



California Pacific  
Medical Center

A Sutter Health Affiliate

Community Based, Not For Profit

# Advanced Breast Reconstruction Surgery

## Deep Inferior Epigastric Perforator (DIEP) Flap Procedure

### MICROSURGERY

At California Pacific Medical Center we are committed to bringing new and advanced diagnostic tools, medical treatments, and surgical options to the physicians we serve and the patients they care for. Working jointly, our plastic surgeons and breast health professionals provide your patients with comprehensive care utilizing state-of-the-art medical and surgical techniques.

For patient referrals:  
(888) 637-2762

[www.cpmc.org/women/breast](http://www.cpmc.org/women/breast)

### Why reconstruct a lost breast?

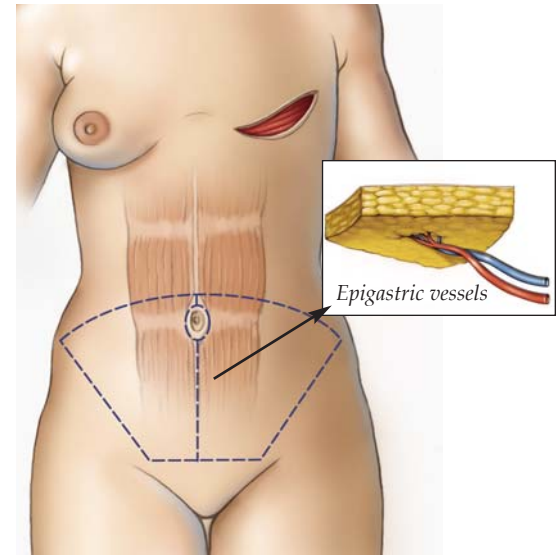
Over 200,000 new breast cancer cases are diagnosed annually in the United States. When mastectomy is part of your patient's treatment plan, women may also consider immediate breast reconstruction. Losing a breast is traumatic, both emotionally and physically. Using breakthrough microsurgery techniques, California Pacific's plastic-microsurgeons make rebuilding a lost breast at the time of surgery a part of your patient's recovery, restoring a sense of wholeness experienced by many women who have lost a breast. Using muscle-sparing microsurgical techniques, plastic surgeons rebuild a natural breast from autogenous tissue in the operating room immediately following mastectomy or even years after mastectomy has been performed. Although there are many breast reconstruction procedures available, the perforator flaps are unique in providing autogenous tissue while preserving important muscles.

### What is a DIEP flap procedure?

Similar to other breast reconstruction procedures, the DIEP flap uses tissues harvested from the patient's lower abdomen. The abdominal skin, fat, and deep inferior epigastric vessels that supply necessary blood are removed and replanted to create a natural-looking and aging breast. The abdominal wall tissue is characteristically similar to breast tissue, enhancing the aesthetic outcome. This procedure is done without using the rectus abdominis muscle. Sparing these muscles decreases post-surgical pain levels, expedites recovery, and reduces a patient's chance of developing a hernia or a bulge in the abdomen, complications associated with reconstructive procedures that utilize the rectus muscle.

### How does it differ from other autogenous reconstructive procedures?

All autogenous flaps involve creating a breast using tissue taken from other parts of the body, such as the back, abdomen, or buttocks. In one type of flap surgery, called a pedicle flap, the tissue remains attached to its original blood supply. The tissues are tunneled beneath the skin to the chest, creating the breast mound. The most common pedicle flap for breast reconstruction is the transverse rectus abdominis



*DIEP Procedure: Autogenous tissue removal area for breast reconstruction*

myocutaneous (TRAM) flap from the lower abdominal wall. This flap requires the harvest of nearly one entire rectus abdominis muscle, which carries the blood vessels, subcutaneous fat, and skin to create a breast. TRAM flap allows for a natural-looking and aging breast, but a small percentage of women have suffered complications of abdominal weakness, hernias, or bulges.

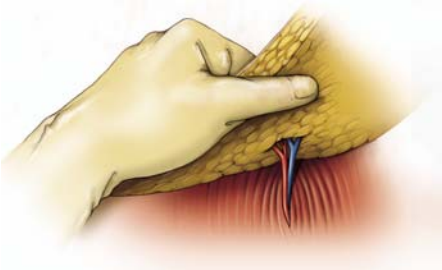
Another flap technique, called a free flap, uses tissue that is surgically removed from the abdomen, thighs, or buttocks and then transplanted to the chest by reconnecting the blood vessels to new ones in that region. The TRAM flap can be performed as a free flap. A free TRAM removes only a portion of the rectus abdominis muscle. The DIEP flap dissects the blood vessels through the muscle, preserving the muscle tissue.

### Why is DIEP done?

When a breast is reconstructed with autogenous tissue, the results are more natural and there are no concerns of a silicone implant. Many patients have the added benefit of an improved abdominal contour, as the tissue removed is equivalent to a tummy tuck procedure. No muscle is sacrificed with the DIEP procedure; therefore the patient experiences less post-surgical pain and retains abdominal wall strength, resulting in fewer post-surgical complications.

## Who is a candidate?

Women can choose to have breast reconstruction at the time of mastectomy, or they may choose reconstructive surgery at a later date. Nearly every woman can opt for a DIEP reconstruction procedure—one exception being women who lack enough abdominal fat tissue to create a breast. Younger women who are extremely athletic may fall in this category, and may choose an alternative reconstructive solution. Additionally, women who are medically unable to withstand a lengthy surgery (six hours or more), should discuss breast reconstruction options with their oncologist.



*Muscle-sparing perforator flap removal*

## What is the recovery time?

Patients spend their first post-surgical night in the intensive care unit (ICU), after which they are transferred to the surgical hospital floor where they stay an average of four days. After discharge home, most patients—depending on their general health—are able to resume usual activities within 6 to 12 weeks.

## What are the risks associated with DIEP?

While no procedure is risk free, the risks of breast reconstruction may include bleeding, fluid collection and swelling at surgical site, excessive scar tissue, infection, and tissue necrosis. Follow-up with the surgeon and oncologist are routine to ensure close monitoring and quality of care.

## Case Study

A 47-year-old female presented to discuss breast reconstruction. In April 2000 she underwent left modified radical mastectomy for a 4.5 cm left lobular breast cancer. Following mastectomy, she underwent chemotherapy and radiation therapy,

which was completed in 2001. Besides breast cancer, the patient's medical history was negative except for a slightly elevated blood pressure.

## TREATMENT:

Her physical examination revealed an adequate abdominal pannus for autogenous reconstruction. After extensive discussion with the patient regarding surgical reconstruction options and risks, the patient decided to proceed with the DIEP reconstruction procedure. Due to a positive family history and abnormal mammograms, the patient chose to have a prophylactic mastectomy of her right breast.

Under high-power magnification, the pectoralis major muscle was split along its fiber over the fourth rib. The deep perichondrium was then incised and the internal mammary artery and veins identified.

An elliptical incision was then made in the lower abdomen, approximately 2 cm above the umbilicus. The subcutaneous dissection was performed through the fat down to the level of the rectus abdominis fascia. Several perforators were identified and preserved as they pierced the rectus



*Before and after bilateral DIEP breast reconstruction*

fascia. The fascia was incised and the perforators were dissected through the rectus abdominis muscle. The first flap was harvested with the right deep inferior epigastric vessels visualized as they entered the muscle, and divided at their origin. The perforator flap was brought with its vessels through the rectus abdominis muscle. No muscle was taken with this flap. The flap was transferred to the left chest and secured. A second flap was harvested from the left lower abdomen using the same technique and transferred to the right chest and secured. Dissection of both the internal mammary artery and vein was performed after flap harvest to allow for microvascular anastomosis. The abdominal donor site was closed and all surgery sites were dressed with large bulky dressings. The patient was transferred to the intensive care unit in good condition for post-operative monitoring.

## OUTCOME:

The patient had little post-operative pain or discomfort. She was discharged after five days using over-the-counter pain medication. The patient was able to return to work at 10 weeks post-op. Nipple reconstruction was done four months postoperatively; nipple/areolar tattooing was done two months later. At her four-month follow-up appointment, she showed well-healed reconstruction sites with symmetrically sized breasts.

## For more information

For more information on DIEP breast reconstruction, please contact California Pacific's Physician Referral Coordinators at (888) 637-2762.

## Location

California Pacific Medical Center  
Davies Campus  
Castro & Duboce Streets  
San Francisco, California 94114  
(888) 637-2762

[www.cpmc.org/women/breast](http://www.cpmc.org/women/breast)