Breast abscess

DEFINITION

Localised infection with pus collection in breast tissue. The two main forms are puerperal (lactational) and non-puerperal.

AETIOLOGY

Lactational: Milk stasis associated with infection, most commonly with *Staphylococcus aureus*, coagulase-negative staphylococci.

Non-puerperal: *S. aureus* and anaerobes, often enterococci or *Bacteroides* spp. (TB and actinomycosis are rare causes). Smoking, mammary duct ectasia/periductal mastitis, associated inflammatory breast cancer should be excluded. Also associated with wound infections after breast surgery, diabetes and steroid therapy.

EPIDEMIOLOGY

Lactational breast abscesses are common and tend to occur soon after starting breast-feeding and on weaning, when incomplete emptying of the breast results in stasis and engorgement. Non-lactational abscesses are more common in those aged 30–60 years and in smokers.

HISTORY

The patient complains of discomfort and development of a painful swelling in an area of the breast. She may complain of feeling unwell and feverish.

Women with a non-puerperal abscess often have a history of previous infections, systemic upset is often less pronounced.

EXAMINATION

Local: The area of the breast is swollen, warm and tender. The overlying skin may be inflamed; examination of the nipple may reveal cracks or fissures. In non-puerperal cases, there may be evidence of scars or tissue distortion from previous episodes, or signs of duct ectasia, e.g. nipple retraction.

Systemic: Pyrexia, tachycardia.

INVESTIGATIONS

Imaging: Ultrasound + aspiration for microscopy, culture and sensitivity of pus samples.

MANAGEMENT

Medical: Early, cellulitic phase may be treated with antibiotics (flucloxacillin in the case of lactational, with the addition of metronidazole in non-puerperal abscesses). Regular breast drainage to prevent milk stasis.

Surgical: *Lactational*: Daily needle aspiration with antibiotic cover may be successful. Formal incision and drainage is reserved for larger abscesses (>5 cm). The incision should allow full drainage and be cosmetically acceptable; loculi are explored and broken down. The wound may be packed lightly and left open, with daily packing, or primary closure performed. Breastfeeding should continue from the non-affected breast and the affected side emptied either manually or with a breast pump. Advice on avoiding cracked nipples.

Non-puerperal: Open drainage should be avoided, or carried out through a small incision. Definitive treatment should be carried out once the infection has settled by the excision of the involved duct system.

COMPLICATIONS

Slow wound healing, difficulties in breastfeeding, poor cosmetic outcome and mammary fistula formation; rarely, overlying skin undergoes necrosis.

PROGNOSIS

If untreated, a breast abscess will eventually point and spontaneously discharge onto the skin surface. Non-puerperal abscesses tend to recur.

Breast cancer

DEFINITION

Malignancy arising from breast tissue.

AETIOLOGY

Combination of genetic and environmental factors.

Genetics: Most cases are polygenic risk with 5–10% attributable to inherited factors. BRCA-1 (17q) and BRCA-2 (13q) gene mutations are implicated in ~2% of cases (carriers have lifetime risk up to 87%). Rare genetic breast cancer syndromes include Li–Fraumeni syndrome (TP53), Cowden's syndrome (PTEN), Peutz–Jeghers syndrome (STK11/LKB1), ataxia-telagiectasia (ATM) and Muir–Torre syndrome (MSH2/MLH1).

ASSOCIATIONS/RISK FACTORS

Age, prolonged exposure to female sex hormones (particularly oestrogen), nulliparity, early menarche, late menopause, menopausal hormone replacement therapy, obesity, alcohol.

EPIDEMIOLOGY

Worldwide, the leading cause of cancer death in women (second only to lung cancer in the USA). The lifetime risk is 1 : 9 in the UK. Peak incidence in 40- to 70-year-olds. Rare in men (<1% of all breast cancers).

HISTORY

May be detected from screening.

Symptoms of primary: Breast lump (usually painless), changes in breast shape, nipple discharge.

Symptoms of secondary spread: Axillary lump, bone pain, weight loss, paraneoplastic syndromes (e.g. cerebellar syndrome).

EXAMINATION

Inspection of breasts with the patient upright and supine, assessing for asymmetry, peau d'orange appearance of skin (oedema), dimpling or tethering, nipple scaling or inversion or, in advanced cases, ulceration.

Palpation using clockwise radial technique (for hard, irregular, fixed lumps).

Examination for palpable axillary, supraclavicular lymph nodes, chest abnormalities, hepatomegaly, bony tenderness.

INVESTIGATIONS

Triple assessment: Standardised approach to investigating a breast lump, consisting of clinical examination, imaging (mammography, ultrasound, MRI) and tissue diagnosis (cytology or biopsy).

Mammogram (Fig. 1): Useful screening investigation in women >35 years. In the UK, screening begins after the age of 50. Standard views are craniocaudal and mediolateral oblique. Features of malignancy include branching or linear microcalcifications and spiculated lesions.

Ultrasound: To identify benign cystic lesions from sinister solid lesions. More useful in women <35 years.

Fine-needle aspiration: Minimally invasive, allows cytology of discrete breast lumps and drainage of cysts.

Core biopsy: Can be image guided, enables histological diagnosis.

Sentinal lymph node biopsy: Radioactive tracer and/or blue dye is injected near the breast lesion, and a nuclear scan identifies the sentinel node and the node is biopsied to detect spread.

Staging: CT (chest, abdomen, pelvis), PET or bone scanning for metastases.

Blood: FBC, U&Es, Ca^{2+}, bone profile, LFT, tumour marker (CA-15-3).

Breast cancer (continued)

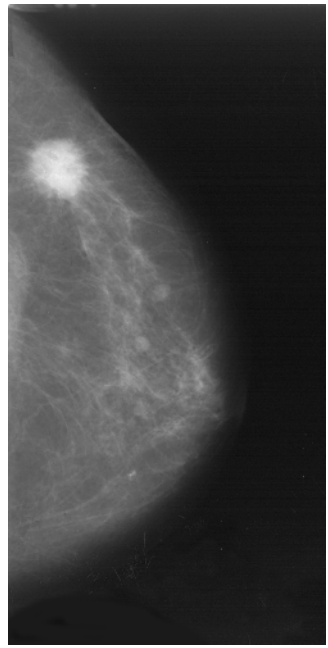

Figure 1 Mammogram showing a spiculated breast cancer lesion.

Histology:

- *In situ carcinoma*: Non-invasive with basement membrane intact – ductal or lobular carcinoma in situ (DCIS, LCIS).
- *Invasive*: Most common is ductal carcinoma (75% of breast cancers).
- *Others*: Lobular (10–15%, 'Indian filing' arrangement of cells), tubular, mucinous, medullary, cribriform, papillary and Paget's disease of the nipple (ductal carcinoma *in situ* infiltrating the nipple).
- *Phlloides*: Fibroepithelial tumours that can be benign or malignant.
- *Molecular prognostic factors*: Oestrogen and progesterone receptors (ER, PR) and HER-2 expression (20–30% of cancers) are valuable prognostic indicators and guide treatment. Flow cytometry measures DNA content (ploidy) and S-phase fraction (cell proliferation rate).

Grading: The Nottingham modification of the Bloom and Richardson grading system is a prognostic indicator. Three features assessed are tubule formation, nuclear size/pleomorphism and number of mitoses. Scores are used to generate Grades 1 (well differentiated) to 3 (poorly differentiated).

Staging: The UICC TNM-staging system.

Tumour size (T): T1: <2 cm; T2: 2–5 cm; T3: >5 cm; T4: any size with chest wall or skin extension.

Nodes (N): N1: mobile ipsilateral axillary; N2: fixed ipsilateral axillary; N3: ipsilateral internal mammary nodes.

Metastases (M): M0: no distant metastases; M1: distant metastases.

Breast cancer (continued)

MANAGEMENT

Multidisciplinary management: Includes breast surgeon, radiologist, oncologist and breast care nurses. Surgery to remove the cancer depends on the size, location, type, stage and consideration of the individual patient's wishes.

Breast-conserving surgery: Wide local excision/segmental mastectomy (single cancer, <5 cm, can be excised as a whole and patient is willing to undergo radiotherapy). Smaller lesions may need radiological wire localisation.

Modified radical mastectomy: Total mastectomy, axillary lymph node dissection.

Axillary surgery: Is necessary for node staging and ranges from sentinel node biopsy (on average three nodes removed) to level III clearance (lymph nodes up to and above pectoralis minor muscle).

Breast reconstruction: Often as a delayed procedure, occasionally concurrently with surgical excision. Breast prostheses, latissimus dorsi or transverse rectus abdominis myocutaneous flaps are methods used.

Radiotherapy: External beam radiotherapy following breast-conserving surgery, occasionally as neoadjuvent therapy and in palliation of advanced tumours.

Chemotherapy: Treatment can be in neoadjuvent, adjuvant and palliative settings. More often in premenopausal women, rapidly progressive disease, visceral involvement, oestrogen receptor-negative tumours or where hormonal treatment has failed. Combination regimens, e.g. cyclophosphamide, methotrexate and 5-fluorouracil (CMF), are tailored to the individual patient.

Hormonal therapy: Includes selective oestrogen receptor modulators, e.g. tamoxifen, the main first-line therapy for oestrogen receptor-positive tumours. Others include aromatase inhibitors in postmenopausal women, e.g. anastrozole or letrozole; ovarian ablation with LHRH-analogues, e.g. goserelin; and selective oestrogen receptor downregulators, e.g. fulvestrant and progestins.

Biological therapy: Trastuzumab (Herceptin) is a monoclonal antibody against HER-2 receptor (cell growth promoter) used in combination with chemotherapy in node and HER-2-positive cancer, and is shown to improve disease-free and overall survival.

COMPLICATIONS

Significant psychological morbidity from diagnosis or physical deformity from surgery. Metastases can cause bone pain, hypercalcaemia, cord compression and cerebral, abdominal or pulmonary complications.

From tamoxifen: Endometrial cancer, venous thrombosis. Aromatase inhibitors: joint/muscle ache, osteoporosis. Herceptin: cardiotoxicity.

From surgery: Wound infection, haematoma, lymphoedema, shoulder pain, sensory loss (the intercostobrachial nerve is commonly sacrificed, resulting in an area of numbness on the inner, upper arm), local recurrence.

From radiotherapy: Fatigue, skin changes, lymphoedema.

PROGNOSIS

Depends on type, grade and stage. Overall 5-year survival 100% if localised to breast, 50–90% for node-positive disease and 20% with distant metastases.

Breast disease, benign

DEFINITION

Non-malignant conditions of the breast, including physiopathological lesions of epithelial, stromal, fat or vascular components of the breast.

Fibroadenoma: Result from hyperplasia of a breast lobule and contain both normal epithelial and connective tissue elements.

Fat necrosis: Irregular and necrotic adipocytes, amorphous material and inflammatory cells, including foreign body giant cells, can mimic malignancy.

Sclerosing adenosis: Is an aberration of normal involution.

Duct ectasia: Occurs when central ducts become dilated with duct secretions; if leakage occurs into periductal tissue, this causes an inflammatory reaction (periductal mastitis).

AETIOLOGY

Breast tissue undergoes a wide range of changes under endocrine control. Fat necrosis occurs secondary to trauma. The ANDI (aberrations of normal development and involution) classification maps benign conditions according to both the pathogenesis and the degree of abnormality. Please see **Associations/Risk Factors**.

ASSOCIATIONS/RISK FACTORS

May be less common in those on contraceptive pill. Smoking is a risk factor for periductal mastitis.

EPIDEMIOLOGY

Commonly estimated only 10–20% of cases come to histological diagnosis. Diffuse fibrocystic changes are very common, seen in as many as 60% of women, and 70% experience mastalgia. Fibroadenomas are more common in the 15–25 age group, breast cysts in 40- to 50-year-olds, and usually disappear after menopause unless on hormone replacement therapy (HRT).

HISTORY

History of breast discomfort or pain (cyclical or non-cyclical mastalgia), swelling or lump. Nipple discharge (if bloodstained, malignancy should be suspected). Risk factors for breast cancer should be ascertained, including family history, menstrual history, pregnancies, use of OCP or hormone replacement therapy.

EXAMINATION

Focal or diffuse nodularity of breasts.

Fibroadenomas are usually smooth, well-circumscribed and mobile lumps (1–2 cm in diameter, 'breast mouse').

Yellow/green nipple discharge (duct ectasia).

Features of malignancy are absent, e.g. dimpling, peau d'orange skin changes, enlarged axillary lymph nodes.

INVESTIGATIONS

Usually performed in the context of triple assessment:

1. Clinical examination.
2. Imaging: Mammography (craniocaudal and oblique mediolateral views ± spot compression and magnification views) or USS in younger patients (<35 years). Benign masses are less likely to be calcified (microcalcifications are highly suggestive of malignancy). MRI scanning can also be useful.
3. Cytology/histology: By FNA (fine-needle aspiration) cytology or trucut or excision biopsy.

MANAGEMENT

Conservative: Symptomatic treatment, e.g. analgesia, evening primrose oil (a rich source of gammalinoleic acid) for mastalgia. Advice on wearing supportive bra and diet (reduced dietary fat). Danazol is used as second-line treatment. (17-α-ethinyl testosterone suppresses gonadotropin secretion, prevents LH surge and inhibits ovarian steroid formation). Fibroadenomas may be treated conservatively or removed if large or on request.

Breast disease, benign (continued)

Simple cysts do not need aspiration unless clinically indicated and, on aspiration, should disappear completely. If not, it should be treated as a breast lump.

Surgery: Includes removal or excision biopsy of breast lump; a wide local excision should be performed if there is any suspicion that it is not benign. Microdochectomy is performed for intraductal papillomas. Hadfield's (or Adair's) operation excises central ducts in duct ectasia.

COMPLICATIONS

Pain, recurrence.

PROGNOSIS

Good, although recurrence is common. Fibroadenomas: no increased risk of cancer in woman with simple FA and no increased family history of breast cancer.