

## In Shortly about Breast Diseases

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### Abstract

In most women, breast pain is not severe and disappears very quickly on its own. Severe pain, which is rare, can be relieved with medication. Benign breast diseases are common in young and older women, and malignant breast diseases most commonly occur around and after menopause. Although much rarer than benign changes, breast cancers are the most common cancers in women and represent a significant health problem. When she feels pain in her breast, the woman immediately thinks she has got breast cancer. Pain is not always a symptom of cancer. This paper discusses breast cancer, as the most common type of cancer in women, but also some other breast diseases that are not so common.

**Key Words:** Breast, Cancer, Surgery, Ultrasound

### Introduction

Whatever the presenting symptoms, the patient fears she may have cancer [1]. A rapid, efficient and sympathetic approach, paying attention to psychological and emotional problems, is required in dealing with breast disease. The treatment of breast cancer is multidisciplinary involving surgeons, oncologists, breast care nurses, breast clinicians, specialist radiologists and pathologists. Triple assessment is the minimum standard of care for a mass or asymmetric density/thickening of the breast. Triple assessment includes examination, imaging and pathology. Imaging includes mammography + ultrasound. Pathology includes FNAC (fine needle aspiration cytology), core biopsy, vacuum assisted mammotome biopsy. As a core or mammotome biopsy offers the pathologist a sample of histological tissue with its surrounding architecture, it is more accurate for diagnosis than cells in suspension as in FNAC, and is therefore preferable. Cases are discussed with the pathological and radiological findings at a multidisciplinary team meeting. The radiological size of a tumour and lymph node status, its histological type (e.g. ductal, lobular, mucinous) and hormonal receptor status (oestrogen receptor, progesterone receptor and HER2 protein receptor positivity) are reviewed with patients clinical and social history and a plan for both surgery and adjuvant therapy is made.

### Physiology

More than a quarter of general surgical outpatient referrals are females with breast symptoms, only a small proportion of whom will have breast cancer [2]. Less than ten per cent of general surgical operations are for breast disease. Breast cancer has by far the best prognosis of the common solid organ malignancies and, with constantly improving treatments, up to 80 per cent of sufferers are alive and well 10 years after diagnosis. Nevertheless, public perception and constant media attention ensure that women with breast symptoms are significantly more anxious than other surgical patients. Breast development is occasionally seen in neonates as a consequence of maternal oestrogens crossing the placenta. Babies of both sexes may be affected and lactation can occur ('witches' milk'), sometimes complicated by abscess formation.

Normally the female breast develops shortly before the menarche.



Occasionally, the enlargement is asymmetrical and causes great parental anxiety.

The breasts increase in size in the second half of each menstrual cycle, following ovulation. Mild pain and tenderness during this phase are common.

In pregnancy, the size and texture of the breasts change profoundly in preparation for lactation. At this time and during lactation, clinical assessment is much more difficult.

## Symptoms

Breast symptoms are common but only one in ten patients referred to surgical clinics has a carcinoma [3]. The remainder have a variety of conditions labelled benign breast disease. Many conditions are not truly pathological but aberrations of normal development that occur between puberty and old age.

Patients with breast symptoms are best assessed in a one-stop breast clinic where so-called triple assessment, i.e. clinical examination, fineneedle aspiration cytology and imaging (ultrasound or mammography), allows rapid diagnosis of most breast conditions.

This occurs between 20 and 45 years and settles after the menopause [1]. It probably results from an abnormal response of the breast to changes in the hormonal environment. The terms fibroadenosis and cystic hyperplasia describe the pathological condition well. There is exaggeration of the fibrotic element (i.e. fibrosis), the epithelial element undergoes hyperplasia (i.e. adenosis), and there is a tendency to cyst formation. The condition may be extremely painful, especially premenstrually, hence the terms cyclical mastitis or cyclical mastalgia. Cyclical breast pain worse before period. Intermittent breast masses or areas of thickening with no discrete mass. Discrete mass, i.e. cysts, may be noticed by patient. Examination reveals nodular breasts with multiple thickened areas (usually upper and outer quadrant) that are usually tender. Lesions change in number and size during the menstrual cycle. If condition is suspected, examination should be repeated at different stages of the menstrual cycle. If there is a dominant mass, 'triple' assessment should be carried out.

There are five common symptoms of breast disease that warrant urgent attention [4]:

- a new, discrete lump;
- nipple discharge – blood-stained or persistent;
- nipple retraction or distortion of recent onset;
- altered breast contour or dimpling;
- suspected Paget's disease.

Other common symptoms that require further investigation include persistent asymmetrical nodularity, pain (mastalgia), and a family history of breast cancer.

## Ultrasound

Handheld ultrasound (US) has improved enormously over the last 20 years with markedly improved resolution and rapid image processing [5]. While it is rarely used as a primary diagnostic tool, US is used in the majority of patients presenting with a clinical

symptom as an adjunctive tool to further analyze a mammographic abnormality to determine whether a soft tissue mass is solid or cystic and to differentiate benign from malignant masses. It is also used when there is a negative mammographic examination, but the patient has a clinical symptom or palpable abnormality. The procedure is acceptable to patients, is safe with no ionizing radiation, but is operator dependent. The drawback for conventional US is that in breast tissue with extensive fibrocystic disease and shadowing, small tumors can be overlooked especially if they are invasive lobular disease. Ductal carcinoma in situ (DCIS) can be picked up now due to the improved resolution as microcalcification can produce a speckled pattern but DCIS with no calcification is difficult to detect.

Whole-breast US or Automated Breast US (ABUS) is a technique that is rapidly gaining acceptance. This technique requires the operator to undertake three positions with a flat panel US plate of each breast. The images are reconstructed to produce a 3D examination of the breast. This technique is showing promise in many clinical trials and may become the examination of choice for women with dense breasts in whom a supplemental examination is justified. A third of the United States, France, and Belgium have introduced supplemental imaging techniques such as US for women with BIRADS C & D breast density although in all cases this additional examination is insurance or self-funded. The literature supports the use of the supplemental imaging with studies reporting an additional 4 cancers/1000 screens when used with annual or 2-yearly screening. While the drawback for screening US has traditionally been that it had high recall rates ranging from 10 to 30%, a recent publication from Sweden has shown more promising results with ABUS with recall below 2.5% while good sensitivity is retained.

## Fibrocystic Condition

Fibrocystic condition is the most frequent lesion of the breast [6]. Although commonly referred to as "fibrocystic disease," it does not, in fact, represent a pathologic or anatomic disorder. It is common in women 30-50 years of age but rare in postmenopausal women who are not taking hormonal replacement. Estrogen is considered a causative factor. There may be an increased risk in women who drink alcohol, especially women between 18 and 22 years of age. Fibrocystic condition encompasses a wide variety of benign histologic changes in the breast epithelium, some of which are found so commonly in normal breasts that they are probably variants of normal but have nonetheless been termed a "condition" or "disease."

The microscopic findings of fibrocystic condition include cysts (gross and microscopic), papillomatosis, adenosis, fibrosis, and ductal epithelial hyperplasia. Although fibrocystic condition has generally been considered to increase the risk of subsequent breast cancer, only the variants with a component of epithelial proliferation (especially with atypia) or increased breast density on mammogram represent true risk factors.

Fibrocystic condition may produce an asymptomatic mass in the breast that is discovered by accident, but pain or tenderness often calls attention to it. Discomfort often occurs or worsens during the premenstrual phase of the cycle, at which time the cysts tend to enlarge. Fluctuations in size and rapid appearance or



disappearance of a breast mass are common with this condition as are multiple or bilateral masses and serous nipple discharge. Patients will give a history of a transient lump in the breast or cyclic breast pain.

## Cancer

If we consider hereditary breast cancer development, current data coming from basic research confirm that the genetic predisposition is 5-10% [7]. Women with BRCA1 or BRCA2 mutation have a cumulative risk of invasive cancer ranging from 55 to 85% and of invasive epithelial ovarian cancer ranging from 15 to 65%. The risk of developing breast cancer increases near the age of 25 years. The identification of breast cancer susceptibility genes BRCA1 or BRCA2 was performed in 1994 and 1995 respectively according to the evidence of premature truncation of the BRCA1 or BRCA2 protein. Modern prophylactic surgery for women at high risk of breast cancer, according to the molecular tests, include total bilateral mastectomy (TBM) without axillary lymph node dissection, skin-sparing total mastectomy, and subcutaneous nipple-sparing mastectomy, reconstruction with artificial breast implants or tissue reconstruction options using transverse rectus abdominis flap and the latissimus dorsi flap. A final procedure being discussed is areolar-sparing mastectomy. The efficacy of prophylactic TBM in reducing the incidence of breast cancer at three years of follow-up has been demonstrated. Prophylactic TBM reduced the risk of breast cancer by 95% in women who also had a risk-reducing salpingo-oophorectomy and by 90% in women that had intact ovaries. Prophylactic surgery is a highly personal decision and the protective effects of surgery must be weighed according to possible complications and psychological problems.

Cancer of the breast is a pathologic entity that starts with a genetic alteration in a single cell and may take several years to become palpable [8]. The most common histologic type of breast cancer is infiltrating ductal carcinoma (80% of cases), whereby tumors arise from the duct system and invade the surrounding tissues. Infiltrating lobular carcinoma accounts for 10% to 15% of cases. These tumors arise from the lobular epithelium and typically occur as an area of ill-defined thickening in the breast. Infiltrating ductal and lobular carcinomas usually spread to bone, lung, liver, adrenals, pleura, skin, or brain. Several less common invasive cancers, such as medullary carcinoma (5% of cases), mucinous carcinoma (3% of cases), and tubular ductal carcinoma (2% of cases) have very favorable prognoses. Inflammatory carcinoma and Paget's disease are less common forms of breast cancer. Ductal carcinoma in situ is a noninvasive form of cancer (also called intraductal carcinoma), but if left untreated, there is an increased likelihood that it will progress to invasive cancer. There is no one specific cause of breast cancer; rather, a combination of genetic, hormonal, and possibly environmental events may contribute to its development. If lymph nodes are unaffected, the prognosis is better. The key to improved cure rates is early diagnosis, before metastasis.

## Risk Factors

- Gender (female) and increasing age.
- Previous breast cancer: The risk of developing cancer in the

same or opposite breast is significantly increased.

- Family history: Having first-degree relative with breast cancer (mother, sister, daughter) increases the risk twofold; having two first-degree relatives increases the risk fivefold.
- Genetic mutations (BRCA1 or BRCA2) account for majority of inherited breast cancers.
- Hormonal factors: early menarche (before 12 years of age), nulliparity, first birth after 30 years of age, late menopause (after 55 years of age), and hormone therapy (formerly referred to as hormone replacement therapy).
- Other factors may include exposure to ionizing radiation during adolescence and early adulthood obesity, alcohol intake (beer, wine, or liquor), high-fat diet.

## Anaesthesia

Nowadays more and more cases are being done under nerve blocks [9]. With the help of ultrasound, specific nerves can be blocked. These blocks are administered directly under local or after giving sedation or general anaesthesia. Nerve blocks provide good quality analgesia of longer duration and help to reduce the requirement of analgesics, especially opioids in the postoperative period.

Usually, general anaesthesia is preferred for aesthetic breast surgery. "Awake breast augmentation" has been reported and is being done in some parts of the world, though not preferable by most of the patients. Various regional techniques like thoracic epidural, paravertebral and intercostal nerve blocks have been used. However, they are more invasive and have their own complications. The pectoral nerve blocks (PEC) are less invasive and have fewer complications. They are, therefore, preferable in a daycare setting.

PEC -I is administered between the pectoralis major and minor muscles at the level of the third rib using 10 mL local anaesthetic. This easy and reliable technique is mainly used for superficial surgeries limited to pectoralis major. For more extensive operations requiring deep dissection, PEC 2 block is given i.e. another 10 mL local anaesthetic is injected in the plane between pectoralis minor and serratus anterior at the third rib level. This blocks the lateral branches of thoracic spinal nerves.

## Surgical Complications

The context and perspective of the individual who is viewing the complication, risk, or consequence of surgery is the key factor in determining the significance of a complication [10]. Perhaps surprisingly, the actual degree of incapacity, inconvenience, or severity of the complication itself is not, of itself, always the prime factor in making a complication significant for a patient. Grading of the significance of any complication or consequence of surgery or the relative risk of these is a potentially complex issue and is highly dependent on the person or perspective from which the judgment is made. The reason for the surgery is another key factor; for example, cancer patients are often most concerned about survival.

A very frequent complication may be viewed as expected and if minor may not be significant but should usually be mentioned to



the patient. An unsightly scar may be viewed as inconsequential by the surgeon or general practitioner but may be the most disappointing outcome of an operation for the patient or patient's partner. Conversely, the surgeon may regard the breast reconstruction as near technically perfect, but the patient may be disappointed with the outcome. A major intra-abdominal anastomotic leak and infection may be regarded as very serious, devastating, and technically imperfect by the surgeon but not recalled or considered a major event by the patient after recovery, due to sedation and ICU care. Some complications are important in the perioperative period but pale into insignificance when the patient is well again. Some long-term relatively minor complications are annoying or irritating for the patient, while these may be considered minor and inconsequential for the surgeon. Some of these "minor" irritating long-term complications, for example, neural injury resulting in parasthesia or anesthesia, may torment the patient and come to the attention of the lawyer and courts, sometimes involving the surgeon, hospital, and indemnity insurance companies in protracted, time-consuming, and costly litigation. This is especially the case with failure to inform the patient of that risk and when poor communication has occurred.

## Treatment

Treatment options for most women with DCIS (ductal carcinoma in situ) are wide local excision and radiotherapy (breast-conserving therapy) if well localized and small, or if extensive or multifocal, mastectomy [11]. To aid excision of an impalpable lesion, a wire is placed under mammographic or ultrasound guidance so that the tip lies adjacent to the area needing removal. Axillary staging with sentinel lymph node (SLN) biopsy is not performed for DCIS treated by breast-conserving therapy as the risk of axillary nodal spread is very small. If a mastectomy is being performed to treat DCIS, most surgeons would 'stage' the axilla with SLN biopsy. This is because there is a small risk of there being undiagnosed invasive breast cancer within a large area of DCIS, and also because SLN biopsy cannot be performed after mastectomy if an invasive breast cancer is found within the mastectomy specimen.

If a wide local excision is performed, the surgical margins need to be carefully assessed to ensure complete excision. Further excisions may be required to achieve this. In high-grade or extensive DCIS there is good evidence from large randomized trials that radiotherapy reduces the rate of local recurrence. Because 50 per cent of local recurrences after treatment for DCIS are invasive, initial optimal treatment is vital. Immediate reconstruction should be offered to any undergoing a mastectomy to treat DCIS.

## Reconstruction

New generations of bioengineered dermal substitutes are being developed in the use for the treatment of burns (deep partial and full thickness) [12]. Other applications such as soft tissue replacement or coverage of chronic wounds with dermal substitutes were established. Recently these materials were used as suspensory materials or interpositional grafts in breast surgery. Due to inherited predisposition genes, many young women at high risk of breast cancer are choosing bilateral prophylactic

mastectomy.

Mastectomy followed by immediate breast reconstruction is oncologically safe, and it improves patients' psychosocial health. Many of these women are unwilling to endure the donor site morbidity, prolonged recovery and muscle weakness following autologous reconstruction. The ideal candidate for reconstruction with prosthetic implants is a thin patient requiring a bilateral reconstruction or a thin patient with normal, nonptotic breast who requires unilateral reconstruction. Currently staged postmastectomy prosthetic breast reconstruction is performed by placing a tissue expander deep to the pectoralis major muscle in the majority of cases. The expander is replaced with a permanent silicone or saline implant after the desired expansion has been obtained. The subpectoral position provides muscular coverage to the superior 2/3 of the implant.

There are various options for coverage of the remainder implant, one which includes the elevation and use of the serratus anterior superior muscle and a part of the external oblique fascia. Another option is to leave the lower pole of the implant in the subcutaneous position.

## Conclusion

Women can very often feel breast pain or breast tenderness before the menstrual cycle, probably due to hormonal changes that lead to menstruation. In most cases, pain is not a sign of breast cancer. Pain can also be caused by cysts or some ingredients from food or drink. In most women, breast pain is usually not severe and disappears on its own after a while. Every pain needs to be investigated because that is the only way to preserve health.

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