

Role of the surgeon in the management of breast cancer

The surgeon has a vital role in the management of patients with breast cancer.

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The management of breast cancer needs a multidisciplinary approach. The surgeon has a vital role in the management of many patients, particularly those with early disease. Surgery may be needed to:

- diagnose the disease: see the chapter on diagnosis and screening
- control local disease
- accurately stage the patient's disease
- reduce the risk of breast cancer in high risk patients.

In this chapter, surgery will be divided up into surgery of the breast and surgery of the axilla.

Surgery of the breast

Timing of the surgery

Surgery may be done as the primary management of breast cancer. This tends to be the case for early breast cancer, and adjuvant therapy in the form of systemic treatment or radiotherapy follows. Surgery may be done after neoadjuvant hormone therapy or chemotherapy. (Neoadjuvant therapy is systemic therapy given before surgery.) This was a policy reserved for large or locally advanced tumours or inflammatory carcinoma to render them operable but is increasingly being done for cosmetic reasons. There is no survival advantage to using neoadjuvant therapy (Table I).

Table I. Neoadjuvant therapy and surgery – advantages and disadvantages

Surgery followed by adjuvant therapy	Neoadjuvant therapy followed by surgery
Allows accurate staging of the cancer	Shrinkage of the tumour may allow more cosmetic surgery
Psychological advantage of having no palpable mass	Surgery can be used to give a break in chemotherapy and allow recovery of the patient
	Monitoring the tumour size allows assessment of responsiveness to treatment

Therapeutic surgery

The aim of therapeutic breast surgery is to adequately treat breast cancer and to minimise asymmetry of the breasts. This is known as oncoplastic surgery. Radiation can significantly alter the shape of the breast.

Oncological procedures fall into 2 categories: breast-conserving surgery and mastectomy. Breast-conserving surgery has been practised for many decades and has been shown to be associated with the same outcome as mastectomy in the majority of patients.

Mastectomy

The indications for a mastectomy can be seen in Table II, and variations of the procedure given in Table III.

Table II. Indications for a mastectomy

Absolute indications

- Women with >2 tumours in separate quadrants
- Previous irradiation to the chest wall
- Pregnancy: contraindication to radiotherapy but can have breast-conserving therapy after neoadjuvant chemotherapy
- Persistent positive margins

Relative indications

- Collagen vascular disease
- Multiple tumours in same quadrant with indeterminate microcalcifications
- Tumour size:breast size ratio

Non-mitigating factors

- Positive nodes
- Tumour location
- Family history
- High-risk systemic disease

Without reconstruction, the majority of patients have a simple mastectomy without an axillary procedure. With increasing use of adjuvant therapy, a radical mastectomy is seldom performed.

Reconstruction

There have been many advances in breast reconstruction. Research indicates that patients undergoing reconstruction regain their confidence and femininity. However, it is ultimately a personal

Table III. Variations of mastectomy

Type of mastectomy	Operative procedure
Radical mastectomy	Removal of breast, axillary contents and underlying pectoral muscle
Modified radical mastectomy	Removal of the breast and axillary contents
Simple mastectomy	Removal of the breast
Skin-sparing mastectomy	Removal of the breast with preservation of the skin flaps and the inframammary fold if possible – this is done for immediate reconstruction

choice, and not every patient wants reconstruction. Furthermore, in those patients who do want it, the choices may be restricted for various reasons.

In principle, the reconstructions that may be undertaken are

- immediate, i.e. at the time of mastectomy
- delayed, i.e. reconstruction is undertaken after the mastectomy. The earliest this can be is 4 - 6 months after mastectomy, but it can take place at any stage, even years after the mastectomy.

Reconstruction can be achieved by means of a prosthetic reconstruction, autologous reconstruction, or a tissue expander. In a prosthetic reconstruction a silicone gel prosthesis (or a tissue expander prior to this) is used. In autologous reconstruction one's own tissue is used. The transverse rectus abdominis myocutaneous (TRAM) is commonly used. The deep inferior epigastric perforator (DIEP) flap is a form of TRAM flap requiring microsurgery. The latissimus dorsi (LD) is also used. It may be prudent to combine a prosthesis with an LD flap.

Timing of reconstruction

There have been two major advances in mastectomy. One of these, the skin-sparing mastectomy, means that all the breast skin (but not the nipple or areola) and usually the inframammary fold are retained. Generally, the skin-sparing mastectomy can only be performed in patients with early-stage disease. The advantages of reconstruction are listed in Table IV.

Methods of reconstruction

Tissue expander

A tissue expander is a device (silicone balloon) used to create extra skin and is usually placed behind the pectoralis muscle. Inflation is undertaken weekly. Once expansion has been completed (usually 6 weeks - 3 months) the expander is removed and the hole created by the expander can be filled by either a prosthesis or autologous tissue (Fig. 1).

The advantages of a tissue expander are that it is a quick, simple operation, it can be used in immediate or delayed reconstruction,

and it creates breast skin of normal colour. The disadvantages are that it is a 2-stage procedure and requires regular follow-up for inflation. In the case of complications such as severe infection, the expander needs to be removed.

Some expanders are designed to be permanent and do not require a second operation, but these are not commonly used.

Prosthesis

The prostheses used are textured silicone gel, and saline prostheses are now seldom used. Advances in prosthesis reconstruction have occurred, leading to the availability of contoured (breast-shaped) prostheses, with improved results. In general, the

reconstruction is a quick, simple operation and the results have improved with newer prostheses.

The major disadvantage is the formation of capsular contraction. This results in the breast being hard. It is more commonly seen after reconstruction than after augmentation and while this problem has been reduced over the years, it is still in the region of 5 - 10%. It is a very common complication after radiotherapy. Cosmetic problems may occur as the prosthetic reconstructed breast does not change much with time, and the contralateral breast may require surgery to counteract the natural ptosis.

Complications, such as infection, are uncommon but can occur, especially after radiotherapy.

Autologous reconstruction

The main advantage of autologous reconstruction is that the patient's own tissue is used. If a skin paddle is used with the flaps, the skin has a different colour. The TRAM, or its variation, is most commonly performed (Fig. 2). The TRAM offers the patient a simultaneous abdominoplasty – which is attractive to many patients and usually results in the most natural looking breast as fat is used for the reconstruction. It

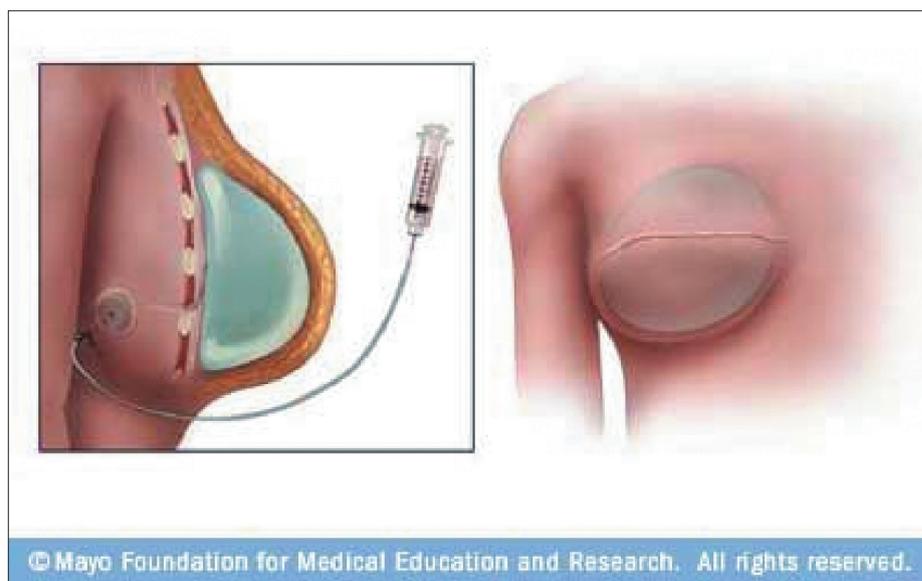
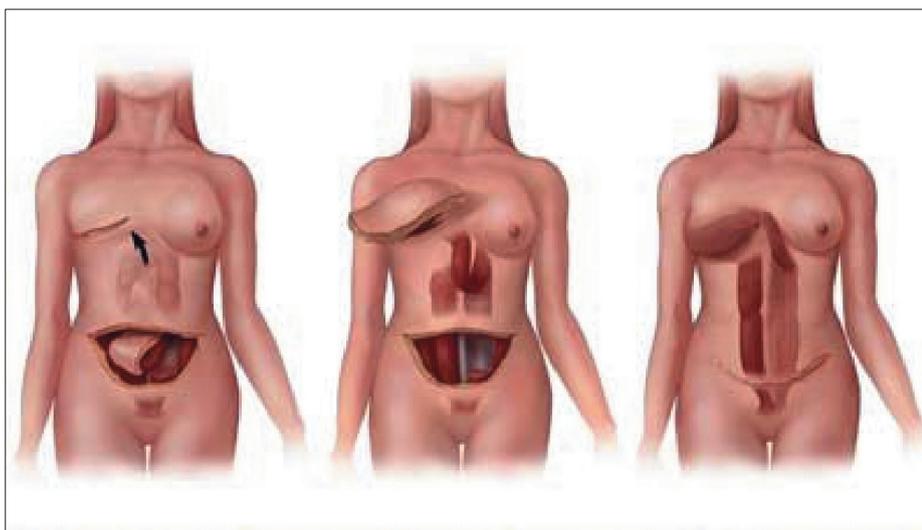


Fig. 1. Position of the expander.

Table IV. Advantages and disadvantages of reconstruction

	Advantages	Disadvantages
Immediate reconstruction	Better cosmesis One procedure Psychological advantages	Longer initial operation If radiotherapy is indicated, there may be complications
Delayed reconstruction	All breast cancer treatment is finished and the procedure is elective Management of choice if radiotherapy is likely	Increases the number of procedures necessary Patient has to have a flat chest, which may add to depression



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Fig. 2. The TRAM flap.

can be used after radiotherapy. However, it is a long operation – usually taking in excess of 4 hours. Complications can still occur and include hernia (5%) and fat necrosis (10%). The procedure is contraindicated in heavy smokers.

Latissimus dorsi (Fig. 3)

The latissimus dorsi (LD) is one of the largest muscles in the body, and it can be transposed from the back, either alone, or more commonly with an island of skin. Perhaps the greatest disadvantage of the LD reconstruction method is the lack of bulk, and it is now more commonly used as a salvage procedure when other methods of reconstruction fail. The bulk may be increased by the use of a prosthesis. However, it is a reliable flap and can be used in smokers and after radiotherapy. Complications may occur, particularly over the back.

Contralateral breast

The aim of all reconstruction is to achieve symmetry to avoid the patients feeling imbalanced or having difficulty with ill-

fitting bras or clothing. It is well established that 80% of patients require a contralateral procedure to achieve symmetry.

Nipple areolar reconstruction

This is most commonly undertaken 6 months after the breast mound reconstruction and is performed commonly under local anaesthetic as a day procedure. Two methods are commonly used: nipple sharing (using some of the contralateral nipple) or nipple reconstruction using a flap. Areola reconstruction is commonly achieved with a skin graft. Thereafter the nipple and areola are surgically tattooed.

Breast-conserving surgery

The terms quadrantectomy, wide local excision, breast-conserving therapy, lumpectomy, and partial mastectomy are used to describe variations of breast-conserving surgery.

In Europe, the majority of primary breast cancers can be adequately treated by breast-conserving surgery and radiotherapy. In

South Africa, the disease tends to be at a more advanced stage at the time of presentation and access to radiotherapy is limited in many areas of the country, so more patients may be treated with mastectomy.

Traditionally, surgical incisions have followed Langer’s lines, with circumferential incisions being the norm. Over the last decade there has been an increasing tendency to use more imaginative techniques, incorporating patterns used by the plastic surgeons.

The objective of surgery is to remove the tumour and a rim of normal tissue. The aim should be to remove at least 10 mm. Involvement of the margin is associated with a high rate of recurrence. Extensive ductal carcinoma *in situ* (DCIS) associated with the tumour (>25%) results in a higher local recurrence rate – larger excision margins are advised.

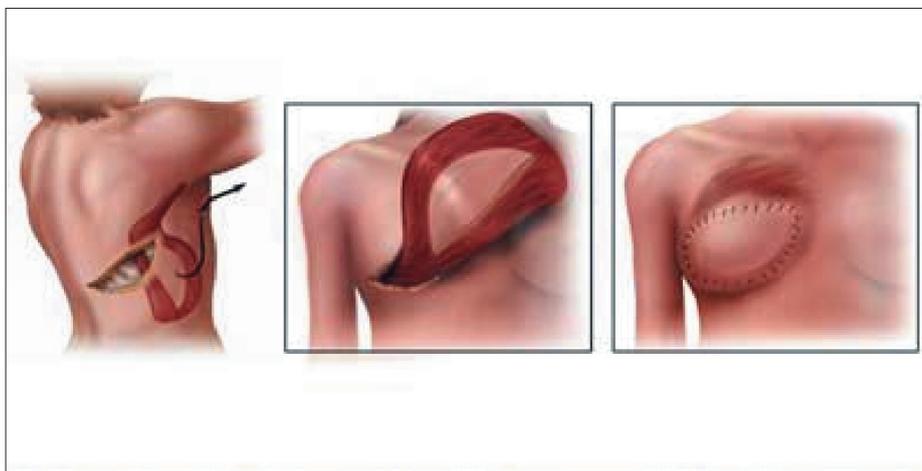
For tumours in the lower half of the breast, a modified breast reduction may be done, thus maximising symmetry. Surgery to the contralateral breast may be done at the same time or, as radiotherapy contributes to asymmetry, after 18 months (Fig. 4).



Fig. 4. Breast-conserving surgery: bilateral reduction modified to include laterally placed tumour.

Surgery of the axilla

The aim of axillary surgery is to provide accurate staging of the cancer and to control local disease. If nodes are palpable at the time of presentation for surgery, the patient should have an axillary dissection. Complications of axillary dissection are listed in Table V.



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Fig. 3. The latissimus dorsi flap.

Table V. Complications after axillary dissection	
Minor complications	
Numbness in distribution of intercostobrachial nerve (70%)	
Seroma (30%)	
Reduction in ROM of shoulder (25%)	
Lymphoedema (depends on the number nodes removed: may be minor or major complication)	
Major complications (infrequent)	
Thrombosis axillary vein	
Injury to motor nerve in axilla	

Role of the surgeon

To avoid the complications seen after an axillary clearance, some surgeons advocated a 'wait and see' approach if no nodes were palpable. That is an approach sometimes still used in patients over 75. A sentinel node biopsy is currently the management of choice for the majority of patients with no palpable nodes.

Sentinel lymph node biopsy was a procedure first described in principle in the 1960s, but was not commonly used for the staging of breast cancer until the 1990s. It is a well-established procedure and should no longer be considered to be experimental. The procedure is based on the observation that drainage of the breast is initially to a sentinel node/s and thereafter spreads to the remainder of the axillary basin. Thus, if the sentinel node can be accurately identified, tested and found to be disease free, it is

reasonable to assume that the remainder of the axilla is disease free and no further surgery is required.

The node may be identified using blue dye and/or radioisotope colloid. If the latter is used, a preoperative scintiscan shows the location of the nodes (Fig. 5). A hand-held counter is then used intraoperatively to locate the nodes, which are tested intraoperatively. If they are found to contain tumour, an axillary dissection is performed. If they are disease free, no further surgery is indicated. Postoperatively, the nodes are taken to the laboratory for further assessment with immunohistochemical techniques. About 5% of nodes are found to have micrometastases on further testing. This may result in further surgery being advised.

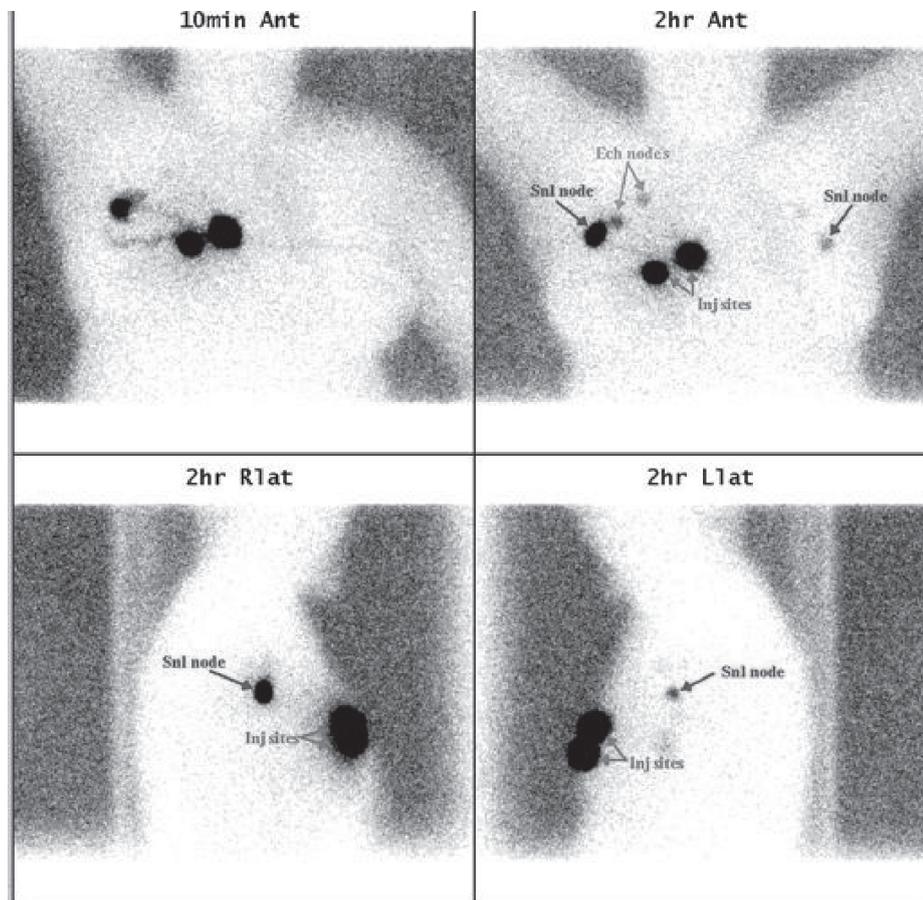


Fig. 5. Preoperative scintiscan to locate sentinel node.

Risk-reducing surgery

If a woman has an unacceptably high risk of developing breast cancer, she may consider either Tamoxifen (which reduces the risk of ER+ve tumours by 50%) or a bilateral mastectomy with immediate reconstruction (which reduces the risk of breast cancer by 98%).

Further reading

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In a nutshell

- Surgery has become more specific and less invasive.
- A multidisciplinary approach is necessary for accurate diagnosis, treatment and appropriate surgery.
- The earlier the disease, the more important surgery.
- There have been many advances in reconstruction, leading to improved results. Failure of one method does not preclude further reconstruction, and any patient desiring reconstruction can be treated.
- Not every method of reconstruction is available to all patients – it does depend on risk factors, associated illnesses and stage of disease. A good working relationship between the general surgeon and the plastic surgeon improves outcome.