



FORD PLASTIC & RECONSTRUCTIVE SURGERY

BREAST RECONSTRUCTION OPTIONS

What options are available for breast reconstruction?

If you have decided to have breast reconstruction, you'll still have many things to think about as you and your doctors talk about what type of reconstruction might be best for you. There are many different reconstruction techniques available. Take the time to learn about the breast reconstruction options and consider talking to others who have had that procedure before you make a final decision.

Breast reconstruction with implants

Implant-based breast reconstruction may be possible if the mastectomy or radiation therapy have left sufficient tissue on the chest wall to cover and support a breast implant. For patients with insufficient tissue on the chest wall, or for those who do not desire implants, breast reconstruction will require a flap technique (also known as autologous reconstruction). The most common method of tissue reconstruction uses lower abdominal skin and fat to create a breast shape. There are several techniques that can be used for implant-based breast reconstruction. Make sure to discuss with your plastic surgeon which is appropriate for you.

Immediate breast reconstruction above the pectoral muscle

This procedure is performed in combination with the mastectomy and results in an immediate breast mound. After the mastectomy has been performed by the breast surgeon, the plastic surgeon will place the breast implant, wrapped in a biological mesh known as acellular dermal matrix (ADM), to help the implant maintain correct anatomic position, above the pectoralis muscle. With this procedure, recuperation may be more rapid because the muscle in the chest has not been elevated. Further, the breast implant itself is not influenced by the contraction of the muscle. Complications, while rare, may include skin loss, excess bleeding, infection, malposition of the implant so that asymmetry occurs, wrinkling or rippling of the implant, possible fluid collection underneath the implant and/or unfavorable scarring. This procedure may also require secondary autologous fat transfer to eliminate upper pole wrinkling and rippling over time, which will occur over secondary procedures.

Immediate breast reconstruction under the pectoral muscle

This procedure is also performed in combination with the mastectomy and results in an immediate breast mound. The incision generally is performed through the mastectomy site. Once the mastectomy is completed, the plastic surgeon will elevate the pectoralis major muscle. This will allow the muscle to retract upward and allow a pocket to be developed underneath the muscle and at the bottom of the normal breast position. A biodegradable acellular dermal matrix (ADM) will be placed at the bottom of the breast or inframammary crease and attached to the muscle. The breast implant will be placed under the ADM and your own muscle. This allows the breast implant to settle in a normal position, and the ADM stretches into a pleasing, rounded lower breast shape. It is not uncommon to have drains placed with this procedure. They may be removed



anywhere from 48 hours to 2 weeks after surgery. This procedure is a one-staged procedure, which allows the desired shape to result without any further surgical intervention. The muscle on top of the implant will help prevent the development of upper pole wrinkling. Complications, while rare, may include skin loss, excess bleeding, infection, malposition of the breast implant so that asymmetry occurs, wrinkling or rippling of the implant, possible fluid collection underneath the implant and/or prosthesis deflation.

Delayed breast reconstruction utilizing tissue expander

The initial portion of this procedure entails the breast surgeon performing a standard mastectomy and possible axillary dissection. In many instances, a drain will be placed between the muscle and the skin of the mastectomy. Once these procedures have been performed, the plastic surgeon will divide the lower pole of the chest wall muscle, elevate the chest wall muscle and the lateral chest muscle together upwards towards the collarbone. After that is done, the muscle and tissue below is elevated together to form the pocket for the breast expander at the base of the breast or the inframammary crease. The pocket is made large enough for the expander to be placed and the muscle closed. Occasionally, there is a need for placement of a small amount of acellular dermal matrix (ADM) to assist in the closure of the muscle. There are two types of breast tissue expander ports. One is similar to a chemotherapy port, is placed separate from the tissue expander, usually along the rib cage. This will require a separate small incision for the port. The second type is a port that is contained within the expander itself. In both instances, the ports will be used to initiate the tissue expander over several visits with saline solution. The port is accessed with a small needle and saline is injected into the expander through the port site. Tissue expansion usually occurs weekly according to patient tolerance. The volume of the tissue expanders commonly exceeds the weight of the mastectomy tissue. Once the final tissue expansion, or stretching, is completed there will be a time of passive expansion where little to no volume is added to the tissue expanders. This allows the muscle and skin to stretch and relax. The length of time will vary from patient to patient. Once this is completed, a second outpatient procedure will be necessary to remove the tissue expander and place the permanent breast prosthesis. Complications, while rare, may include skin loss, exposure of the expander, excess bleeding, infection, malposition of the implant so that asymmetry occurs, wrinkling or rippling of the implant, possible fluid collection underneath the implant, pain at the injection site, muscle spasms with expansion and/or unfavorable scarring.

Immediate breast tissue expander placement

The surgical process for saline breast tissue expanders and breast expanders following mastectomy are the same. Expanders with saline have been used for decades but recently, a new type of expander using air, which allows for more patient control, have been introduced. Expanders have some of the same complication rates and risks as the other types of breast reconstruction, which include infection, seroma, hematoma, extrusion and/or expander deflation. The expander is placed into a submuscular or subcutaneous space with no external filling ability. The expander will fill with compressed air contained within the expander itself. The patient may do self-controlled expander fills utilizing an external automatic activation device at home and will achieve similar results to the standard saline filled tissue expansion devices. It will be necessary to monitor the incisions and progress on your own and contact the physician if you feel there is something wrong. The advantage of the expander is that it may decrease doctor visits and decrease total expansion time.



Immediate breast reconstruction utilizing latissimus dorsi muscle

This procedure is performed as a secondary operation immediately during the mastectomy or delayed after radiation. The latissimus muscle is a very large vascular muscle in the back that is attached at the base of the arm, extends onto the chest from the arm past the shoulder blade and attaches close to the spinal column. The latissimus muscle stretches to the hip bone and laterally into the axilla or armpit area and is supplied mostly by artery in the axilla. The latissimus flap is frequently used when the amount of soft tissue is limited secondary to surgery, the pectoralis muscle is absent, partially removed or damaged secondary to radiation. It entails undermining the skin on the back and releasing some of the skin allowing it to remain attached to the muscle. The main muscle and artery are called pedicle flap. This flap is released from the back, passed through a tunnel that is made underneath the axilla and into the anterior chest to fill the mastectomy defect site. The muscle is placed and sutured to the chest wall. An implant is then placed behind this flap and in front of the chest. One can also use a tissue expander and gradually increase to breast size. The advantage to this expander is it can completely replace the amount of breast tissue that has been removed and protect the latissimus flap. A completely inflated implant or a postoperative adjustable expander/implant can be immediately placed. It is not uncommon to require a secondary revision procedure to gain more accurate symmetry of both breasts. The latissimus flap is recommended for patients who have already had mastectomy and radiation. The use of radiation frequently limits the amount of implant surgery that can be performed. The secondary advantage of this flap is that it brings new blood flow and healthy skin to the radiated field. It is also recommended for patients who are very thin and have limited options for flap reconstruction. Complications, while rare, may include limited blood flow of the artery compromising the flap, skin loss, exposure of the expander, excess bleeding, infection, malposition of the implant so that asymmetry occurs, wrinkling or rippling of the implant, possible fluid collection underneath the implant, pain at the injection site, muscle spasms with expansion and/or unfavorable scarring.

Breast reconstruction with abdominal-based flaps

Sometimes a mastectomy or radiation therapy will leave insufficient tissue on the chest wall to cover and support a breast implant. In these cases, breast reconstruction usually requires a flap technique (also known as autologous reconstruction). This is the most common method of tissue reconstruction, using lower abdominal skin and fat to create a breast shape. A woman may also choose not to have an implant for personal reasons. The skin and fat used for this procedure is the tissue between your belly button and pubic bone that you can pinch. Once this tissue is taken to make a breast, you will typically have a scar from hip bone to hip bone and around your belly button. However, some women may not be candidates for abdominal-based flaps for various reasons: Not enough donor tissue in the lower abdomen Prior scars that may have damaged important blood vessels Previous flaps that have failed and seeking an alternative

Specific flap options:

Several different flaps use the tissue from the lower abdomen. The difference between each of them is related to blood vessels that supply these flaps. These flaps include the Pedicled TRAM (transverse rectus myocutaneous) flap, the free TRAM flap, the DIEP (deep inferior epigastric artery perforator) flap and the SIEA (superficial epigastric artery) flap.



Pedicled TRAM flap

A TRAM flap uses the muscle, fat and skin from your lower abdomen to reconstruct a breast. In order to survive on your chest in its new location, this tissue requires a blood supply. The blood supply to this tissue comes from the underlying rectus (six-pack) muscle. The flap remains attached to your rectus abdominis muscle and is tunneled up through the abdomen and chest to create the breast mound. Since your entire muscle is sacrificed, you may experience some abdominal weakness or have difficulty performing sit-ups.

Free TRAM flap

Like the TRAM flap, the free TRAM flap is also based on the blood vessels coming through the rectus abdominis muscle. However, in this flap the muscle above and below the blood vessels is divided, so that only a portion of muscle is removed. The entire flap is then transplanted to the chest. The blood vessels from the muscle are connected to blood vessels in the chest using a microscope.

DIEP flap

The DIEP flap utilizes the same lower abdominal skin and fat as the TRAM and free TRAM flap; however, it spares the rectus abdominis muscle and fascia. Rather than taking the entire muscle or a small portion of the muscle, the small blood vessels – an artery and a vein – that come through the muscle to the skin and fat are identified; these vessels are then dissected through the muscle prior to being divided. Once they are divided, the tissue is again transplanted to the chest and the vessels are connected to blood vessels in the chest. Since your muscle is preserved, there is a lower risk of abdominal weakness or hernias and less postoperative pain.

SIEA flap

The SIEA flap also uses the lower abdominal skin and tissue, but the blood vessels that supply this flap do not go through the abdominal muscle. Rather, they only go through the fat. Advantages of this flap include preservation of the abdominal muscles, resulting in less postoperative pain and a speedier recovery. However, these blood vessels may not be present in all women; and even when present, may be too small to provide a reliable blood supply for a flap. For these reasons, the SIEA flap is not performed as frequently as the DIEP or free TRAM flaps.

Special notes regarding recovery

Because the free TRAM, DIEP and SIEA flaps involve microsurgical tissue transfer, blood flow to the flap is closely monitored in a hospital setting after surgery. If there are concerns about the flap, a reoperation may be necessary to assess the blood flow.

Breast reconstruction with thigh-based flaps

Sometimes a mastectomy or radiation therapy will leave insufficient tissue on the chest wall to cover and support a breast implant. In these cases, breast reconstruction usually requires a flap technique (also known as autologous reconstruction). Thigh-based flaps may be a good option for women with small to medium



volume breasts. To achieve a larger size, these flaps may be combined with an implant or another flap (called "stacked flaps," which are not widely available). All of these techniques require your plastic surgeon to have skill and training in microsurgery. However, some women may not be candidates for thigh-based flaps for various reasons: Not enough donor tissue in the upper thighs, prior scars that may have damaged important blood vessels. Or previous flaps have failed and they are seeking an alternative.

Gracilis Flap

Gracilis based flaps are based on the gracilis muscle, located in the upper inner thigh. The gracilis muscle helps bring the leg toward the body, and its function will be lost after this type of surgery. During these procedures, a flap of skin, fat, muscle and blood vessels from the upper thigh is moved to the chest to rebuild the breast. Blood vessels are carefully reattached using microsurgery. Different names are used to describe the orientation of the resulting donor site incision on the upper inner thigh:

TUG flap: Transverse Upper Gracilis flap

VUG flap: Vertical Upper Gracilis flap

DUG flap: Diagonal Upper Gracilis flap

The choice of incision depends on your unique thigh shape and your surgeon's experience. Most surgeons will try to conceal the scars in the crease at the top of the thigh, but the scar may end up a bit lower and be visible while wearing a bathing suit. These flaps result in a tighter inner thigh, similar to an inner thigh lift.

Pap Flap

Similar to the gracilis-based flaps, a PAP flap uses skin and fat from the back of the upper thigh to reconstruct the breast using microsurgery. PAP stands for Profunda Artery Perforator, which is a blood vessel that supplies this area of the thigh. No muscle is used, so a PAP flap is considered muscle-sparing. PAP flap scars are usually hidden in the crease between the lower buttock and upper thigh.

Special notes regarding recovery

Because these flaps involve microsurgical tissue transfer, blood flow to the flap is closely monitored in a hospital setting after surgery. If there are concerns about the flap, a reoperation may be necessary to assess the blood flow. Thigh-based flaps do tend to have more healing problems at the donor site than abdominal-based flaps due to the location of the incision. Lower leg swelling may occur but usually resolves with time. When one thigh-based flap is used to reconstruct one breast, asymmetry may result due to tightness and thinness of one thigh. Additional procedures may be recommended to improve symmetry between the thighs.

Breast reconstruction with gluteal-based flaps

Sometimes a mastectomy or radiation therapy will leave insufficient tissue on the chest wall to cover and support a breast implant. In these cases, breast reconstruction usually requires a flap technique (also known as autologous reconstruction). A woman may choose not to have an implant for personal reasons. Gluteal-based flaps may be a good option for women with small to medium volume breasts. To achieve a larger size,



these flaps may be combined with an implant or another flap (called "stacked flaps," which are not widely available). All of these techniques require your plastic surgeon to have skill and training in microsurgery. However, some women may not be candidates for gluteal-based flaps for various reasons: Not enough donor tissue in the gluteal region Prior scars that may have damaged important blood vessels Previous flaps have failed and they are seeking an alternative

Specific flap options

Gluteal-based flaps use skin and fat from the buttocks. SGAP flap stands for Superior Gluteal Artery Perforator, which is located in the upper buttock. During this procedure, a flap of skin, fat and blood vessels is moved to the chest to rebuild the breast. Blood vessels are carefully reattached using microsurgery. Because no muscle is used, an SGAP flap is considered a muscle-sparing flap. Similarly, the IGAP flap, or Inferior Gluteal Artery Perforator flap, uses tissue near the bottom of the buttocks near the crease. The IGAP is less favorable because the incision ends up near the weightbearing region during sitting. The choice of incision depends on your unique buttock shape and your surgeon's experience. Most surgeons will try to conceal the scars at the top of the buttocks, which usually result in a tightening effect.

Special notes regarding recovery

Because these flaps involve microsurgical tissue transfer, blood flow to the flap is closely monitored in a hospital setting after surgery. If there are concerns about the flap, a reoperation may be necessary to assess the blood flow. GAP flap procedures tend to be technically more difficult than other types of autologous reconstruction. Also, the density of tissue from the buttocks may be harder to shape into a natural breast when compared to tissue from the lower abdomen or inner thighs. If one GAP flap is used to reconstruct one breast, asymmetry may result between the buttocks. Additional procedures such as liposuction to the other side may be recommended.