

---

## CASE REPORT

---

# Primary Tuberculosis of the Breast

JHF Yuen, TPW Lam, L Leong,

*Department of Radiology, Queen Mary Hospital, Hong Kong*

### ABSTRACT

*The mammographic and sonographic features of primary tuberculosis of the breast are discussed, alongside the presentation of a patient with this condition. A definitive diagnosis, based on imaging alone, can be difficult to make due to the variable patterns of presentation. The differential diagnosis includes carcinoma and granulomatous and non-granulomatous conditions of the breast.*

*Key words: Breast, Mammography, Tuberculosis, Ultrasonography,*

### INTRODUCTION

Isolated tuberculosis (TB) of the breast is uncommon, even in developing countries where pulmonary and other forms of extrapulmonary manifestations of TB are endemic. Breast tissue, along with skeletal muscle and spleen, appears to be relatively resistant to tuberculous infection.<sup>1</sup> The incidence of isolated TB of the breast remains low, ranging from 0.10% to 0.52%.<sup>2</sup> However, a recent increase in incidence has been observed in both developed and developing countries, which is thought to relate to migration from endemic areas and the increase in the number of immunocompromised patients.<sup>2,3</sup> The disease usually affects women aged from 20 to 50 years.<sup>2</sup> This article reports an otherwise healthy woman with primary TB of the breast, who presented with typical mammographic and sonographic features of breast TB at an older age than is usual.

### CASE REPORT

A 65-year-old woman presented to the breast surgeon following identification of a left breast lump of a few weeks' duration. The lump was slow in enlarging, with no signs or symptoms of inflammation. Physical examination revealed a 3 cm mobile firm mass at the 10 o'clock position of the left breast. The nipple was retracted, and thickening of the overlying skin was noted. No discharge from the nipple and no sinus opening was

evident. The left axillary lymph nodes were not palpable. Fine needle aspiration was performed under palpation, yielding a small amount of pus-like material.

One week later, ultrasound and mammography were performed. At that time, physical examination showed an erythematous skin bulge, with a sinus opening at the 1 o'clock position of the left breast. The skin around the opening was painless when palpated. The breast lump was still palpable and pus could be extruded from a sinus opening on compression of the lump. Mammography showed a 2 x 2 cm poorly defined, moderately dense, asymmetric density at the upper inner quadrant of the left breast (Figure 1). No internal calcification was noted but a degree of architectural distortion was present. The sinus tract was clearly shown as a dense linear tract connecting the mass to the overlying thickened skin. Ultrasound examination with a high-frequency linear array transducer revealed a well-defined thick-walled lesion with heterogeneous internal echoes, which was partially compressible (Figure 2). A mild degree of posterior acoustic enhancement was demonstrated. A hypoechoic sinus tract was evident from the mass to the skin opening, corresponding to the mammographic findings. Increased vascularity alongside the tract was evident, and skin thickening around the sinus opening was noted. The left axillary lymph nodes were not enlarged.

Cytological examination revealed no malignant cells, but the presence of acid-fast bacilli was noted. Polymerase chain reaction (PCR) testing for TB was positive. The patient had no chest symptoms and chest X-ray

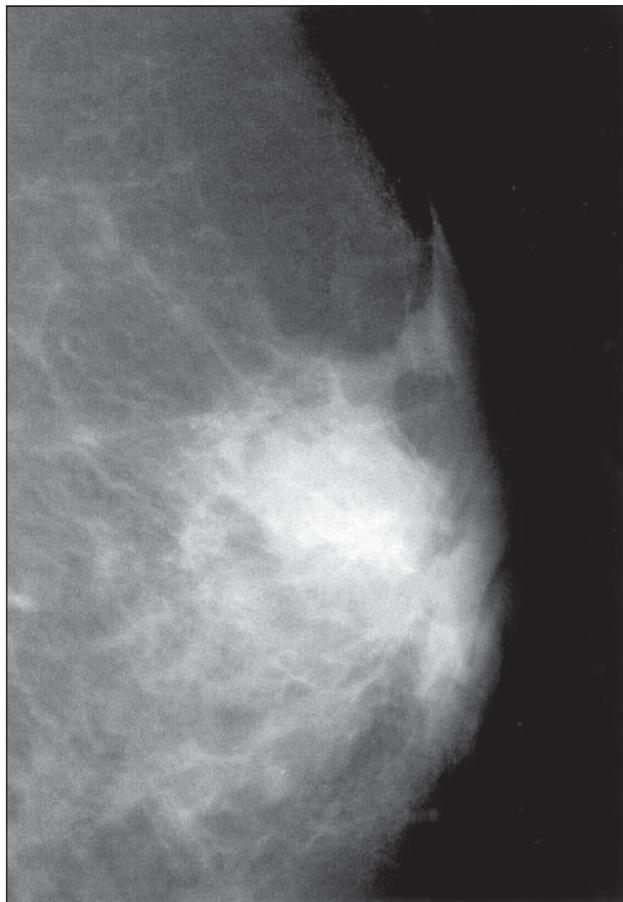
---

*Correspondence: Dr JHF Yuen, Department of Radiology, Queen Mary Hospital, Hong Kong.*

*Tel: (852) 2855 4315; Fax: (852) 2855 5497;*

*E-mail: jybf@yahoo.com*

Submitted: 25 October 2002; Accepted: 8 January 2003.



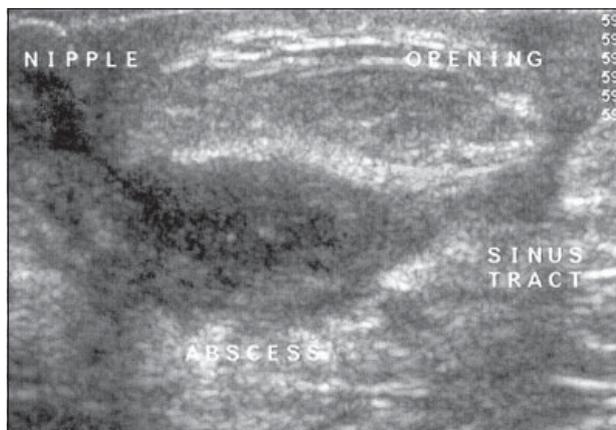
**Figure 1.** Cranio-caudal mammographic view of the left breast shows an ill-defined, moderately dense mass beneath the nipple. Note the soft tissue 'band' passing to the thickened overlying skin, corresponding to the sinus tract.

was normal. There was no evidence of diabetes mellitus. Antituberculous chemotherapy was administered.

## DISCUSSION

Tuberculosis of the breast is usually a disease of women aged between 20 and 50 years. The patient reported therefore presented at an atypical age. The disease rarely affects men and prepubescent girls. Primary and secondary forms of the disease have been described. Primary disease, as in this patient, refers to there being only 1 site of involvement in women who are not immunocompromised. The mode of disease transmission can be haematogenous or by direct extension after contact with infected material through abrasions of the skin of the lactiferous ducts.<sup>2</sup>

The secondary form of the disease, which is more common, is found in patients with documented tuberculous infection elsewhere. Routes of infection for this form of the disease include haematogenous spread, retrograde spread from axillary lymph nodes, and



**Figure 2.** Sonogram of the left breast showing the ill-defined abscess cavity, sinus tract, and opening.

disease extension from lung, pleural, mediastinal, rib, sternal, and articular lesions.<sup>2,4,5</sup> The typical patient is a young woman with a fluctuant central breast abscess or a firm poorly defined mass with associated skin or nipple retraction, suggestive of carcinoma. Purulent discharge from the nipple is common. Fistulas and sinus tracts occur in advanced disease,<sup>2,5</sup> or after needle puncture, as seen in this patient.

Comparison of the clinical, radiological and pathological appearances of the disease suggest that 3 patterns exist — a nodular form, a disseminated form, and a sclerosing form.<sup>2,5</sup> The nodular form is the most common variety and is characterised by a well defined, painless, slow growing caseous lesion in the breast. Involvement of overlying tissue is usually late and it is at this point that the mass becomes painful.

Spontaneous sinus tract formation, skin and nipple retraction, and ulceration are well known late complications. The early formation of a sinus tract in this patient is likely to be related to previous aspiration, resulting in implantation of the contagious material along the needle tract. Mammographically, the lesion appears as a dense, round or oval density, with ill-defined contours, and this appearance may lead to misdiagnosis as carcinoma.

The disseminated form of the disease is characterised by multiple, confluent tuberculous foci of the breast, which may caseate and cause ulceration and numerous discharging sinuses. The breast appears dense and the skin is thickened, tense, and painful. Mammography clearly shows the diffuse thickening of the skin, which is similar to that seen with inflammatory cancer. The axillary lymph nodes are frequently affected.

The sclerosing form of the disease tends to occur in older women, and represents excessive fibrosis rather than a caseous process. Progress is slow and suppuration is rarely seen. The entire breast becomes hard because of the dense fibrous tissue, and the nipple is retracted, making this form of the disease indistinguishable from scirrous carcinoma. Mammography demonstrates the increased density and homogeneity of the mammary gland.

Although 'skin bulge' (a bulging of the skin overlying the lesion), and the 'sinus tract sign' (a dense linear tract connecting a mass to a localised area of skin thickening) have been described as specific for mammary tuberculosis,<sup>3</sup> it is likely that any abscesses with a tendency to sinus formation could produce a similar appearance. Such conditions include fungal infections and other granulomatous infections, as well as non-infectious granulomatous mastitis.

Ultrasound is useful for characterising the ill-defined densities shown on mammography by excluding solid masses, but the findings of a hypoechoic lesion with heterogeneous internal echoes and irregular borders are not specific.<sup>2,3,4,6</sup> The most reliable and definitive diagnostic studies include aspirate culture, PCR for mycobacterium, and histological examination of the

tissue sample.<sup>2</sup> If in doubt, computed tomography scanning may be useful for the differentiation of primary and secondary lesions by detecting continuity with the thoracic wall or pleura, and associated lesions of the lungs.<sup>6</sup>

## CONCLUSION

Tuberculosis of the breast is a rare condition. Despite the use of modern imaging techniques and documented 'specific' findings, differentiation from other benign or malignant conditions can be difficult. Microbiological and histological examinations remain the gold standard for the diagnosis of this uncommon disease.

## REFERENCES

1. Alagaratnam TT, Ong GB. Tuberculosis of the breast. *Br J Surg* 1980;67:125-126.
2. Hale JA, Peters GN, Cheek JH: Tuberculosis of the breast: rare but still existent. Review of the literature and report of an additional case. *Am J Surg* 1985;150:620-624.
3. Mankanjuola D, Murshid K, Al Sulaimani S, Al Salleh M. Mammographic features of breast tuberculosis: the skin bulge and sinus tract sign. *Clin Radiol* 1996;51:354-358.
4. Oh KK, Kim JH, Kook SH. Imaging of tuberculous disease involving breast. *Eur Radiol* 1998;8:1475-1480.
5. Tabar L, Ket K, Nemeth A. Tuberculosis of the breast. *Radiology* 1976;118:587-589.
6. Schnarkowski P, Schmidt D, Kessler M, Reiser MF. Tuberculosis of the breast: US, mammographic and CT findings. *J Comput Assist Tomogr* 1994;18:970-971.