

► Minimally Invasive Deep Inferior Epigastric Perforator (mi-DIEP) Breast Reconstruction for Pain Reduction, Improved Cosmesis

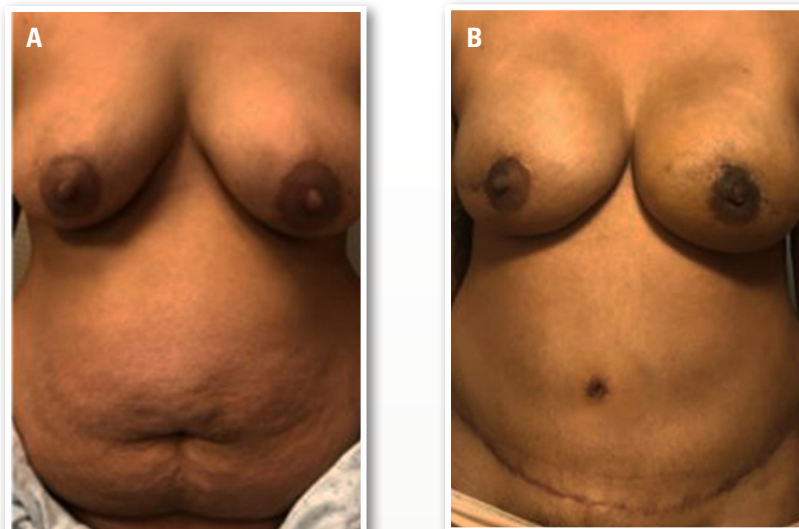
Led by surgeon Suhail Kanchwala, MD, plastic and reconstructive surgeons have performed more than 120 Minimally Invasive Deep Inferior Epigastric Perforator (mi-DIEP) procedures at Penn Medicine.

The hallmarks of the mi-DIEP technique include a radical reduction in pain, quicker recovery to normal function, superior cosmetic results and the virtual elimination of the need for perioperative or postoperative opioid medications. The majority of patients are managed with short hospital stays and over-the-counter medications.

The minimally invasive procedure begins at the time of mastectomy with the placement of a spacer in the breast and the initiation of a surgical delay, a procedure involving the identification of an abdominal perforator by CT angiogram. The ideal perforator is selected and all others are then ligated. This allows for the subsequent dilation and expansion of the deep inferior epigastric systems. The delay ensures that all patients are able to have surgery that avoids injury to the abdominal wall musculature.

Two to three weeks later, the vessel is retrieved through a reduced 1–2 cm incision in the fascia using either a laparoscopic or robotic approach similar to minimally invasive hernia surgery. A key contributor to successful outcomes has been a team approach with advances in surgical technique paired with similar advances in anesthesia and postoperative care. All patients are enrolled in a coordinated Enhanced Recovery Protocol, which means that from the minute they enter the hospital, the focus is on recovery and getting back to normal as fast as possible.

A principal benefit of Dr. Kanchwala's technique is its elimination of damage to the abdominal wall, a primary source of chronic pain during breast reconstruction surgery and recovery. Additionally, enhanced planning allows for a lower scar on the abdomen similar to that of cosmetic abdominoplasty. In cases of limited donor site volume the mi-DIEP procedure can be combined with a small implant to enhance shape and projection.



► **Figure 1:** A 47-year-old patient prior to bilateral mastectomy for breast cancer (A) and one year after two-stage mi-DIEP breast reconstruction surgery (B).

CASE STUDY

Mrs. M, a 47-year-old woman, was referred to the Division of Plastic Surgery at Penn Medicine for a second opinion for bilateral mastectomy and reconstruction for breast cancer. An otherwise healthy and active woman, Mrs. M wanted an autologous breast reconstruction, but was concerned about the extended recovery associated with the standard DIEP procedure. After a consultation with Dr. Kanchwala involving a consideration of her options, she consented to have a mi-DIEP procedure.

A week later, Mrs. M returned for the first step of the two-step procedure. At this time, bilateral mastectomies were performed and temporary spacers were placed, and the vessels surrounding two appropriate inferior epigastric perforators (previously identified by CT angiogram) were clipped. Mrs. M remained in the hospital overnight and importantly, was discharged the next morning needing only over-the-counter painkillers.

When Mrs. M returned two weeks later, a laparoscopic total extraperitoneal (TEP) approach was used to harvest the flap and its vascular pedicle. This allowed a 2 cm incision in the fascia and muscle, drastically minimizing the amount of dissection. The flaps were then transferred individually with their perforators to the site of the earlier placed expanders and anastomosed to the right and left internal mammary arteries, respectively.

Mrs. M remained in the hospital for 36 hours for flap monitoring. Again, her pain was well controlled on over-the-counter medications. She was able to return to normal activities three weeks after surgery.

FACULTY TEAM

Penn Plastic Surgeons are recognized for their dedication to research and clinical care and for their collaboration with multidisciplinary teams and internationally-known specialists to provide patients with the highest quality complex care. Penn Plastic Surgery is the nation's leader and among the world's largest centers in clinical volume in reconstructive microsurgery (recently performing their 5,000th free flap reconstructive surgery).¹ Penn plastic surgeons recently took part in the first Bilateral Robotic Assisted DIEP flap procedure in the nation.

► Performing mi-DIEP with Surgical Delay at Penn Medicine

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