiol-testosterone levels or to dysfunction of the adrenal, thyroid or pituitary glands; 2) systemic disorders such as cirrhosis, chronic renal failure and chronic pulmonary disease; 3) drug induced, e.g. exogenous oestrogen, digitalis, cimetidine, spironolactone, reserpine, thiazide, isoniazid, ergotamine and marijuana, 4) neoplasms such as malignant tumours of the testis, adrenal gland, pituitary, lung and hepatoma; 5) idiopathic.

Although breast cancer is rare in men, it must nonetheless be suspected in every male patient who presents with breast enlargement. Early detection of breast carcinoma in men has been shown to improve the survival rate just as it does in women. Mammography is helpful in differentiating between gynaecomastia and carcinoma. The normal male breast is composed predominantly of fat with few secretory ducts in the subareolar region (Fig. 2). Three mammographical features of gynaecomastia have been described^(1,2). The first pattern is the early nodular pattern of florid phase, which is seen in patients with gynaecomastia of less than one year duration (Fig. 3). The second type is a dendritic pattern of the quiescent fibrous phase (Fig. 4). The third type is a diffuse

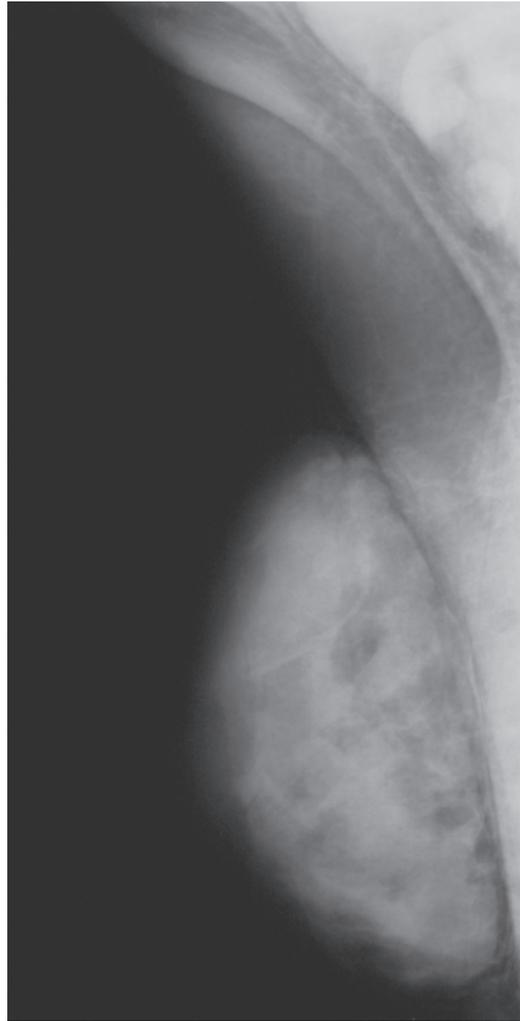


Fig. 6 Unilateral diffuse glandular pattern. A 20-year-old man presented with right breast enlargement. Right mediolateral oblique mammogram shows an area of markedly increased glandular density occupying the entire right breast.

glandular pattern, which mimics the density seen in the dense female breast (Figs. 5 and 6). This latter pattern is commonly seen in patients who have received exogenous oestrogens.

Enlargement of the male breast in obese patients is mainly due to accumulation of fat. This condition is not a true gynaecomastia (pseudogynaecomastia) (Fig 7). Cancer in the male breast usually appears as an uncalcified mass which is either well-defined, ill-defined or spiculated on mammography. Microcalcifications are an unusual finding in male breast carcinoma. If they are present, they tend to be large and round, unlike the punctate and rod-shape calcifications in female breast carcinoma^(1,2,4). The mass is usually located eccentrically in relation to the nipple, in contrast to gynaecomastia which is symmetrical in relation to the nipple. Skin thickening, nipple retraction, and axillary adenopathy can be found in advanced carcinoma (Fig. 8).

The use of US to evaluate breast cancer in men is uncommon^(5,6). Recently, Yang et al⁽⁷⁾ reported the

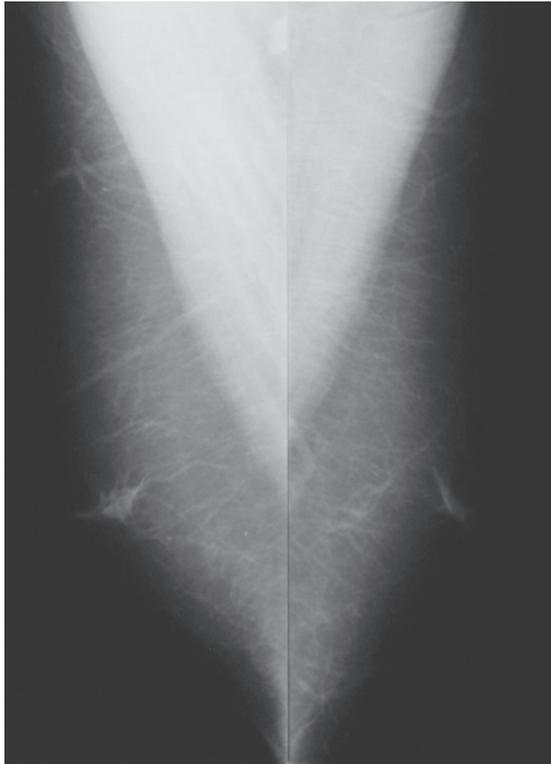


Fig. 7 Pseudogynaecomastia. Bilateral mediolateral oblique mammograms in an obese patient show radiolucent breasts.

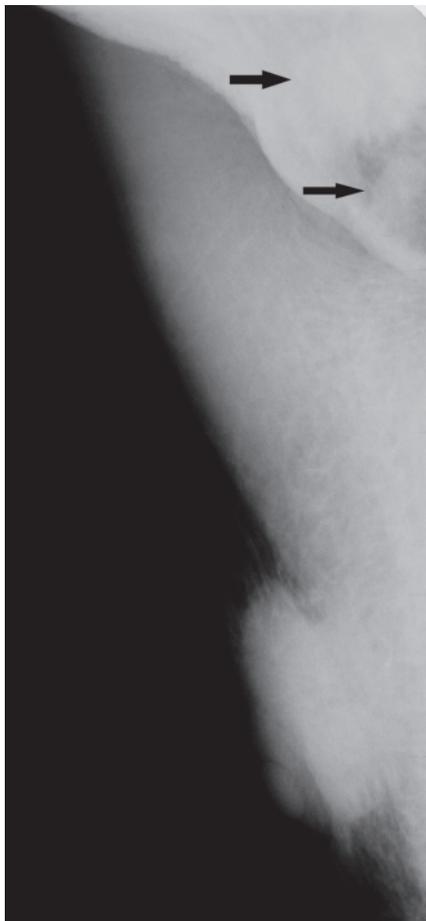


Fig. 8 Advanced male breast carcinoma. Right mediolateral oblique mammogram shows an ill-defined subareolar mass with nipple retraction and enlarged axillary nodes (arrows).

US features of breast cancer in eight men. A complex cystic mass was seen in four of eight lesions. The four remaining solid lesions showed a heterogeneous hypoechoic pattern. Most lesions had irregular or indistinct margins. Six of eight lesions showed posterior acoustic enhancement. They concluded that the US appearance of a complex cystic mass in the male breast should suggest the possibility of malignancy. US features of gynaecomastia include subareolar triangular hypoechogenicity and hyperechoic fibroglandular tissue⁽⁸⁾.

In marked contrast to its counterpart in women, breast carcinoma in men is rare, accounting for less than 1% of all breast cancers and 0.17% of all cancers in men⁽⁹⁾. Breast cancer in men usually occurs after the age of 60, with the peak age group being 60 to 69 years⁽¹⁰⁾. The patients often present as a hard painless mass, usually situated beneath the nipple, and may be fixed to the skin or to the underlying pectoral fascia. Other manifestations include nipple abnormalities, bloody nipple discharge, and axillary adenopathy. Risk factors for development of male breast carcinoma include advanced age, cryptorchidism, testicular injury, Klinefelter's syndrome, familial history of breast cancer, liver dysfunction, and previous chest trauma. Radiation exposure, occupational exposure to electromagnetic field radiation, and germline mutations of the BRCA2 gene also contribute to an increase for breast cancer in men^(2,7,11). The relationship of breast cancer to gynaecomastia is controversial. Although up to 40% of cases of male breast cancers have been reported to be associated with gynaecomastia, no definite evidence has been established^(2,4,12).

Because the normal male breast contains only ducts, most breast cancers in men are either infiltrative ductal carcinoma or ductal carcinoma in situ (DCIS). Pure DCIS without an associated infiltrating ductal cancer is less common. Papillary subtype is the most common histopathological finding in most cases of DCIS in men^(7,13). The remaining special histological subtypes include intracystic papillary, colloid, and tubular carcinoma^(4,7,11). Lobular carcinoma is extremely rare in men⁽¹⁴⁾. The prognosis for males with breast carcinoma is generally regarded as poor. Some of the reasons hypothesised to cause poor prognosis include old age at the time of diagnosis, earlier invasion of the chest wall, and a significantly-delayed diagnosis and treatment^(11,15). Therefore, the presence of any mass in male breast should suggest possible malignancy and should be investigated aggressively. Mammography and US are helpful in differentiating between gynaecomastia and carcinoma.

ABSTRACT

An 83-year-old man presented with a painless lump in his left breast for one year. Mammograms showed an ill-defined uncalcified high-density subareolar mass in the left breast and minimal fibroglandular density radiating beneath the nipple into the fatty tissue of the right breast. US showed an irregular, heterogeneously-hypoechoic mass with mild posterior transmission. The differential diagnosis of breast enlargement in men is discussed. Mammographical and US features of gynecomastia and male breast carcinoma are presented.

Keywords: breast abnormalities, breast, male, breast neoplasms, mammography

Singapore Med J 2003 Vol 44(8):433-437

REFERENCES

1. Dershaw DD. Male mammography. *Am J Roentgenol* 1986; 146:127-31.
2. Appelbaum AH, Evans GFF, Levy KR, Amirkhan RH, Scumpert TD. Mammographic appearances of male breast disease. *Radiographics* 1999; 19:559-68.
3. Cooper R. Mammography in men. *Radiology* 1994; 191:651-6.
4. Dershaw DD, Borgen PI, Deutch BM, Liberman L. Mammographic findings in men with breast cancer. *Am J Roentgenol* 1993; 160:267-70.
5. Jackson VP, Gilmore RL. Male breast carcinoma and gynecomastia: comparison of mammography with sonography. *Radiology* 1983; 149:533-6.
6. Madden CM, Reynolds HE. Intracystic papillary carcinoma of the male breast. *Am J Roentgenol* 1995; 165:1011-2.
7. Yang WT, Whiteman GJ, Yuen EHY, Tse GMK, Stelling CB. Sonographic features of primary breast cancer in men. *Am J Roentgenol* 2001; 176:413-6.
8. Wigley KD, Thomas JL, Bernardio ME, Rosenbaum JL. Sonography of gynecomastia. *Am J Roentgenol* 1981; 136:927-30.
9. Boring CC, Squires TS, Tony T, Montgomery S. Cancer statistics. 1994. *CA Cancer J Clin* 1994; 44:7-26.
10. Yap HY, Tashima CK, Blumenschein GR, et al. Male breast cancer: A natural history study. *Cancer* 1979; 44:748-54.
11. Crichlow RW. Carcinoma of the male breast. *Surg, Gynecol & Obstet* 1972; 134:1011-9.
12. Heller KS, Rosen PP, Schottenfeld D, et al. Male breast cancer: a clinicopathologic study of 97 cases. *Ann Surg* 1978; 188:60-5.
13. Hittmair AP, Lininger RA, Tavossoli FA. Ductal carcinoma in situ (DCIS) in the male breast: a morphologic study of 84 cases of pure DCIS and 30 cases of DCIS associated with invasive carcinoma-preliminary report. *Cancer* 1998; 83:2139-49.
14. Sanchez AG, Villanueva AG, Redondo C. Lobular carcinoma in the breast in a patient with Klinefelter's syndrome: a case with bilateral, synchronous, histologically different tumors. *Cancer* 1986; 57:1181-3.
15. Hodson GR, Urdaneta LF, Al-Jurf AS, Jochimsen PR. Male breast carcinoma. *Am Surg* 1985; 51:47-9.