College of Medicine TUCOM

Dept. of Surgery

Breast Surgery

Anatomy

Breast is a modified **sweat** gland derived from ectoderm. *Vertically*—it extends from the **second** to the **sixth** rib in the mid-clavicular line and lies over pectoralis major, serratus anterior and external oblique muscles. *Horizontally*—from the side of **sternum** to the **mid-axillary** line.

The **axillary tail** of the breast is palpable in some normal subjects & is sometimes mistaken for a mass of enlarged lymph node.

The **lobule** is the basic structural **unit** of the mammary gland. (**10 – 100**) lobules empty via ductules into (**15–20**) **lactiferous ducts**, these ducts are lined with contractile myoepithelial cells and are provided with a terminal ampulla.

The ligaments of Cooper are hollow conical projections of fibrous tissue filled with breast tissue; the apices of the cones are attached firmly to the superficial fascia and thereby to the skin.

The areola contains involuntary muscle & its epithelium contains numerous sweat glands and sebaceous glands, the latter of which enlarge during pregnancy and serve to lubricate the nipple during lactation (**Montgomery's tubercles**).

The nipple is covered by thick skin with corrugations. Near its apex lie the orifices of the lactiferous ducts. It contains smooth muscle fibres & nerves.

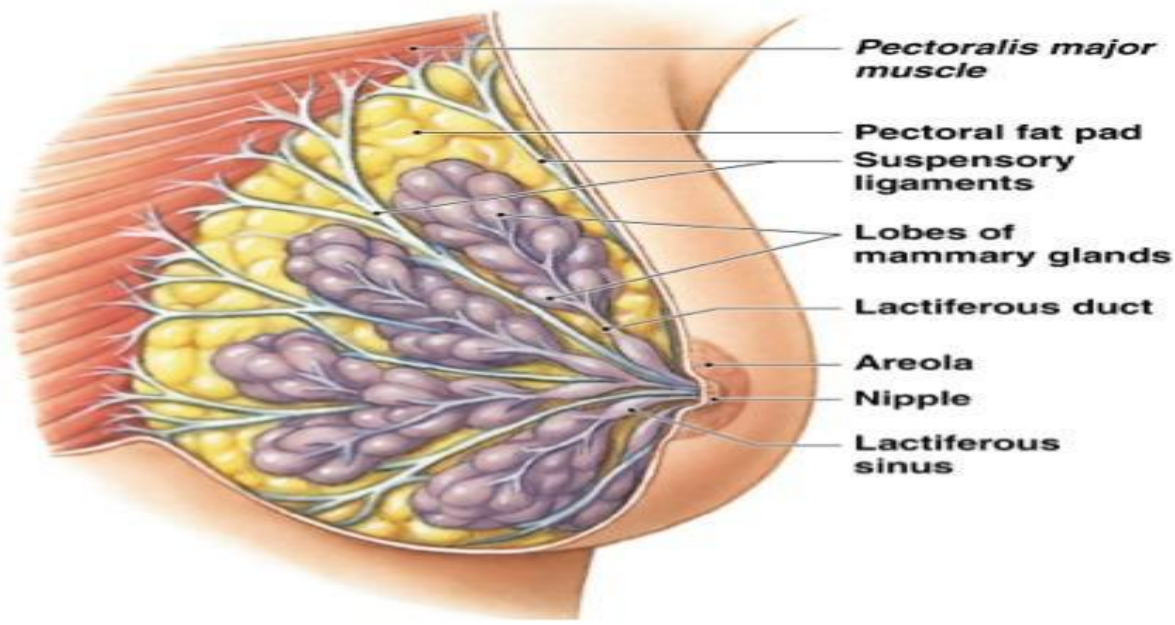
Hormones acting on breast:

Estrogen—ductal proliferation

_ *Progesterone*—glandular proliferation

_ *Prolactin*—milk secretion

_*Oxytocin* – milk ejection



Blood Supply to the Breast

_ The **lateral thoracic** artery, from the 2nd part of the axillary artery—30%.

_ The perforating cutaneous branches of **internal mammary** artery to the 2nd, 3rd and 4th intercostal spaces—60%.

_ The lateral branch of the 2nd, 3rd and 4th **inter costal** arteries.

_ Pectoral branches of **acromiothoracic** artery.

_ **Superior thoracic** artery.

Venous Drainage

_ Through **posterior intercostal** veins, venous drainage communicates with **paravertebral** venous plexus (***Batson's*** *venous plexus*). So secondaries in vertebrae, is common in carcinoma of breast.

The lymphatics

The lymphatics of the breast drain predominantly into the **axillary (85%)** and **internal mammary** lymph nodes. The axillary nodes are arranged in the following groups:

• lateral, along the axillary vein;

• anterior, along the lateral thoracic vessels;

• posterior, along the subscapular vessels;

• central, embedded in fat in the centre of the axilla;

• interpectoral, a few nodes lying between the pectoralis major and minor muscles;

• apical, which lie above the level of the pectoralis minor tendon in continuity with the lateral nodes and which receive the efferents of **all** the other groups.

The apical nodes are also in continuity with the supraclavicular nodes and drain into the subclavian lymph trunk.

The **sentinel** node is defined as **the first** lymph node draining the tumour-bearing area of the breast.

The internal mammary nodes are fewer in number. They lie along the internal mammary vessels deep to the plane of the costal cartilages, drain the posterior third of the breast.

INVESTIGATION OF BREAST SYMPTOMS

History and clinical examination are the **most important** methods of detecting breast disease.

Mammography

Soft tissue radiographs, they are low-voltage, high amperage x-rays. The dose of

radiation is low (very **safe**). The sensitivity of this investigation **increases with age** as the breast becomes less dense.

Its used in **screening** for ca breast as a 2 yearly image for women > 40 yrs.

Digital mammography allows manipulation of the images and computer-aided diagnosis. Tomo-mammography is also being assessed as a more sensitive diagnostic modality.

Ultrasound

Ultrasound is particularly useful in **young** women with dense breasts, and in

distinguishing cysts from solid lesions, or to localise impalpable areas of breast pathology.

Magnetic resonance imaging (MRI)

• It can be useful to **distinguish** scar from recurrence in women who have had previous breast conservation therapy for cancer.

• Lobular cancer is diagnosed to assess for **multifocality** and **multicentricity** and can be used to assess the extent of DCIS (ductal carcinoma *in situ*).

• It is the best imaging modality for the breasts of women with **implants**.

• Screening tool in **high-risk** women (because of family history).

• It is less useful than ultrasound in the management of the axilla in both primary breast cancer and recurrent disease.

Needle biopsy/cytology

Histology can be obtained under local anaesthesia using a spring-loaded core needle biopsy device. Cytology is obtained using a 21G or 23G needle and 10-mL syringe. Fine-needle aspiration cytology (**FNAC**) is the **least invasive** technique of obtaining a cell diagnosis and is rapid and very accurate if both operator and cytologist are experienced. **Core biopsy** allows a **definitive** preoperative diagnosis, differentiates between duct carcinoma ***in situ*** and **invasive** disease and also allows the tumour to be stained for receptor status.

Triple assessment

In any patient who presents with a breast **lump** or other symptoms **suspicious** of carcinoma, the diagnosis **should** be made by a combination of ***1-*** clinical assessment, ***2-***radiological imaging and a ***3-***tissue sample taken for either cytological or histological analysis. The positive predictive value (**PPV**) of this combination should exceed **99.9 %.**

THE NIPPLE

Absence of the nipple*(Athelia*) is rare and is usually associated with amazia (congenital absence of the breast).

Supernumerary nipples (*polythelia*) not uncommonly occur along a line extending from the anterior fold of the axilla to the fold of the groin (the milk line of lower mammals). Rarely, there is duplication of the nipple on a normal areola.

Nipple retraction

This may occur at **puberty** or **later** in life.

Retraction occurring at puberty(**simple** nipple inversion) , is of unknown aetiology (benign horizontal inversion). In 25 % of cases it is bilateral. It may cause problems with breastfeeding and infection can occur, especially during lactation, because of retention of secretions.

Recent retraction of the nipple may be of considerable pathological significance. A *slit-like* retraction of the nipple may be caused by *duct ectasia* and *chronic periductal mastitis*, but *circumferential* retraction, with or without an underlying lump, may well indicate an underlying *carcinoma*.

Treatment

Treatment is usually **unnecessary** and the condition may spontaneously resolve during pregnancy or lactation.

Simple **cosmetic** surgery, but has the drawback of dividing the underlying ducts.

Mechanical **suction devices**.

Cracked nipple

This may occur during **lactation** and be the forerunner of acute **infective mastitis**. If the nipple becomes cracked during lactation, it should be rested for **24–48 hours** and the breast should be **emptied** with a breast pump. Feeding should be resumed as soon as possible.

Papilloma of the nipple

It has **the same** features as any cutaneous papilloma and should be excised with a tiny disc of skin. Alternatively, the base may be tied with a ligature.

Retention cyst of a gland of Montgomery

If they become blocked a sebaceous cyst forms.

Eczema

Eczema of the nipples is a rare condition and is often **bilateral**; it is usually associated with eczema elsewhere on the body. It is treated with 0.5 per cent hydrocortisone (not a stronger steroid preparation).

Paget's disease

Paget's disease of the nipple must be distinguished from eczema. The former is caused by malignant cells in the **subdermal** layer and is usually associated with a carcinoma within the breast. Eczema tends to occur in younger people who have signs of eczema elsewhere (look at the antecubital fossae).

Discharges from the nipple

Discharge from the *surface*

_ Paget's disease

_ Skin diseases (eczema, psoriasis)

_ Rare causes (e.g. chancre)

Discharge from a *single* duct

_ Blood-stained

Intraduct papilloma

Intraduct carcinoma

Duct ectasia

_ Serous (any colour)

Fibrocystic disease

Duct ectasia

Carcinoma

Discharge from *more than one* duct

_ Blood-stained

Carcinoma

Ectasia

Fibrocystic disease

_ Black or green

Duct ectasia

_ Purulent

Infection

_ Serous

Fibrocystic disease

Duct ectasia

Carcinoma

_ Milk:

Lactation

Rare causes (hypothyroidism, pituitary tumour)

Treatment

Exclude a **carcinoma** by occult blood test and cytology. Simple **reassurance** may then be sufficient but, if the discharge is proving intolerable, an operation to remove the affected duct or ducts can be performed (**microdochectomy**).

Ductoscopy (inspection of the internal structure of the duct system) using microendoscopes +/_ biopsy.

Cone excision of the major ducts (subareolar resection). When the duct of origin of nipple bleeding is **uncertain** or when there is bleeding or discharge from **multiple** ducts, the **entire** major duct system can be **excised** for histological examination. It is vital to warn the patient that she will be **unable to breastfeed** after this and may experience altered **nipple sensation**.

BENIGN BREAST DISEASE

The **most common** cause of breast problems; up to **30 %** of women will suffer from a benign breast disorder requiring treatment at some time in their lives. The most common symptoms are **pain**, or a **lump**. The aim of treatment is to **exclude cancer** and, to **treat** symptoms.

Amazia

Congenital absence of the breast may occur on one or both sides. It is more common in males.

Polymazia

Accessory breasts have been recorded in the axilla (the most frequent site), groin, buttock and thigh. They have been known to function during lactation.

Mastitis of infants

On (**3rd-4th**) day of life, if the breast of an infant is pressed lightly, a drop of colourless fluid can be expressed; a few days later, there is often a slight milky secretion '**witch's milk**' , which disappears during the third week. It is **physiological** & caused by stimulation of the fetal breast **by prolactin**. True **mastitis** is uncommon and is predominately caused by *Staphylococcus aureus*.

Diffuse hypertrophy

Occurs sporadically in healthy girls at **puberty** (benign virginal hypertrophy) and, less often, during the **first pregnancy**. The breasts attain **enormous** dimensions and may reach the knees when the patient is sitting. The condition is often bilateral. It is caused by an alteration in the normal **sensitivity of the breast to oestrogen**. Treatment is with **anti-oestrogens**, or by **reduction mammoplasty**.

Injuries of the breast

Haematoma

It gives rise to a lump, which, in the absence of overlying bruising, is difficult to diagnose correctly unless it is biopsied.

Traumatic fat necrosis

It may be acute or chronic and usually occurs in stout, middle-aged women. Following a blow, or even indirect violence (e.g. contraction of the pectoralis major),

a **lump**, often **painless**, appears. This may **mimic a carcinoma**, even displaying skin tethering and nipple retraction, and **biopsy** is required for diagnosis. A seatbelt may transect the breast with a sudden deceleration injury, as in a road traffic accident.

Acute and subacute inflammations of the breast

Bacterial mastitis

It is the **most common** variety of mastitis and is associated with **lactation**.

Aetiology

Lactational mastitis is seen far less frequently than in former years. Most cases are caused by ***S. aureus***. The intermediary is usually the **infant**; after the second day of life, 50 % of infants harbour **staphylococci in the nasopharynx**.

Although ascending infection from a sore and **cracked nipple** may initiate the mastitis, in many cases the lactiferous ducts will first become blocked by epithelial debris leading to stasis (high incidence in women with a retracted nipple). Once within the ampulla of the duct, staphylococci cause **clotting** of milk and, within this clot, organism multiply.

Clinical features

Classical signs of acute inflammation. Early on this is a generalised **cellulitis** but later an **abscess** will form.

Treatment

During the cellulitic stage the patient should be treated with an appropriate **antibiotic** (flucloxacillin or co-amoxiclav). Feeding from the affected side may **continue** if the patient can manage. **Support** of the breast, local **heat and analgesia**.

If an antibiotic is used in the presence of **undrained** pus, an '**antibioma**' may form that takes **many weeks** to resolve. **Drainage** if the infection did not resolve within 2 days, or other evidence of an underlying abscess. Repeated aspirations under antibiotic cover (if necessary using ultrasound for localisation) can also be performed, and the pus sent for bacteriological **culture**. **Fluctuation is a late** sign in breast abscess.

Tuberculosis of the breast

It is rare, & usually associated **with active pulmonary TB** or tuberculous **cervical adenitis**. It occurs more often in parous women and usually presents with multiple **chronic abscesses and sinuses**. The diagnosis rests on bacteriological and histological examination. Treatment is with anti-tuberculous chemotherapy +/_ mastectomy.

Mondor's disease

Thrombophlebitis of the superficial veins of the breast and anterior chest wall & the arm. The only treatment required is restricted arm movements and, the condition **subsides within a few months** without recurrence, complications or deformity.

Duct ectasia/periductal mastitis

Pathology

This is a **dilatation** of the breast ducts, which is often associated with **periductal inflammation**. The pathogenesis is **obscure**, & it is much more common in **smokers**. There is dilatation in one or more of the larger lactiferous ducts, which fill with a **stagnant brown or green** secretion which cause **irritant reaction** in surrounding tissue leading to **periductal mastitis** or even **abscess** and **fistula** formation. In some cases, a chronic indurated subareolar **mass** forms. Fibrosis may cause slit-like nipple **retraction**.

An **alternative** theory suggests that **periductal** inflammation is **the primary** condition. A marked association between recurrent periductal inflammation and smoking (arteriopathy or increases the virulence of the commensal bacteria).

Clinical features

Nipple discharge (of **any colour**), a subareolar mass, abscess, mammary duct fistula and/or nipple retraction.

Treatment

Carcinoma must be **excluded**. **Antibiotic** (co-amoxiclav or flucloxacillin and metronidazole). Surgery is the **only hope** for cure; this consists of **excision** of all of the major ducts (**Hadfield's operation**).

Aberrations of Normal Development and Involution ANDI

It is to describe a **mixture of physiological** changes and **disease** processes according to a variety of clinical, pathological and aetiological terminology.

Aetiology

The pathogenesis of ANDI involves **disturbances in the breast physiology** extending from a perturbation of **normality to well-defined disease** processes. There is often little correlation between the histological appearance of the breast tissue and the symptoms.

Pathology

Consists of **four** features that may vary in extent and degree:

1 **Cyst** formation. Inevitable and very variable in size.

2 **Fibrosis**. Fat and elastic tissues disappear and are replaced with dense white fibrous trabeculae.

3 **Hyperplasia of epithelium** in the lining of the ducts and acini, with or without atypia.

4 **Papillomatosis**. Papillomatous overgrowth within the ducts.

Clinical features

They are variable with a **wide range** of benign conditions, but often include

an area of **lumpiness** (seldom discrete) and/or breast pain (**mastalgia**).

• A benign discrete: **cyst** or fibroadenoma. True lipomas occur rarely.

• Lumpiness may be bilateral, commonly in the upper outer quadrant .

• Non-cyclical mastalgia is more common in perimenopausal women.

'Breast' pain in postmenopausal women not taking hormone replacement therapy (HRT) is usually derived from the chest wall, back or neck. A **5%** of breast cancers exhibit **pain** at presentation.

Treatment of lumpy breasts

If the clinician is confident that he or she is not dealing with a discrete abnormality (mammography and/or ultrasound **scanning**) . Firm **reassurance**, & review the patient at a different point in the menstrual cycle.

Treatment of mastalgia:

Firm **reassurance** . Fitting and supportive bra at the day and a soft bra at night. **Avoiding caffeine** drinks. Symptom **diary** help to chart the pattern of pain throughout the month (to know its relation to cycle).

Medications: **Oil of evening primrose**, for more than 3 months, will help more than half of these women, esp. those over 40 years. Others: Anti-gonadotrophin such as **danazol** 100 mg three times a day , or a prolactin inhibitor, such as **bromocriptine**, anti-oestrogen, for example **tamoxifen**, or a luteinising hormone-releasing hormone **(LHRH) agonist** to deprive the breast epithelium of oestrogenic drive. **No role** of surgery.

For non-cyclical mastalgia, exclude **extramammary** causes such as chest wall pain. Non-steroidal analgesics or by injection with local anaesthetic on a 'trigger spot'.

Breast cysts

Most commonly in the **last decade** of reproductive life. They are often **multiple**, may be bilateral and can mimic malignancy. Diagnosis can be confirmed by aspiration and/or ultrasound. They typically present **suddenly**.

Treatment

A **solitary** cyst or **small** collection of cysts can be **aspirated**. However, 30 % will recur and require reaspiration. If there is a **residual lump** or if the fluid is **blood-stained**, or if the cyst **reforms** repeatedly, a core biopsy or local excision for **histological** diagnosis is advisable. This will exclude cystadenocarcinoma, which is more common in elderly women.

Galactocoele

Rare ,solitary subareolar cyst and always dates from lactation. It contains milk and in long-standing cases its walls tend to calcify.

Fibroadenoma

Arise in the fully developed breast between the ages of (**15- 25**) years. It is the **most common benign** tumour of the breast **below 30** years of age. They arise from hyperplasia of a single lobule and usually grow up to 2–3 cm in size, & surrounded by a well-marked capsule . A fibroadenoma **does not** require excision *unless* associated with suspicious cytology, it becomes very large or the patient expressly desires the lump to be removed.

Giant fibroadenomas (**>5 cm**) occasionally occur during puberty. They are often rapidly growing but, its management is similar to that of smaller fibroadenomas. They are more common in the Afro-Caribbean population. Fibroadenoma ***does not*** turn into malignancy.

Phyllodes tumour (serocystic disease of Brodie or cystosarcoma phyllodes)

These **benign** tumours, , usually occur in women > **40** years. They present as a **large**, sometimes massive, tumour with an unevenly **bosselated surface**. Occasionally, **ulceration** of overlying skin occurs because of pressure necrosis. They remain mobile on the chest wall. Histologically, there is a **wide variation**, with some of low malignant potential resembling a fibroadenoma and others having a higher mitotic index, which are histologically worrying. The latter **may recur** locally & **may metastasise** via the bloodstream.

Treatment

Treatment for the benign type is **enucleation** in young women or **wide local excision**. Massive tumours, recurrent tumours and those of the malignant type will require **mastectomy**.

CARCINOMA OF THE BREAST

Breast cancer is the **most common** cause of death in middle-aged women in Western countries. In England and Wales, **1 in 12** women will develop the disease during their lifetime.

Aetiological factors

Geographical

Occurs commonly in the Western world.

Age

Rare < 20 years but, thereafter, the incidence steadily rises with increasing age.

Gender

Less than 0.5 per cent of patients with breast cancer are male.

Genetic

It occurs more commonly in women with a family history of breast cancer. Breast cancer related to a specific mutation accounts for **5%** of breast cancers. Mutation of tumour suppressor genes *BRCA1/BRCA2* is thought to be involved with high-risk of breast carcinoma.

Diet

More in 'developed' world, where diets low in phyto-oestrogens. A high intake of alcohol is associated with an increased risk of developing breast cancer. Vitamin C reduces the risk.

Endocrine

Breast cancer is more common in *nulliparous* women and breastfeeding in particular appears to be *protective*. Also protective is having a first *child at an early* age, especially if associated with *late menarche* and *early menopause*. It is known that in postmenopausal women, breast cancer is more common in the *obese*. This is thought to be because of an increased conversion of steroid hormones to oestradiol in the body fat. *Exogenous* hormones, e.g oral contraceptive pill and HRT also increase risk.

Previous radiation

Women who have been treated with mantle radiotherapy as part of the management of Hodgkin's disease.

Pathology

Breast cancer may arise from the **epithelium** of the duct system anywhere from the nipple end of the major lactiferous ducts to the terminal duct unit. The disease may be entirely ***in situ***, or may be ***invasive*** cancer. The degree of differentiation(nuclear pleomorphism, tubule formation and mitotic rate) has three grades: well differentiated, moderately differentiated or poorly differentiated.

Previously, **descriptive** terms were used to classify breast cancer ('**scirrhous'**, meaning woody, or '**medullary'**, meaning brain-like). More recently, **histological** descriptions have been used. Gene array analysis of breast cancers has identified five subtypes. Some of these correlate with known markers such as **oestrogen receptor** status. There are specific gene signatures that are said to correlate with response to **chemotherapy** or poor **prognosis**; trials based upon these differences are planned.

Current nomenclature

Ductal carcinoma is the most common variant with lobular carcinoma occurring in up to 15% of cases. Rarer histological variants, usually carrying a better prognosis, include **colloid** or **mucinous** carcinoma, whose cells produce abundant mucin, **medullary** carcinoma, with solid sheets of large cells often associated with a marked lymphocytic reaction, and tubular carcinoma.

I**nflammatory carcinoma** is a fortunately rare, **highly aggressive** cancer that presents as a painful, swollen breast, which is warm with cutaneous **oedema** (d.t. blockage of the subdermal lymphatics). It involves at least one-third of the breast and may mimic a breast abscess.

In situ carcinoma **is preinvasive** cancer that has **not** breached the epithelial basement membrane, is becoming increasingly common because of the advent of mammographic **screening**. *In situ* carcinoma may be ductal (**DCIS**) or lobular (**LCIS**), the latter often being multifocal and bilateral. Both are **markers** for the later development of invasive cancer in at least **20 %** of patients.

Staining for **oestrogen and progesterone receptors** is now considered routine, as their presence will indicate the use of adjuvant hormonal therapy with tamoxifen or an aromatase inhibitor. Tumours are also stained for c-erbB2 (also known as **HER-2/neu**) (a growth factor receptor) as patients who are positive can be treated with the monoclonal antibody **trastuzumab** (Herceptin®), either in the adjuvant or relapse setting.

Paget's disease of the nipple

It is a **superficial** manifestation of an underlying breast carcinoma. It presents as an **eczema-like** condition of the nipple and areola, which persists despite local treatment. The nipple is eroded slowly and eventually disappears. Nipple eczema should be **biopsied** if there is any doubt about its cause. Microscopically, there are **large**, ovoid cells with abundant, clear, pale-staining cytoplasm in the **Malpighian** layer of the epidermis.

The spread of breast cancer

Local spread

It to involves the skin and to penetrate the pectoral muscles and even the chest wall if diagnosed late.

Lymphatic metastasis

Occurs primarily to the **axillary (85%)** and the **internal mammary** lymph nodes (posterior one-third of the breast). Involvement of **supraclavicular** nodes and of any contralateral lymph nodes represents advanced disease.

Spread by the bloodstream

It is by this route that skeletal metastases occur. In order of frequency, the lumbar vertebrae, femur, thoracic vertebrae, rib and skull and these deposits are generally osteolytic. Metastases may occur in the liver, lungs and brain and, occasionally, the adrenal glands and ovaries.

Clinical presentation

Breast cancer is found most frequently in the **upper outer** quadrant. Most breast cancers will present as a **hard lump**, which may be associated with **indrawing** of the nipple. As the disease advances locally there may be **skin involvement** with peau d'orange or frank ulceration and fixation to the chest wall. This is described as cancer-en-cuirasse when the disease progresses around the chest wall.

Peau d'orange in advanced ca.

Staging of breast cancer

Using the **TNM** (tumour–node–metastasis).

Tumour:

T0 – No evidence of primary. Tis – Carcinoma *in situ* (DCIS or LCIS)

Tis Paget's – Paget's disease of nipple with no tumour (with tumour underneath is staged according to size)

T1 mic – Microinvasion < 0.1 cm.

T1— Tumour size < 2 cm in greatest diameter (T1a—0.1-0.5 cm; T1b—0.5-1.0 cm; T1c—1-2 cm).

T2 – Size 2-5 cm.

T3 – Size > 5 cm.

T4 – Tumour fixed to chest wall or skin (T4a—fixed to chest wall, T4b—fixed to skin, T4c-T4a + T4b, T4d—inflamatory carcinoma breast).

Node:

NX – Nodes cannot be assessed. N0 – No nodes.

N1 mic – Node with micrometasiasis.

N1 – Axillary nodes—ipsilateral, mobile, discrete.

N2 – N2a – Axillary nodes—ipsilateral fixed to one another and other structures.

N2b – *Clinically apparent** and ipsilateral internal mammary nodes in the absence of clinically palpable axillary nodes. * *Clinically apparent* means nodes detected by imaging/clinically/ pathologically.

N3 –

N3a – Spread to ipsilateral infraclavicular lymph nodes with or without axillary nodes.

N3b – Spread to ipsilateral internal mammary nodes and axillary nodes.

N3c – Spread to ipsilateral supraclavicular lymph nodes with/ without axillary or internal mammary nodes.

Metastasis:

MX – Metastases cannot be assessed.

M0 – No metastasis.

M1 – Distant Metastases.

Stage I : T1N0M0

Stage IIa : T0N1M0; T1N1M0; T2N0M0.

Stage IIb : T2N1M0; T3N0M0

Stage IIIa : T0N2M0; T1N2M0; T2N2M0; T3N1M0; T3N2M0

Stage IIIb : T4N0M0; T4N1M0; T4N2M0

Stage IIIc : Any TN3M0

Stage IV : Any T, any N, M

Early breast cancer—Stage I and II; T1N1, T2N1; T3N0

Locally advanced breast cancer (LABC)—Stage IIIA, IIIB

Prognosis of breast cancer

The best indicators of likely prognosis in breast cancer remain tumour **size**, **grade** and **lymph node** status. Other scores assess the histological grade of the tumour, hormone receptor status, measures of tumour proliferation such as S-phase fraction, growth factor analysis and oncogene or oncogene product measurements. Prognostic indices (such as the Nottingham prognostic index) have combined these factors to allow subdivision of patients into discrete prognostic groups.

Treatment of cancer of the breast

The **two** basic principles of treatment are to reduce the chance of local recurrence and the risk of metastatic spread. Treatment of **early** breast cancer will usually involve **surgery** with or without **radiotherapy**. **Systemic** therapy such as chemotherapy or hormone therapy is added if there are **adverse** prognostic factors such as lymph node involvement.

The multidisciplinary team approach

In many specialist centres the care of breast cancer patients is undertaken as a joint venture between the surgeon, medical oncologist, radiotherapist and allied health professionals such as the clinical nurse specialist

Treatment of carcinoma breast *is usually through a combined approach*

_ *Surgery _ Radiotherapy _ Hormone therapy _ Chemotherapy*

Algorithm for management of operable breast cancer

_ Achieve **local** control

_ Appropriate **surgery**

Wide local excision (clear margins) and radiotherapy,

or

Mastectomy ± radiotherapy (offer reconstruction – immediate or delayed)

Combined with **axillary** procedure

Await final pathology and receptor measurements

Use risk assessment tool; stage if appropriate

_ Treat risk of **systemic** disease

Offer chemotherapy if prognostic factors poor; include Herceptin if Her-2 positive

Radiotherapy as decided above

Hormone therapy if oestrogen receptor or progesterone receptor positive

Surgery

Surgery still has a **central role** to play in the management of breast cancer but there has been a gradual shift towards **more conservative** techniques, backed up by clinical trials that have shown **equal efficacy** between mastectomy and local excision followed by radiotherapy.

Mastectomy is *indicated* for 1-large tumours (in relation to the size of the breast), 2-central tumours beneath or involving the nipple,3- multifocal disease, 4-local recurrence or 5- patient preference.

The **radical** (Halsted) mastectomy, which included excision of the breast, axillary lymph nodes and pectoralis major and minor muscles, is no longer indicated as it causes excessive morbidity with no survival benefit. The **modified radical** (Patey) mastectomy is more commonly performed. **Simple** mastectomy involves removal of

only the breast with no dissection of the axilla, except for the region of the axillary tail of the breast, which usually has attached to it a few nodes low in the anterior group.

Patey mastectomy :The breast and associated structures are dissected *en bloc*:

• the whole breast;

• a large portion of skin, the centre of which overlies the tumour but which always includes the nipple.

• all of the fat, fascia and lymph nodes of the axilla.

The pectoralis minor muscle is either divided or retracted to gain access to the upper two-thirds of the axilla.

Conservative breast cancer surgery

This is aimed at removing the **tumour plus** a rim of at least **1 cm of normal** breast tissue somewhat higher rate of local recurrence following conservative surgery. This is commonly referred to as a **wide local excision**. The term lumpectomy should be reserved for an operation in which a benign tumour is excised and in which a large amount of normal breast tissue is not resected. A **quadrantectomy** involves removing the entire **segment** of the breast that contains the tumour. Both of these operations are usually combined with **axillary surgery**, usually via a separate incision in the axilla. There are various options that can be used to deal with the axilla, including sentinel node biopsy, sampling, removal of the nodes behind and lateral to the pectoralis minor (level II) or a full axillary dissection (level III).

The presence of metastatic disease within the axillary nodes remains the best single marker for prognosis. Removal of the internal mammary lymph nodes is unnecessary.

Sentinel node biopsy

In patients with clinically **node-negative** disease. The sentinel node is localised **peroperatively** by the injection of patent blue dye and radioisotopelabelled albumin in the breast. The marker passes to the **primary node** draining the area and is detected visually and with a hand-held gamma camera. Peropererative diagnosis allows completion axillary clearance if nodal disease is detected. In patients in whom there is **no tumo**ur involvement of the sentinel node, further axillary dissection can be **avoided**.

Radiotherapy

Radiotherapy to the chest wall after mastectomy is indicated in selected patients in whom the risks of **local recurrence** are high. This includes patients with large tumours and those with large numbers of positive nodes or extensive lymphovascular

invasion. It is conventional to **combine conservative** surgery with radiotherapy to the remaining breast tissue.

Adjuvant systemic therapy

The appropriate use of adjuvant chemotherapy or hormone therapy will improve relapse-free survival. Women with hormone **receptor positive** tumours will obtain a worthwhile benefit from about five years of endocrine therapy, either 20 mg daily of tamoxifen if **premenopausal** or the newer aromatase inhibitors (anastrozole, letrozole and exemestane) if **postmenopausal**. It is no longer appropriate to give hormone therapy to women who do not have oestrogen or progesterone receptor-positive disease.

Hormone therapy

Tamoxifen is the most widely used 'hormonal' treatment in breast cancer. Other hormonal agents used include the LHRH agonists, which induce a reversible ovarian suppression.

Chemotherapy

First-generation regimen such as a 6 monthly cycle of cyclophosphamide, methotrexate and 5-fluorouracil (**CMF**) will achieve a *25 %* reduction in the risk of relapse over a 10 year period. CMF is no longer considered adequate adjuvant chemotherapy and modern regimens include an **anthracycline** (doxorubicin or epirubicin) and the newer agents such as the **taxanes**.

Follow up of breast cancer

Followed **for life** to detect recurrence and dissemination by yearly or two-yearly mammography of the treated and contralateral breast.

Phenomena resulting from lymphatic obstruction in advanced breast cancer

Peau d'orange

It is caused by cutaneous **lymphatic oedema**. Where the infiltrated skin is tethered by the sweat ducts it cannot swell, leading to an appearance like **orange skin**. Occasionally, seen over a **chronic abscess**.

Lymphoedema

Late oedema of the arm is a troublesome complication of breast cancer treatment, especially if radical axillary **dissection** and **radiotherapy** are combined. An oedematous limb is susceptible to **bacterial infecti**ons following quite minor trauma

and these require vigorous antibiotic treatment. Treatment is **difficult** but limb elevation, elastic arm stockings and pneumatic compression devices.

Cancer-en-cuirasse

The **skin of the chest** is infiltrated with carcinoma and has been likened to a **coat**, in cases with local **recurrence** after mastectomy and sometimes follow the distribution of **irradiation** to the chest wall.

Lymphangiosarcoma

Rare complication of lymphedema with an onset many **years** after the original treatment as multiple subcutaneous **nodules** in the upper limb. The prognosis is **poor** but some cases respond to cytotoxic therapy or irradiation, or rarely interscapulothoracic (forequarter) amputation.

Breast reconstruction

Following mastectomy, women can now be offered **immediate** or **delayed** reconstruction of the breast. The easiest type of reconstruction is using a **silicone gel implant** under the pectoralis major muscle.

If the skin at the mastectomy site is poor (e.g. following radiotherapy) or if a larger volume of tissue is required, a **musculocutaneous flap** can be constructed either from the latissimus dorsi muscle (**an LD flap**) or using the transversus abdominis muscle (a **TRAM flap**). The latter gives an excellent cosmetic result.

These procedures usually followed by **nipple reconstruction**. Tattooing of the reconstructed nipple, or a prosthetic nipple is often required. External breast **prostheses** that fit within the bra are the most common method of restoring volume fill.

Familial breast cancer

Less than **5 %** of all cases of breast cancer. Recent developments in molecular genetics and the identification of a number of breast cancer predisposition genes (*BRCA1*, *BRCA2* and *p53*)

The ***BRCA1*** gene has been associated with an increased incidence of *breast* (and *ovarian*) cancer, *colorectal* and *prostate* cancer, and is located on the long arm of chromosome **17** (17q). ***BRCA2*** is located on chromosome **13**q and there is an association with *male breast* cancer. Those who prove to be 'gene positive' have a **50–80 % risk** of developing breast cancer, predominantly while premenopausal. Many will opt for **prophylactic** mastectomy.

THE MALE BREAST

Gynaecomastia

Idiopathic

Hypertrophy of the male breast may be unilateral or bilateral. The breasts enlarge at puberty and sometimes present the characteristics of female breasts.

Hormonal

Often accompanied stilbestrol therapy for prostate cancer, now rarely used. It may also occur in teratoma of the testis, in anorchism and after castration, or a feature of ectopic hormonal production in bronchial carcinoma and in adrenal and pituitary disease. Bodybuilders may use steroids to improve their physique, which may cause gynaecomastia.

.Associated with leprosy

This is possibly because of bilateral testicular atrophy.

Associated with liver failure

Patients with cirrhosis as a result of failure of the liver to metabolise oestrogens. It is also seen with certain drugs such as cimetidine, digitalis and spironolactone.

Associated with Klinefelter syndrome

A sex chromosome anomaly having 47XXY trisomy.

Treatment

Reassurance ,if not, mastectomy with preservation of the areola and nipple.

Carcinoma of the male breast

Carcinoma of the male breast accounts for less than **0.5 %** of all cases of breast cancer. The predisposing causes include **gynaecomastia** and excess endogenous or exogenous **oestrogen**.

Treatment

Stage for stage the treatment is **the same** as for carcinoma in the female breast and prognosis depends upon stage at presentation. Adequate local excision, because of the small size of the breast, should always be with a ‘mastectomy’.