



RECONSTRUCTION

ADVANCES

The latest advances in implants and autogenous tissue breast reconstruction offer women more options as they face mastectomy and reconstruction choices.

By Karen M. Horton, MD, MSc, FRCSC

Introduction

"After all the devastating surgeries, after all the healing, you want to feel that you have your body back—as much as possible—and you want it as quickly as possible. With the DIEP flap and my nipple and areola intact, I feel closer to being myself again than I ever thought I could after this ordeal. There's enough internal recovery to handle; it's wonderful that the outside is so close to perfect."

For many women like my patient above, undergoing breast reconstruction following mastectomy, the preservation of the nipple or the re-creation of a nipple through reconstruction becomes an important factor. The creation of a *nipple-areola complex (NAC)* is the final step in surgical restoration of the breast. Often considered a complement to breast reconstruction, NAC reconstruction is usually completed after an interval of several months, making use of tissue from the remaining breast skin or by taking part of the other nipple as a graft.

For women facing mastectomy and reconstruction today, the latest methods of breast reconstruction offer techniques that both preserve the native nipple and areola and remove

the need for a second reconstructive procedure, re-creating an NAC as part of the initial reconstruction of the breast. For women facing an often difficult journey, the advances achieved in breast reconstructive surgery can offer those who choose this option confidence and hope as they enter a new phase in their lives.

Nipple-sparing Mastectomy

Some women with breast cancer may be candidates for *nipple-sparing mastectomy*, which involves removal of the entire contents of the breast through an incision in the inframammary fold but preserves the areolar skin and the outer portion of the nipple.

Preservation of the nipple and the areola removes the need for a second reconstructive procedure. Candidates for preservation of the nipple and the areola include women with cancer that has not become invasive (such as *ductal carcinoma in situ*, or *DCIS*), those with small tumors that are at least 2 centimeters away from the NAC, and women with relatively small breasts and minimal droop (also known as *ptosis*).^{1,2}

During nipple-sparing mastectomy, the nipple is cored out from the inside, and a separate specimen is often sent for immediate analysis under the microscope (*frozen section pathology*). If there is any concern about abnormal cells extending into the nipple, the nipple is removed. If the tissue is clear, the nipple is preserved and reconstruction takes place during the same operation (*immediate breast reconstruction*).

Immediate Implant Reconstruction with Nipple Preservation

Breast reconstruction after nipple-sparing mastectomy can involve either implants or autogenous tissue techniques (using the body's own tissue). Traditional implant reconstruction involves two stages, in which the skin remaining after mastectomy is slowly expanded over months using a *tissue expander*. A permanent implant is placed as a second operation, and the nipple and the areola are reconstructed as a third procedure.

A new technique, *immediate implant reconstruction*, which is becoming increasingly available, does not require tissue expanders as a preliminary step and enables immediate reconstruction in a single operation.³

In immediate implant breast reconstruction, a permanent implant that is postoperatively adjustable is placed directly into the mastectomy pocket where the breast tissue was previously (Figure 1). The implant is partially inflated

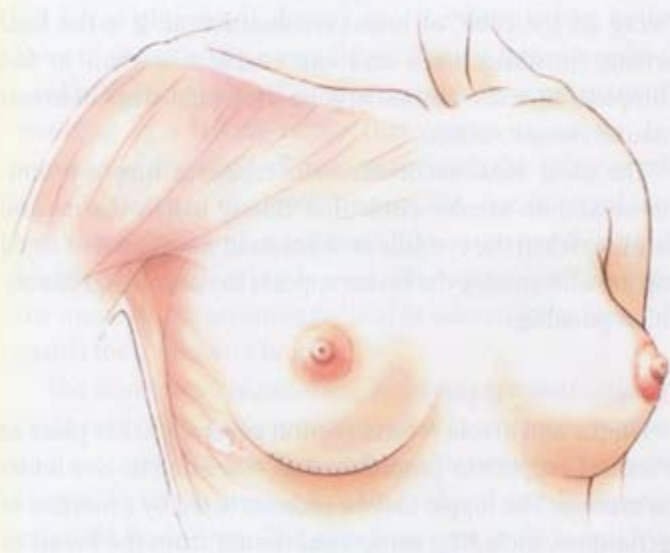


Figure 1: Nipple-sparing Mastectomy and Immediate Implant Reconstruction. A postoperative adjustable permanent implant is placed through an inframammary incision, with the port placed in a small pocket along the inframammary fold. From Loren Eskenazi, MD; used with permission.



ART IMITATES LIFE

A unique canvas and a desire to make a difference inspire artist Melany Whitney.

Artist Melany Whitney provides many women with what they come to consider the final step in the process of their breast reconstruction. "My artistry provides a 3D (nipple protrusion) and very realistic look for the completion of the areola/nipple complex," Melany says, of the micropigmentation (cosmetic tattooing) that she delivers. "Women see my work as so detailed and textured that they sometimes forget the nipples aren't nature's own work. They feel 'completed'."

With a degree in Fine Arts from Cornell University, micropigmentation might seem an unusual career path for an artist like Melany. On the contrary, she says: "When I learned that I could transfer in particular my talent for portraiture to the field of micropigmentation, I immediately set my career goals to provide cosmetic enhancement, which includes the paramedical side of tattooing." She is fueled, Melany says, by her desire to make a difference in the lives of the women she serves: "I feel very grateful that I can use my talent to help women regain their confidence, femininity, and self-esteem." She also makes sure to deliver some practical advice to her clients by informing them of their right to insurance coverage for her services (provided by the Women's Health and Cancer Rights Act).

And each interaction with a survivor, Melany says, reminds her of the prevalence of breast cancer and the value of services like hers that grant women renewed hope: "When my client cries after seeing herself looking whole again, I cry also. I am so thrilled I can help each woman regain what she has lost and move forward with her life."

Melany Whitney can be reached at (551) 804-9245 or www.permanentmkup.com

with saline at the time of surgery, and the incision beneath the breast is closed. The implant is attached to a small injection port, which is placed underneath the skin in a separate pocket. In this procedure the implant is placed beneath the breast skin, rather than beneath muscle, which results in less postoperative pain and discomfort than traditional techniques.

One to two weeks after surgery, when healing is under way and swelling has decreased, additional saline is added to the implant through a few injections into the port. The implant is fully inflated within a few weeks, and the port is later removed under local anesthesia in the office. The permanent implant remains in place, and the reconstruction is complete in a single stage.

Immediate implant reconstruction after nipple-sparing mastectomy has several advantages over traditional reconstruction: quicker recovery, less pain, no implant indentation with pectoralis major muscle motion, a natural breast shape, and no need to reconstruct the NAC.³

NAC Reconstruction

Due to oncologic (cancer-related) concerns, preservation of the NAC is not always possible or advised. When the nipple and the areola must be removed due to the type, size, or position of the cancer or because of the breast size or shape, *NAC reconstruction* is performed.

Reconstruction of the nipple and the areola truly is the "icing on the cake" of breast reconstruction. It is the final artistic finishing touch and can enable a woman to feel complete after she has undergone the initial stage of breast mound reconstruction.

The ideal NAC reconstruction creates a nipple prominence and an areolar circle that closely match the natural form, so when the eye falls on a breast in a swimsuit or fitted top (or when nude), the breast appears as natural and beautiful as possible.

How Is the Nipple Reconstructed?

Nipple and areola reconstruction generally takes place as a second outpatient procedure that takes one to two hours on average. The nipple may be reconstructed by a number of techniques, including using local tissues from the breast or tissue from other areas of the body.

Local flap nipple reconstruction. Local flap nipple reconstruction makes use of tissue from the remaining surrounding breast skin and subcutaneous fat. Wings (or *local flaps*)

of tissue are elevated, rotated, and sutured in a formation that re-creates a nipple prominence resembling the other nipple. This leaves a small scar on the breast mound that is then covered up by the areola reconstruction.

Free nipple graft reconstruction. If only one breast is to be reconstructed and if the other nipple is of sufficient size, sometimes reconstruction can make use of the remaining nipple. This involves taking part of the normal nipple as a *free composite graft* and transplanting it to the reconstructed side. Below the graft, new blood vessels grow into the nipple piece and enable it to survive, similar to what occurs in a skin graft procedure.

Other nipple reconstruction techniques. Occasionally, other techniques are used for nipple reconstruction. These can include the use of autogenous tissue such as cartilage or dermis-fat grafts that are taken from elsewhere on the body and transplanted as a graft to the breast reconstruction.

How Is the Areola Reconstructed?

The areolar circle may be reconstructed by various means. Usually, a medical tattoo is performed at the same time as the nipple reconstruction. An alternative to this practice is reconstruction of the areola with skin grafts.

Medical tattoo. Like other types of tattooing, with a *medical tattoo* pigment is driven into the dermis (the bottom layer of the skin) by a rapidly oscillating tattoo needle (or needles). The body takes this pigment up permanently, resulting in a lasting tattoo that creates an areola. In a *unilateral* (single-sided) reconstruction, the other areolar color is matched as closely as possible. For *bilateral* (double) reconstructions, a pigment that corresponds with the body's natural coloring is used. Photographs taken before the mastectomy are often helpful in selecting the best color match for a woman's breasts.

The advantages of tattooing for areola reconstruction include simplicity, patient participation in choosing pigment, and avoidance of additional scars. Tattooing may be performed in the doctor's office under local anesthesia, with minimal downtime. The disadvantages include mild fading of the pigmentation over time and the possible need for retattooing in the future.

Skin graft techniques. Alternatively, the areola can be reconstructed using the body's own tissue. *Skin grafts* are

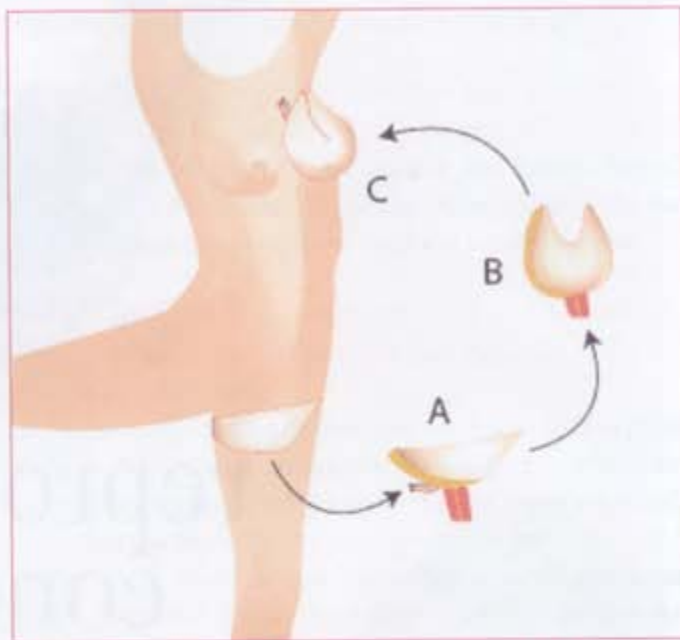


Figure 4: The Inner-thigh (TUG) Flap. Tissue is taken from the upper inner thigh, coned into a natural breast shape, and transplanted to blood vessels in the chest area using microsurgery. From Rudy Buntic, MD; used with permission.

traditionally harvested from the inner thigh, the labia, or the areola of the other breast, if it is enlarged. The darkly pigmented skin is transplanted to the reconstructed breast, and healing occurs via the same process as for a free nipple graft (blood vessel ingrowth over time).

Potential disadvantages of skin graft techniques include the creation of scars where the tissue is removed, the risk of incomplete survival of the skin graft, and a loss of pigment (*hypopigmentation*) or resultant darkening of the graft (*hyperpigmentation*) during healing. For these reasons tattooing is the most common technique for areola reconstruction.

Immediate NAC Reconstruction with the Inner-thigh Flap

Whereas implant breast reconstruction makes use of an internal prosthesis, microsurgical breast reconstruction transplants the body's own tissue to create a new breast (*autogenous reconstruction*). One of the newest types of autogenous tissue reconstructive procedures is the *inner-thigh flap*, or *transverse upper gracilis (TUG) flap*.

The TUG flap is taken from the upper inner-thigh area, in the same distribution as a cosmetic inner-thigh lift. It provides a permanent, warm, soft, and shapely breast reconstruction and also enables immediate nipple and areola reconstruction.

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