



California Pacific
Medical Center

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Breast Reconstruction Update: State-of-the-Art Techniques

BREAST RECONSTRUCTION

At California Pacific Medical Center breast reconstruction specialists bring new and advanced surgical options to the physicians we serve and the patients they care for. Working collaboratively, our breast reconstruction experts provide comprehensive patient care using leading-edge technology for treating the most complex breast cancers and medical conditions. Through this procedure profile, our physicians illustrate a variety of microsurgical techniques providing a clear view of the breast reconstruction options available to your patients.

At California Pacific Medical Center we go beyond medicine to treat the whole person, not just the illness. Our promise to our patients is to deliver the highest quality expert care with kindness and compassion. Because medicine can transform a body, but going beyond medicine can transform a life.

For patient referrals:

1-888-637-2762

Beyond Medicine.

OVER THE PAST FEW YEARS, great strides have been made in breast reconstruction. Although traditional techniques such as the pedicled TRAM flap and multiple-stage implant reconstructions are commonly performed and are still excellent reconstructive options, progress has been made in decreasing donor site morbidity and the total number of operations necessary in the reconstructive process.

Recent advances include new techniques in microsurgical reconstruction and refinement of skin sparing mastectomy techniques to provide completely natural reconstructions with minimal scarring. This update will describe some of the latest advances and procedures in breast reconstruction: (1) nipple-sparing mastectomy with single-stage immediate reconstruction, and (2) additional options in microsurgical breast reconstruction.

Nipple-sparing mastectomy and single-stage breast reconstruction

Total mastectomy while preserving the entire skin envelope—including the nipple-areolar complex (NAC)—is safe and oncologically sound in selected patients, and leads to a completely natural-appearing reconstructed breast. Patient satisfaction is frequently higher than with traditional skin-sparing mastectomy, which involves removing and reconstructing the NAC.

The literature on nipple-sparing breast surgery with immediate reconstruction demonstrates it is oncologically safe. The largest study, a series of 61 patients published in 2003, had a single patient that was easily detected, and she was treated with wide local excision of nipple with preservation of the areola. An additional series of 48 patients undergoing NAC-sparing mastectomy,

published by the Cleveland Clinic in 2004, showed only three partial nipple necroses and no local recurrences.

However, in all series reconstructions were accomplished with flaps and tissue expanders placed under the muscle, leading to less natural outcome with indentation of the breast with motion. No series discussed single-stage reconstruction with adjustable implants. This is one of the reasons early attempts at subcutaneous mastectomy with immediate reconstruction, practiced as early as

Patient 1:

Preoperative, 10-day postoperative, and 1-year postoperative result of immediate breast reconstruction following bilateral nipple-sparing mastectomies. Note that total survival of a transiently ischemic nipple is common.



Pre-operatively



10-day post-operatively



1-year post-operatively

Patient 2:

Preoperative and 1-year postoperative result of immediate breast reconstruction with bilateral nipple-sparing mastectomies and single-stage implant reconstruction.



Pre-operative



1-year post-operative bilateral mastectomy and one-stage reconstruction.

25 years ago, lost popularity. Additionally, earlier subcutaneous mastectomies were performed by plastic surgeons often—for questionable indications—with variable removal of breast tissue.

Currently, we perform single-stage reconstruction with adjustable implants on patients undergoing nipple-preserving mastectomy, with excellent results and minimal morbidity. The key to success with this new technique is wise choice of candidates and experience with the procedure.

What is microsurgery?

Microsurgery is surgery that is performed under the operating microscope, using specialized microinstruments and magnification. Microsurgical breast reconstruction transfers tissue from the abdomen,

inner thighs or elsewhere on the body to the chest area. The blood supply to a segment of tissue (a “flap”) is isolated on an artery and vein(s) from the donor site and transferred to the recipient site on the chest, where the blood vessels are reattached (“anastomosed”) under the microscope.

Options in microsurgical breast reconstruction

Free flaps used for breast reconstruction include the free TRAM flap, the DIEP flap, the SIEA flap, and the TUG flap, among others. These flaps are called “autogenous” tissue reconstruction (they use the patients’ own tissue). They have a robust blood supply that can counteract the effects of previous radiation or infection, and are often the procedures of choice when other types of reconstruction are unsuccessful.

The free TRAM flap

The free *Transverse Rectus Abdominis Myocutaneous* (TRAM) flap transfers skin and fat tissue from the lower abdomen together with the rectus abdominis muscle to reconstruct a breast. Sacrifice of this muscle can lead to abdominal wall hernia, bulge, and weakness (inability to do sit-ups). Some surgeons perform “muscle-sparing” free TRAMs, which leave some of the muscle behind but still create a defect on the abdominal wall. However, new microsurgical options that do not remove any abdominal muscles are now available. These procedures have the advantages of less pain, shorter recovery time, and less “donor site morbidity” (loss of function or appearance at the donor site).

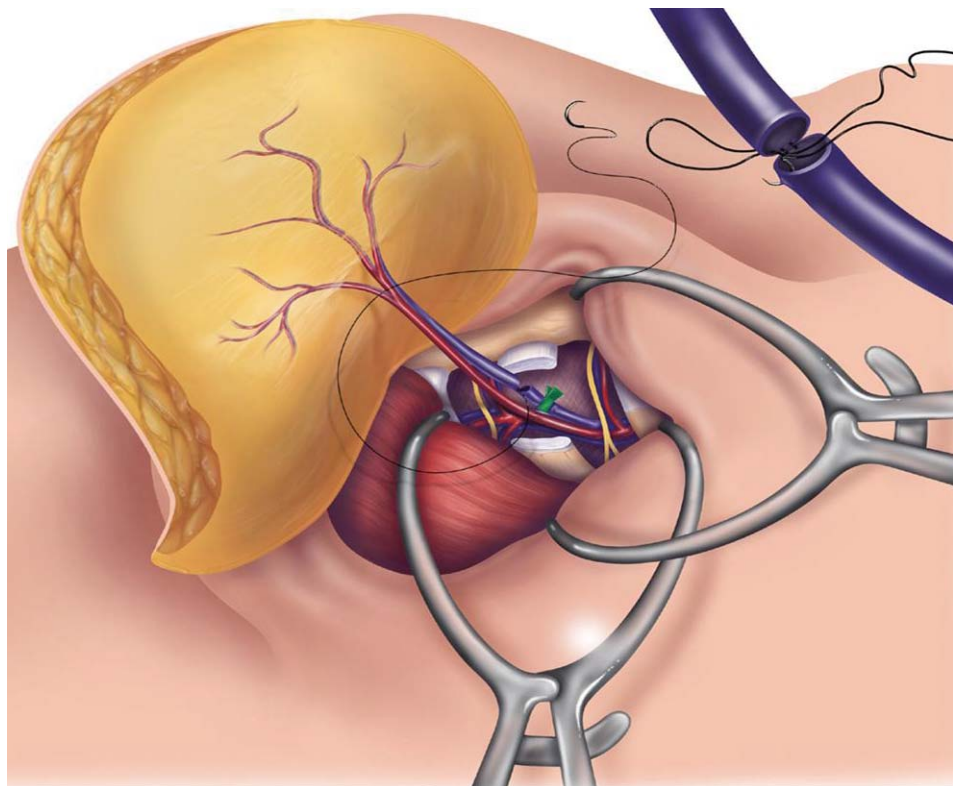


FIGURE 1: Microvascular Anastomosis: Flap blood vessels are being reconnected to blood vessels in the chest area using microsurgical techniques (insert, upper right: close-up of internal mammary vessel ends being sutured together). ILLUSTRATION USED WITH PERMISSION FROM EDWARD BUCHEL, M.D.

Patient 3:

Preoperative (top) and early postoperative result of right nipple-sparing mastectomy, free DIEP flap breast reconstruction, with left balancing mastopexy (breast lift).

**The DIEP flap**

The *Deep Inferior Epigastric artery Perforator* (DIEP) flap is the most common microsurgical option for breast reconstruction. DIEP is named for the blood vessel that supplies the skin and the subcutaneous tissue of the lower abdomen in the same distribution as the TRAM flap. The DIEP flap, however, does not include any muscle. This avoids the potential risks to the abdominal wall that exist with the TRAM flap.

A particular advantage of the DIEP flap is that it can look almost exactly like the breast, with a consistency and feel similar to breast tissue. The DIEP flap is recommended following radiation therapy to the chest

because it brings with it a new and robust blood supply to counteract the effects of radiation. The reconstruction is permanent—it is soft, reliable, and lasts for the rest of the woman's life, without many of the disadvantages of breast implants. Closure of the donor site results in the bonus of a "tummy tuck."

The DIEP flap is usually the first-line choice of reconstruction due to the superiority of the abdominal tissue over other sites. However, in certain cases, such as previous abdominoplasty, TRAM reconstruction, or possibly in previous abdominal liposuction, this tissue may not be available.

If the volume of tissue from the abdomen is insufficient to fill a mastectomy defect, an implant may be placed beneath a flap at the time of the initial procedure with excellent results. For this specific situation, this is most commonly done for traditional pedicled TRAM flaps and has proven to be a reliable reconstruction.

The SIEA flap

The SIEA flap contains the exact same tissue as the DIEP flap, but is based on a different blood vessel system. SIEA stands for the *Superficial Inferior Epigastric Artery*, the blood vessel that directly supplies this flap. The SIEA flap makes use of the superficial blood supply to the skin and fat of the abdomen, while the DIEP flap uses the deep blood supply.

Only approximately 30% of people have an SIEA vessel that is visible during surgery and that can be used for microvascular anastomosis. This is not known until the time of surgery and cannot be tested preoperatively. Advantages of the SIEA flap include a shorter operating time, less surgical dissection, and little to no abdominal discomfort after surgery. Recovery time is often less than for the DIEP flap and significantly less than the TRAM flap. Disadvantages include the fact that fewer than

30% of individuals have this blood vessel, and it may or may not be large enough for microvascular anastomosis.

The TUG flap

The TUG flap stands for the *Transverse Upper Gracilis* flap. The TUG flap is taken from the upper inner thigh area, in the same distribution as a cosmetic inner thigh lift. Part or all of the gracilis muscle, which is not missed following its removal, is included to ensure a reliable blood supply. Using tissue from the inner thigh provides for soft and shapely breast reconstruction and can also enable immediate nipple reconstruction. Rarely, the location and number of scars on the abdomen from previous surgery can interfere with the blood supply to a DIEP or SIEA flap. In this case, a free flap from elsewhere on the body, such as the inner thigh (the TUG flap), is rapidly becoming the technique of second choice for microsurgical breast reconstruction technique when abdominal tissue is unavailable.

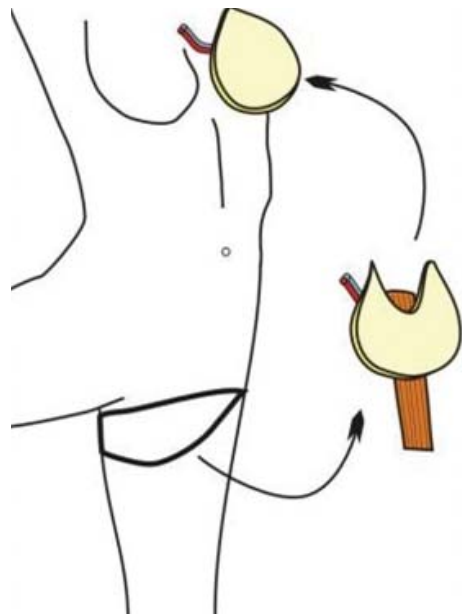


FIGURE 2: The TUG Flap: Tissue is taken from the upper inner thigh together with the gracilis muscle and transferred by microvascular anastomosis to the chest area.

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Who is a candidate for microsurgical breast reconstruction?

Healthy, physically active, non-smoking patients with enough abdominal tissue to create a breast mound are good candidates. Often, women have excess abdominal skin and fat following pregnancy; therefore, they also can benefit from the tummy tuck closure. In addition, radiation of the breast prior to reconstruction or anticipated radiation following surgery is another indication for the microsurgical reconstruction of the breast.

Smokers and patients with diabetes or blood clotting problems are not good candidates for microsurgery.

Artistry in breast reconstruction

Designing orientation and placement of incision on the breast is essential to achieving the most natural results. General surgeons and plastic surgeons work together to accomplish the goals of optimal oncologic care combined with ideal aesthetic outcome. In 2006, it is not sufficient to simply create a breast mound that looks acceptable in a bra, it should look at least as beautiful and natural as the original breast.

Reconstruction of the breast is an individualized procedure. Every patient is different. Thus the true artistry of reconstruction is to be able to weigh the wishes, desires, and anatomy of each patient so that the most appropriate procedure for a particular patient can be chosen.

References

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Patient referral for breast reconstruction

Most patients require referral from their primary care provider or physician specialist prior to breast reconstruction procedure scheduling. However, depending on insurance benefits, patients can self-refer for evaluation.

Insurance coverage

Most insurance plans cover breast reconstruction. In order to avoid unexpected medical expenses, it is always best for patients to contact their insurance company to confirm coverage for this service and obtain prior authorization.

For More Information

For patient referrals or more information about California Pacific Medical Center's breast health and breast reconstruction services, please call 1-888-637-2762.

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