Breast reconstruction after mastectomy for breast cancer: what is basic and new techniques

Essay

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Adel Samahy Hosney Ahmed

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List of Abbreviations

Abb.	Meaning
ALT	Anterolateral thigh flap
BCS	Breast conserving surgery
DIEP	Deep inferior epigastric perforator flap
ELD	Extendd latissimus dorsi
IGAP	Inferior gluteal artery perforator flap
LD	Latissimus dorsi flap
LNs	Lymph nodes
MDOT	Modified double opposing tab
MRM	Modified radical mastectomy
NAC	Nipple areola complex
NSM	Nipple sparing mastectomy
OPS	Oncoplastic surgery
SGAP	Superior gluteal artery perforator flap
SIEA	Superficial inferior epigastric artery flap
SSM	Skin sparing mastectomy
TRAM	Transverse rectus abdominis myocutaneous flap
TUG	Transverse upper gracilis flap

Abstract

- The evolution of safe and effective predictable reconstructive techniques have been coupled with better understanding of tumor biology and increased availability of plastic surgical expertise.
- The most ambitious and difficult goal in breast reconstruction is giving the patient the best chance for management of her cancer regarding the oncological safety of the procedure and best cosmetic result with no increase in the overall complications and no delay in completion of the adjuvant therapy.
- Immediate breast reconstruction has the upper hand on the late reconstruction for both the doctor and the patient, as it helps rapid restoration of psychological and physical status of the patient and makes the-procedure of reconstruction more efficient with no delay in the diagnosis or management of local recurrence and no interference with the subsequent adjuvant treatment. But, still the delayed breast reconstruction providing the safest results especially after 2 years of being disease free, metastases free avoiding flap fat necrosis, flap shrinkage or implant capsular contracture due to radiotherapy without interference with irradiation delivery or side effects of chemotherapy; lowered immunity or infection.
- So, from the study concluded that immediate-delayed breast reconstruction is the best modality:

1- SSM + axillary evacuation+ expander insertion (to preserve skin envelope).
2- Histopathology of specimen.
3- Cases candidate for radiotherapy (L.N.+ve) are postponed till finishing irradiation.
4- Cases not candidate for radiotherapy are operated upon by tram (natural texture), implant (easy and beautiful) or combined LDMF + implant.
5- NAC reconstruction and manibulation of the other breast.

By this we can gain:

- Safe.
- Satisfactory.
- Aesthetic (volume, contour, projection, symmetry, NAC) reconstructed breast.

Keywords: Superficial inferior epigastric artery flap, Skin sparing mastectomy, Transverse rectus abdominis myocutaneous flap, Transverse upper gracilis flap

INTRODUCTION

The breast is an important symbol of femininity. It plays an important role in woman life whether functionally, psychologically or emotionally. Those with breast deformities often experience loss of self-confidence that may affect their everyday life and may lead to adverse consequences including anxiety, Depression and change in body image ***(Roth, 2005)***.

Breast reconstruction is the rebuilding of a breast, usually in women. It involves using autologous tissue or prosthetic material to construct a natural-looking breast. Often this includes the reformation of a natural-looking areola and nipple. This procedure involves the use of implants or relocated flaps of the patient's own tissue.

The primary part of the procedure can often be carried out immediately following the mastectomy. As with many other surgeries, patients with significant medical comorbidities (high blood pressure, obesity, diabetes) and smokers are higher-risk candidates. Surgeons may choose to perform delayed reconstruction to decrease this risk. There is little evidence available from randomised studies to favour immediate or delayed reconstruction ***(D'Souza et al., 2011).***

Breast reconstruction can be done with, Breast implants (filled with saline or silicone). Natural tissue flaps from the patient or combination of these methods ***(Mehrara, 2014).***

In autologous tissue reconstruction, a piece of tissue is taken from elsewhere in a woman's body and used to rebuild the breast. This piece of tissue is called a flap. Different sites in the body can provide flaps for breast reconstruction. Flaps can be pedicled or free.

Pedicle flaps involve latissimus dorsi muscle flap. An implant is usually needed in addition to the latissimus flap to create enough volume for the reconstructed breast. Pedicle flaps also involve transverse rectus abdominis myocutaneous flap. This flap usually does not require an implant as long as there is enough excess skin and fatty tissue in the lower abdomen ***(Mehrara, 2014).***

Implants are inserted underneath the skin or chest muscle following the mastectomy. (Most mastectomies are performed using a technique called skin-sparing mastectomy, in which much of the breast skin is saved for use in reconstructing the breast.). Implants are usually placed as part of a two-stage procedure. The chest tissue is usually ready for the implant 2 to 6 months after mastectomy ***(Cordeiro, 2008)***.

After the chest heals from reconstruction surgery, a surgeon can reconstruct the nipple and areola. Usually, the new nipple is created by cutting and moving small pieces of skin from the reconstructed breast to the nipple site and shaping them into a new nipple. A few months after nipple reconstruction, the surgeon can re-create the areola. This is

usually done using tattoo ink. However, in some cases, skin grafts may be taken from the groin or abdomen and attached to the breast to create an areola at the time of the nipple reconstruction ***(Mehrara, 2014)***.

A mastectomy that preserves a woman's own nipple and areola, called nipple-sparing mastectomy, may be an option for some women, depending on the size and location of the breast cancer and the shape and size of the breasts ***(Petit et al., 2011).***

Lipofilling is an autologous technique used in breast reconstruction. The procedure consists of two major steps: these are liposuction and lipoinjection of the patient's own fat tissue and other tissue elements, either with or without specific preparation processes before lipoinjection. It is considered to be a minimally invasive procedure which can be effectively performed with the patient under local or general anesthesia ***(Bertossi et al., 2003).***

AIM OF THE WORK

The aim of this work is to highlight the basic and new techniques used for breast reconstruction after mastectomy, to optain best aesthetic satisfaction, oncologic safety and cosmotic outcome.

Chapter (1)

ANATOMY OF THE BREAST

Development:

At the 5th or 6th week of fetal development, two ventral bands of thickened ectoderm (mammary ridges, milk lines) are evident in the embryo, which extends from the axilla to the groin. The breast originates from the ectoderm, by forming the initial breast bud. The primary bud gives rise to a secondary bud, which in turn gives rise to the lactiferous ducts. The connective tissue is derived from the mesoderm. Breast development occurs along the milk line ***(Bland et al., 2010).***

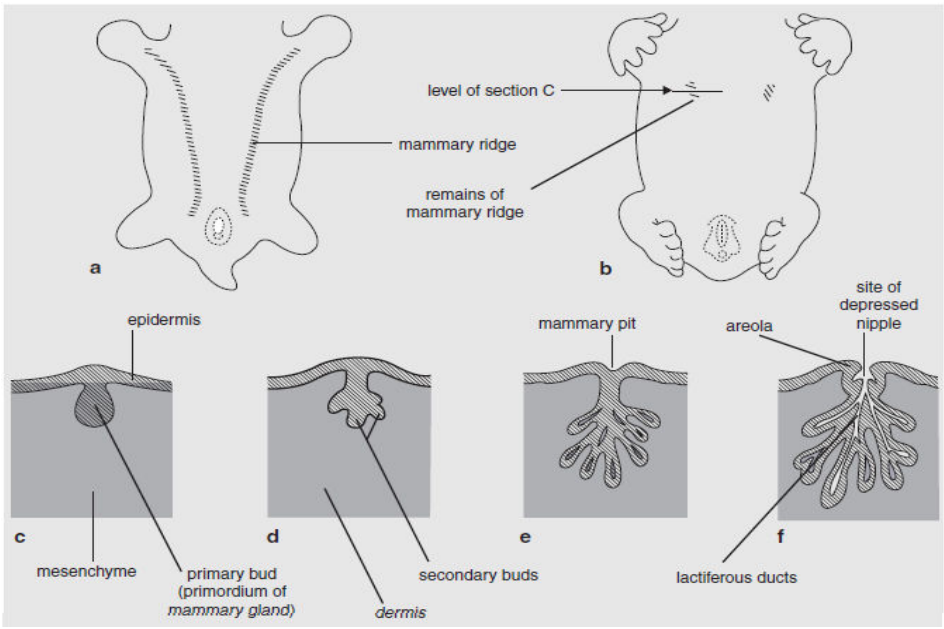

Figure (1-1): Embryonic development of the mammary glands. (a) Ventral view of a 28-day embryo, with regression of the mammary ridge by 6 weeks, as represented in (b) (c-f) Cross sections of the developing breast bud from 6 weeks to birth ***(Shermak, 2010)***.

Gross anatomy:

- **Surface anatomy:**

The adult female breast lies between the 2nd and 6th ribs and between the sternal edge and the midaxillary line. Breast tissue frequently extends into the axilla as the axillary tail of Spence.

Posteriorly, the upper portion of the breast rests on the fascia of the pectoralis major muscle; inferolaterally, it is bounded by the fascia of the serratus anterior muscle ***(Morrow and Khan, 2006).***

Ideal breast architecture

Each patient has their own opinion as to the aesthetics of their breasts, which should be given consideration with any operative alteration of the breast. Reconstruction or cosmetic enhancement of the breast not only the way the breast looks, but also how it feels to the touch. Size, symmetry, the location of the breast and its landmarks on the chest wall all play a role in the attractiveness of the breast ***(La Torre and Davis, 2013).***

Statistical standards for the dimensions of the breast have been analyzed and reported by various authors. The distance from the sternal notch to the nipple and the distance from the mid-clavicular line are each 19–21 cm. The distance from nipple to the infra-mammary fold is 5–6 cm. The distance from

the nipple to the midline is 9–11 cm. These measurements offer guidelines for altering the breast, which must be individualized, based on proportionality, variances in chest wall anatomy, posture and patient preference ***(Urban et al., 2013).***

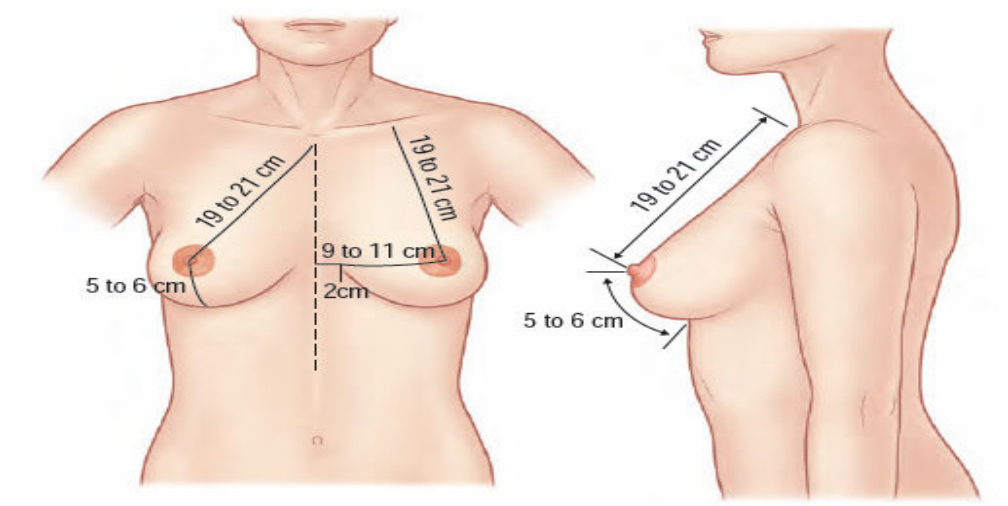

Figure (1-2): Statistical standards for the dimensions of the breast ***(La Torre and Davis 2013).***

- **Size and form:**

The size of the adult female breast varies widely among individuals, and considerable discrepancy in breast size is seen between the breasts of an individual woman. The breast is composed of skin, subcutaneous tissue, and breast tissue. The breast tissue includes both epithelial parenchymal elements and stroma. The epithelial component comprises about 10% to 15% of the breast mass, with the remainder being stroma. Each breast consists of 15 to 20 lobes of glandular tissue that are supported by a framework of fibrous connective tissue. The space between lobes is filled by adipose tissue. Variations in