Case reports

Tuberculosis of the breast: experience of a UK breast clinic serving an ethnically diverse population

A Jah, R Mulla, FD Lawrence, M Pittam, D Ravichandran

Breast Unit, Luton & Dunstable Hospital, Luton, UK

Tuberculosis (TB) of the breast is an uncommon disease in the West but its incidence is likely to increase. Five cases of breast tuberculosis are presented. The diagnosis and management of this condition are discussed.

Key words: Tuberculosis – Breast

Sir Astley Cooper first described tuberculosis of the breast in 1829 as ‘scrufulous swelling of the bosom’. It is an uncommon condition even in countries where tuberculosis is endemic, consisting of only 3–4.5% of all breast lesions.¹ It is rare in Western countries and constitutes less than 0.1% of all breast lesions examined histologically,² but the incidence of tuberculosis in the West is rising due to immigration and the increase in the frequency of HIV/AIDS. As a result, more patients may be expected to present to breast clinics with this condition.

We report five women who presented over a period of 12 years (1989–2001) to a district general hospital serving an ethnically diverse population. None of these patients had a contact history of TB or a history of TB elsewhere in the body.

Case reports

Case 1

A 37-year-old black African woman had a 2-year history of multiple, recurrent lumps in the left breast. She has had at least two lumpectomies done in Kenya on separate occasions. On this presentation, she had wide-spread induration and erythema of the breast clinically suggestive

of an infective process. An incision and curettage of the infective tissue was done and the histology showed tuberculoid granulomata with multinucleate giant cells. Zeil-Neelson (ZN) stain and culture were negative for *Mycobacterium tuberculosis* but she had a positive tuberculin skin (Heaf) test. She had a full course of anti-tuberculosis therapy (ATT) and 8 years later remains well except for cyclical mastalgia.

Case 2

A 57-year-old Pakistani woman was found to have a well-defined retro-areolar mass on mammograms on routine breast screening. Examination of the breast was normal but there was axillary lymphadenopathy. Ultrasonography also confirmed the presence of a mass and ultrasound-guided fine needle aspiration cytology (FNAC) of the lesion revealed epithelioid granulomata. ZN stain was negative but the Heaf test was strongly positive (grade IV). She had a course of ATT and remains well 6 years later.

Case 3

A 32-year-old Caucasian woman presented with a 3-week history of a painless 2 cm lump in the upper outer quadrant

Correspondence to: D Ravichandran, Consultant Surgeon, Luton & Dunstable Hospital, Luton LU4 0DZ, UK
Tel/Fax: +44 (0) 1582 718009; E-mail: ravi_surgery@hotmail.com

Figure 1 Photomicrograph showing caseating necrosis at the edge of granulomatous inflammation (case 4). H&E stain. Original magnification x40.

of the left breast, which was clinically benign. Radiologically, the appearances were indeterminate but FNAC showed cells suspicious of malignancy. An excision biopsy revealed multiple non-caseating granulomata on histology. No acid-fast bacilli (AFB) were identified histologically but she had a positive Heaf test. Five years after completing a course of ATT, she remains well.

Case 4

A 63-year-old Kashmiri woman presented with non-specific pain in the left breast. Clinical examination and mammograms were unremarkable. Six months later, she represented with a 3-cm, ill-defined inflammatory lump in the lower outer quadrant of the same breast. Ultrasonography showed non-specific increase in tissue density in the area and the mammogram was not repeated. FNA was insufficient for diagnosis and core biopsy revealed oedematous stroma with a lymphocytic infiltrate. Despite a 2-week course of antibiotics, the indurated area progressed to form a localised abscess, which was surgically drained. However, the wound failed to heal completely leading to

the formation of a chronic discharging sinus after 3 months. On surgical exploration, the sinus was found to extend to the sixth rib and was completely excised. Histology showed tubercular caseating granulomas (Fig. 1). CT of the chest confirmed the 6th rib as the primary site and the lung fields were clear. The wound healed up within 3 weeks of the commencement of ATT and she continues to be well 9 months after the completion of the course.

Case 5

A 21-year-old university student of Indian origin presented with a history of repeated episodes of mastitis within the previous 12 months, which had failed to respond to several courses of antibiotic treatment. She was a heavy smoker. Examination revealed clinically non-discrete tender areas in the left breast. An ultrasound scan suggested duct ectasia. Two months later, another ultrasound scan showed multiple hypo-echoic areas in the breast. Material aspirated from these areas revealed epithelioid granulomata and Langhans-type giant cells on microscopy, suggestive of TB (Fig. 2). No AFB were

Figure 2 Photomicrograph of FNA from case 5 showing epithelioid granuloma. Rehydrated H&E stain. Original magnification x200.

identified on ZN staining but this material grew *M. tuberculosis* on culture. She continues to be well 7 months after receiving a full course of ATT.

Discussion

The rarity of breast involvement in TB may be due to the relative lack of lymphoid tissue within the breast. In a survey of British-Asian women, breast TB comprised 2.3% of all notified cases of tuberculosis.³

Tuberculosis of the breast is classified as 'primary' if there is no other organ involved and 'secondary' when a source outside breast can be identified. An extramammary source is identified in less than 15% of cases⁴ and only in one patient in this study. The mode of spread to the breast may be haematogenous, lymphatic, direct extension from the chest wall (pleura or ribs) or the axillary lymph nodes and by inoculation of broken skin or duct openings by infected sputum.

Four of our patients belonged to ethnic minority groups who have a higher incidence of TB than the native white population. A lump (which can mimic carcinoma) is

the commonest clinical presentation, followed by inflammation and abscess, ulceration, sinus, and diffuse mastitis. Tuberculous mastitis is most common in women of child-bearing age (20–40 years) and the infection is usually unilateral. Pregnant and lactating women appear to be at higher risk, which may be due to the increased blood supply to the breast and transmission through baby's saliva.⁴ Inflammation of the breast that does not respond to standard antibiotic therapy in a young woman from an area where TB is endemic should raise suspicion.⁵ Constitutional symptoms like fever, malaise, night sweats and weight loss are found in less than 20% of cases.⁴ None of our patients had these systemic manifestations.

Mammograms and ultrasonography usually reveal only non-specific changes. Coarsening of stromal texture may be seen in the early stages while in advanced stages the appearances are indistinguishable from other causes of breast lump or inflammation, although demonstration of a sinus tract may suggest TB.^{4,6} FNAC may be useful and may show epithelioid cells, giant cells or necrosis in varying combinations.⁷ Reports from endemic areas suggest that FNAC is highly reliable in making the

diagnosis;^{7,8} however, in our experience, FNAC suggested the diagnosis in two cases only. This might be due to the experience of cytopathologists working in endemic areas and a lower threshold for the diagnosis of TB in such areas. Whereas the presence of a chronic lymphocytic infiltrate on FNAC or core biopsy may be considered sufficient to justify commencement of ATT in high prevalence areas, stronger evidence would usually be required for the diagnosis in the West, where the disease is still rare.

Presence of caseating epithelioid granulomas with giant cells on histology is highly suggestive of TB although acid-fast bacilli are identifiable in less than 25% of cases.⁷ For bacilli to be identified microscopically, they have to be present in sufficient numbers and failure to demonstrate AFB does not exclude the diagnosis.⁷ AFB positivity of FNA is reported to be higher in the presence of tissue necrosis as illustrated in case 5 above. Granulomatous mastitis forms an important histological differential diagnosis and other differential diagnoses include plasma cell mastitis and actinomycosis.^{4,7} A strongly positive reaction to skin testing with tuberculin antigen supports the diagnosis when clinical suspicion exists.¹ However, the skin test can be negative in 10–25% of cases with active tuberculosis⁹ especially in those with depressed immunity, while false-positive responses occur due to BCG immunisation.

Diagnosis of breast tuberculosis is, therefore, made on clinical suspicion, presence of granulomatous inflammation, demonstration of *M. tuberculosis* on microscopy and/or culture, strongly positive tuberculin skin test and failure of conventional management. All these features are unlikely to be present in all patients. Application of polymerase chain reaction may improve the diagnosis by isolation of bacterial DNA.¹⁰

Treatment is by combination chemotherapy using three or four drug regimens. Surgery is generally limited to diagnostic biopsy, aspiration of cold abscess and excision of residual sinuses. Excision of focal disease such as a lump, ulcer or sinus may result in a rapid clinical response. Rarely, simple mastectomy with or without axillary clearance may be required for resistant cases or in those with destruction of breast and/or extensive nodal involvement.^{3,6}

Conclusions

Diagnosis of tuberculosis of breast can be difficult and requires a high index of suspicion. An attempt should be made to obtain microbiological proof. However, histological suggestion to the diagnosis along with indirect evidence in the form of a strongly positive skin test may be the only available evidence. Indeed, a good therapeutic response to antitubercular chemotherapy may be the only way to confirm the diagnosis in some cases.

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