left, associated with ipsilateral chest wall tenderness. Pulse rate was 110 per minute and blood pressure 88/58 mmHg. Haemoglobin was 12.1 g/dL, coagulation normal; white cell count $16.1 \times 10^9/L$; platelet count $382 \times 10^9/L$.

Needle thoracocentesis in the second intercostal space yielded 800 mL of air. A chest X-ray subsequently showed a large left-sided haemothorax without residual pneumothorax. She remained breathless and a size 26 chest drain was inserted with immediate drainage of 1200 mL blood. Over the next 2 hours the chest drain produced a further 1200 mL. Despite 2 units of blood, 1 L colloid and 2 L crystalloid via a central line she remained hypotensive and the thoracic surgeons recommended urgent thoracotomy. At operation the source of bleeding was located at the apex of the lung. A vascular adhesion had become disrupted by the development of the pneumothorax that followed the FNA. Postoperatively she spent 4 days in intensive care, requiring a total of 14 units of blood and 8 units of fresh frozen plasma.

COMMENT

FNA is the fastest and easiest method of breast biopsy, and the results are rapidly available. Pneumothorax is a recognized complication, with an incidence ranging from 0.01% to 3%.² Risk factors are deep breast lumps, thin body build and breath-holding during the procedure. The complication has been associated with FNA in any of the four quadrants of the breast but especially with aspiration in the outer upper quadrant. In 50–80% of cases no specific treatment is needed; the remainder require insertion of a chest drain.^{3,4} Haemopneumothorax following FNA of a breast lump has not to our knowledge been previously reported. In the present case the bleeding was life-threatening and required open thoracotomy, although thoracoscopy⁵ might have been an alternative.

The risk of pneumothorax can be lessened by technique: the patient should breathe normally⁴ and the needle should be inserted into the mass parallel rather than perpendicular to the chest wall whenever possible^{2,3} especially in thin patients² with small breasts. In addition, blind aspiration is giving way to image-guided methods, the simplest of which is ultrasound.⁶ If the lesion is visible ultrasonically, the needle can be followed in real time to its destination. Other methods of image guidance are CT,^{6,7} stereotactic mammography⁸ and MR.⁹ MR-guided biopsy is not yet widespread but is likely to be used increasingly by hospitals and diagnostic centres.

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Periprosthetic tuberculous breast infection

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If persistent exudates occur in association with breast implants it is important to think of mycobacteria.

CASE HISTORY

A woman of 31 was referred to the chest clinic in January 2001 with weight loss and sweats. She had not lived or travelled abroad and had been well in the past apart from mild migraine and asthma. In 1997 she had had bilateral silicone breast augmentation prostheses inserted. Chest X-ray showed left apical shadowing. Physical examination and blood tests were normal. She was unable to produce sputum for culture and would not agree to bronchoscopic lavage for suspected tuberculosis. CT-guided lung biopsy showed some caseating necrosis with occasional multinucleated giant cells. Although stains and culture for mycobacteria were negative, tuberculosis was thought the

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most likely diagnosis and she was started on triple therapy with rifampicin, isoniazid and pyrazinamide (given as Rifater four tablets each morning).

She felt ill on her treatment and without consultation reduced the dose. She was restarted on the correct dose and two months later was switched to treatment with rifampicin and isoniazid (Rifinah 450 mg each morning). Three months later she developed a left pleural effusion and 500 mL pleural fluid was aspirated. Stains for acid-fast bacilli were negative, but the following month a specimen grew *Mycobacterium tuberculosis* fully sensitive to all commonly used drugs. That month (i.e. six months after starting chemotherapy) she also complained of swelling and tenderness in the left breast. She then admitted that she had never believed the original diagnosis of tuberculosis and had not complied well with treatment. Having realized the importance of proper compliance she was restarted on chemotherapy with Rifater in September 2001, and two months later switched to Rifinah. This treatment was not 'directly observed' but was closely supervised.

In December 2001 ultrasound examination of the right breast was satisfactory and that of the left breast showed an intact capsule with some pericapsular fluid. The following month the left breast prosthesis began to discharge pus. She required subsequent removal of this prosthesis with capsulectomy. Histology of the breast capsule showed inflammatory changes with some foreign-body giant cells. The breast swab and prosthesis culture both grew *M. tuberculosis*, fully sensitive to standard drugs. Two months later because of persistent discharge from her other breast scar the right breast prosthesis was removed, but culture for tuberculosis was not requested. Both breast incision scars continued to discharge. In May 2002 she completed seven months of her final course of antituberculosis treatment. The breast discharges gradually subsided and by October 2002 the breasts had fully healed. A chest radiograph showed complete clearing. She has remained free of evidence of tuberculosis, and has expressed the desire to have breast augmentation prostheses reinserted.

COMMENT

Infection following breast implantation is uncommon, with an incidence seldom exceeding 3%.¹ In this instance the infection probably originated from the lung tuberculosis, which was not cured within the usual six months² because of poor adherence to the treatment. Infected prostheses usually have to be removed, but in non-tuberculous infections salvage by systemic antibiotics is sometimes possible.¹

Mammary tuberculosis is uncommon in the west but accounts for up to 3% of breast disease in India.³ The

condition can present with nodular masses mimicking carcinoma, with tender nodularity, or with sinus formation. Implantation of a foreign body can produce a 'sanctuary site' for development of tuberculosis, and such infection of hip prostheses is well described.⁴ Surprisingly, we have found no previous report of breast implant infection with *M. tuberculosis*, though infection with environmental (opportunistic) mycobacteria is well recognized.⁵⁻⁸ These are organisms widely found in nature, often of low pathogenicity. In a survey in the USA of infections following augmentation mammoplasty most of these environmental mycobacterial infections (which were rare) were due to *M. fortuitum*.⁵ These infections were probably acquired intraoperatively.^{1,6} Insertion of such large foreign bodies demands exceptional sterility, together with avoidance of haematoma and tissue ischaemia. There are other reports of *M. fortuitum* and *M. chelonae* affecting breast implants,⁶ as well as descriptions of infection with *M. avium-intracellulare*, both in immunocompetent patients⁷ and in those with the acquired immunodeficiency syndrome.⁸ A breast prosthesis infected with *M. tuberculosis* should probably be removed. Standard chemotherapy for at least six months is vital to eradicate the infection,³ and longer courses may be necessary for environmental mycobacteria.⁹

When pus from a breast abscess is reported as sterile, or where a breast implant or abscess continues to discharge, the laboratory should be asked to stain and culture the fluid for acid-fast bacilli.

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