

TRAM (Transverse Rectus Abdominis Myocutaneous) Flap

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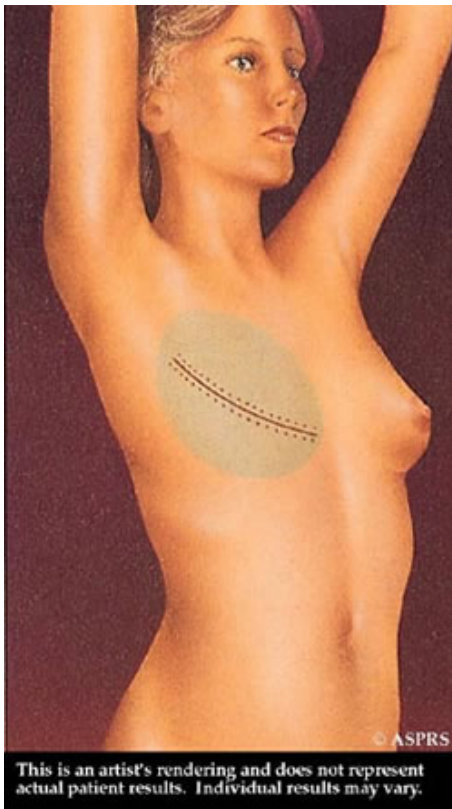
Currently, the TRAM flap is the most common form of living tissue reconstruction. [Click here to see a detailed graphical version of the TRAM flap.](#)

How is the procedure performed?

In general, there are two main types of TRAM flap procedures: the pedicled flap procedure and the free flap procedure. In each case, a portion of skin, fat and muscle is removed from the lower abdomen and transferred to the mastectomy site. These tissues are then used to construct a new breast.

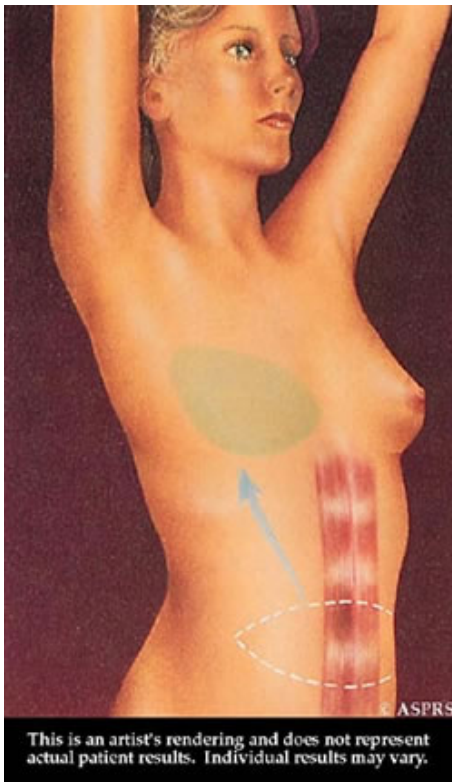
The tissue taken from the abdomen during a TRAM flap procedure is very similar to the tissue removed during a "tummy tuck". See [Figures 2, 3, 4](#) and [5](#) for schematics of the TRAM flap procedure.

Figure 2 - This schematic demonstrates a typical mastectomy scar.



This is an artist's rendering and does not represent actual patient results. Individual results may vary.

Figure 3 - This schematic demonstrates how the TRAM flap is moved from the abdominal area to the mastectomy site.



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Figure 4 - This schematic demonstrates a left TRAM flap used in the reconstruction of a right mastectomy defect.

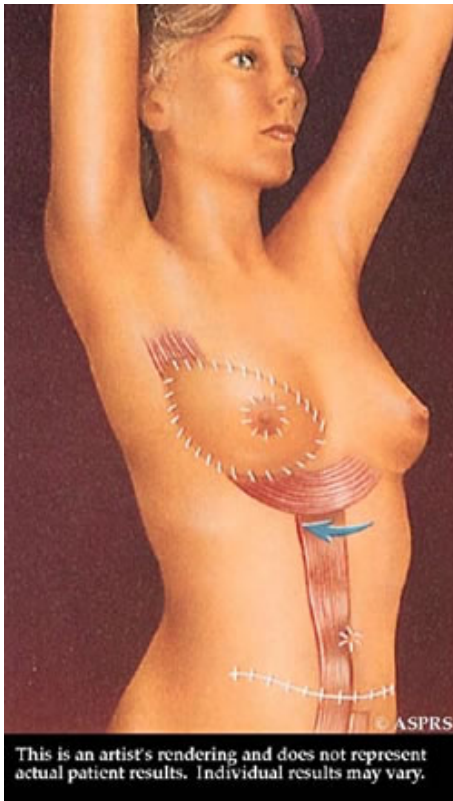


Figure 5 - This schematic demonstrates an idealized final TRAM flap result



In general, the TRAM flap procedure can be either pedicled (i.e. remains attached to its blood supply) or free (i.e. detached from its original blood supply and reattached to a blood supply at a distant location). A more detailed discussion of these procedures is presented below.

Scars

There are two scars associated with this procedure, one on the breast and one on the abdomen. On the breast, most times the old mastectomy scar is excised and some of the abdominal skin from the TRAM flap is used to fill in the resultant defect. Therefore, the scar on the breast becomes an elliptical shape. The scar on the abdomen is the same as that used for a "tummy tuck". It is a horizontal line, running from hip to hip, along the patient's "panty line". There will also be a scar located circumferentially around the umbilicus (i.e. "belly button") (see Figure 5).

Blood Supply of the TRAM flap

The TRAM flap is supplied by the epigastric system of blood vessels. The superior epigastric vessels enter the flap from its superior aspect, while the deep inferior epigastric vessels enter from its inferior aspect. The dominant blood supply of the TRAM flap is from the deep inferior epigastric system. The pedicled TRAM flap gets its blood supply from the superior epigastric vessels, whereas the free TRAM flap gets its blood supply from the deep inferior epigastric vessels (see [Figure 6](#)).

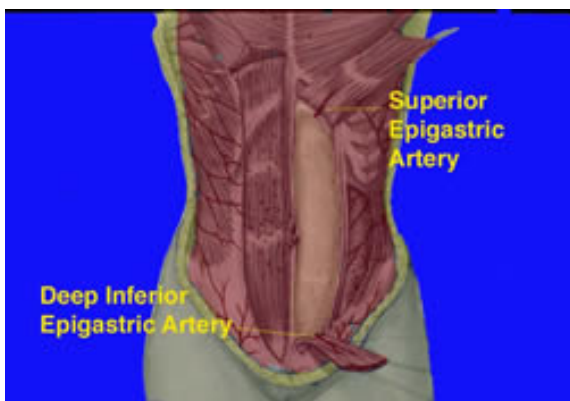


Figure 6 - This schematic shows the left rectus muscle divided in two to demonstrate the blood supply of the TRAM flap.

Both the superior and inferior epigastric vessels pass through the substance of the rectus abdominis muscle and send feeding branches through the muscle (i.e. perforators) to supply the overlying fat and skin (see [Figure 7](#)).

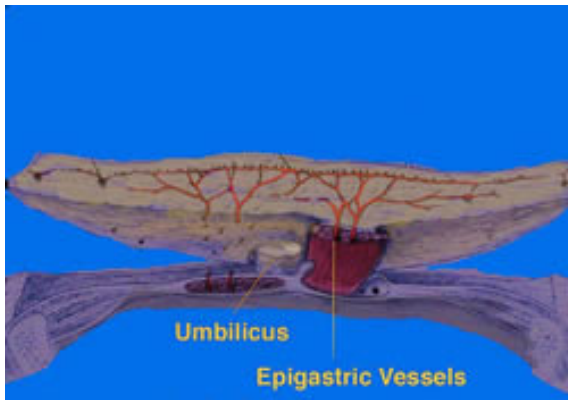


Figure 7 - This schematic shows the left rectus muscle and its perforating vessels, which give the TRAM flap its blood supply

Advantages of the TRAM Flap

- the reconstructed breast is made of natural tissue
- there is no exposure to synthetic materials (i.e. breast implants)
- the patient gets a "tummy tuck" in the process

Disadvantages of the TRAM Flap

- it is a large surgical procedure
- there is a potential for decreased abdominal strength afterward
- the procedure leaves additional abdominal scars

Indications for TRAM Flap Reconstructions

In general, the patients that are best suited for this procedure are in good health and prefer to either use their own tissue for the reconstruction or are wishing to avoid the use of breast implants.

A TRAM flap can be used to reconstruct a breast after:

- an operation for breast cancer (i.e. a mastectomy)
- alternate methods of breast reconstruction have failed
- some other types of breast or chest wall deformities

Contraindications for TRAM Flap Reconstructions

General Contraindications

Contraindications to the TRAM procedure include some of the common contraindications for any elective surgical operation. These include:

- severe chronic pulmonary disease
- severe cardiovascular disease
- uncontrolled hypertension
- morbid obesity
- severe and uncontrolled insulin-dependent diabetes

Specific Contraindications

- inadequate excess abdominal tissue
- certain abdominal incisions from previous surgical operations may have inadvertently caused a disruption in the necessary blood supply to the TRAM flap
- patients who smoke may be unable to have a pedicled TRAM procedure due to the effects of smoking on the blood vessels

Patients who smoke or who have unfavourable abdominal incisions from previous operations may still be candidates for a "free flap" procedure.

Possible Risks/Complications of a TRAM Flap

The TRAM flap reconstruction involves complex surgery. Like any other surgical procedure, there is the potential for complications. Some of the complications that could occur are listed below:

Breast Site Complications

The most common "complication" is an asymmetry of the new breast with the patient's natural breast. Sometimes this is purposeful as the patient may be planning to have a reduction in size on the natural side. Nonetheless, occasionally an additional procedure may be required after things have healed in order to better match the natural side.

Firmness of an area of fatty tissue in the new breast area may represent fat necrosis (i.e. "death" of the fat in the area). This may either be left alone or it can be surgically removed.

Partial flap loss (i.e. necrosis) occasionally occurs when the blood supply to the TRAM flap is inadequate. Flap necrosis may result in the loss of a portion (usually small) of the flap. Most times, this can be managed with dressing changes. Rarely, patients may need further surgery to repair the area of the lost flap.

Complete loss of the TRAM flap occurs due to an inadequate blood supply to the flap. Although still possible, this rarely occurs in the pedicled procedure. With the free TRAM flap, complete loss occurs somewhat more frequently.

Abdominal Complications

The abdominal area from where the TRAM flap was removed can be weaker than the surrounding tissues. This can result in a hernia (i.e. an area of weakness and bulging at the abdominal repair site). There will be a resulting weakness in abdominal muscle function, although most patients will be able to maintain their usual daily routines and physical activities as before. However, patients usually will find that their ability to do "sit-ups" is limited.

Complications that can occur at either area

Some women experience delayed wound healing in the breast or the abdominal area. Most times, this will heal on its own. Occasionally, patients may require repeated dressing changes over the course of a few weeks.

Fluid may collect under the new breast or more commonly under the abdominal area. These collections (i.e. seromas) may go away without any other procedures. Sometimes, the surgeon may have to remove the fluid with a syringe or a drain may need to be placed through the old incision and into the collection.

Infection, a rare complication, occurs more frequently in smokers, women who have had radiation, women who are diabetic, or women who are overweight. This is treated with the use of either oral or intravenous antibiotics, depending on the severity of the infection. Rarely, patients may need to have a surgical procedure to drain the infected area.

Most bleeding is easily stopped during the procedure. However, very rarely, excessive bleeding can occur during the procedure. If not too severe, the patient will need no further treatment. If severe, the patient could need a blood transfusion.

Recovery Time

Initially, the patient may feel pain or discomfort in either the breast or abdominal site. This is usually treated adequately with analgesics. In addition, arm motion may be limited and abduction (i.e. outward motion) is discouraged. The patient is encouraged to begin some active arm exercises 2 to 3 weeks postoperatively. Abdominal exercise should be limited for approximately 2 months. As a general rule, it usually takes 2 to 3 weeks for patients to return to routine daily activities and 6 to 8 weeks for a full recovery.

For the following sections, please click [here](#).

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