

Implant Reconstruction

Contents

- [Introduction](#)
- [How is the procedure performed?](#)
 - [General Overview](#)
 - [Tissue Expanders](#)
 - [Replacement With a Permanent Implant](#)
 - [Expandable Breast Implants](#)
 - [Detailed Surgical Technique](#)
- [Scars](#)
- [Advantages](#)
- [Disadvantages](#)
- [Indications](#)
- [Contraindications](#)
- [Possible Risks/Complications](#)
- [Saline Versus Silicone Implants](#)
- [Expected Recovery Time](#)
- [Patient Examples of Implant Reconstructions](#)

Introduction

Prior to the advent of living tissue breast reconstruction, the most commonly performed breast reconstruction involved the use of breast implants to replace the lost breast. This technique remains as an important option that must be discussed during any reconstructive breast surgery consultation.

How is the procedure performed?

General Overview

The replacement of mammary tissue with an implant has been refined over the years and currently almost always implies the use of tissue expansion prior to the placement of a permanent implant. Nonetheless, there are situations in which tissue expansion may not be a necessary part of the treatment. Most commonly, this is during an immediate reconstruction in a patient undergoing a skin-sparing mastectomy. In this case, there is often a sufficient skin envelope remaining, which facilitates the reconstruction of a new natural appearing breast. Tissue expansion may also be avoided in patients who require reconstruction of a small non-ptotic (i.e. non-droopy) breast.

Typically, a mastectomy normally removes a variable amount of breast skin surrounding the nipple. The amount of skin removed depends on tumour size and also the location of the biopsy scar. When significant breast skin has been excised with the mastectomy, a natural appearing form cannot be achieved without the use of tissue expanders, which slowly expand the remaining breast skin. In addition, the skin circulation and its healing ability may be somewhat compromised

by the mastectomy. In combination, these factors prevent the immediate placement of a permanent implant at the time of mastectomy in most patients. Therefore, the implant reconstruction becomes a staged process, which includes the initial use of tissue expansion.

Tissue Expanders

Tissue expansion is a process that stretches the remaining skin in preparation for the placement of a permanent implant later. Depending on whether one is dealing with an immediate or a delayed reconstruction, the tissue expander is either placed at the time of the mastectomy or during a subsequent procedure. Decisions regarding the type and location of the tissue expander will depend on surgeon preference as well as on the characteristics of the breast to be reconstructed.

A tissue expander is like an inflatable breast implant that is inserted into a pocket under the skin and muscle of the chest (see [Figures 1](#) and [2](#)). The expander is usually placed in its collapsed form at the time of mastectomy and then beginning about two weeks after surgery, fluid is introduced into the tissue expander to slowly inflate it (see [Figures 3](#), [4](#) and [5](#)). Depending on the type of expander, the fluid is either introduced directly into the expander or it is injected into a distant port. This process continues for several weeks until the tissue expander is filled to an optimal volume. Six to twelve weeks are then allowed for the skin to stabilize and loosen around the expander. The patient is then brought back to the operating room to remove the tissue expander and insert a permanent breast implant.

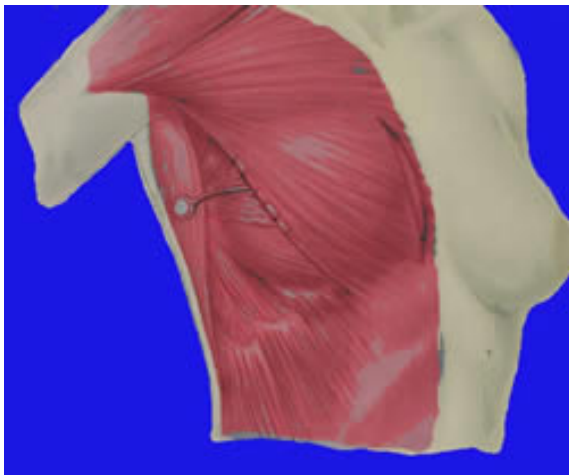


Figure 1 - This is a schematic showing the position of the tissue expander under the pectoralis major muscle.



Figure 2 - This is an intraoperative view of the tissue expander placed underneath the pectoralis major muscle.

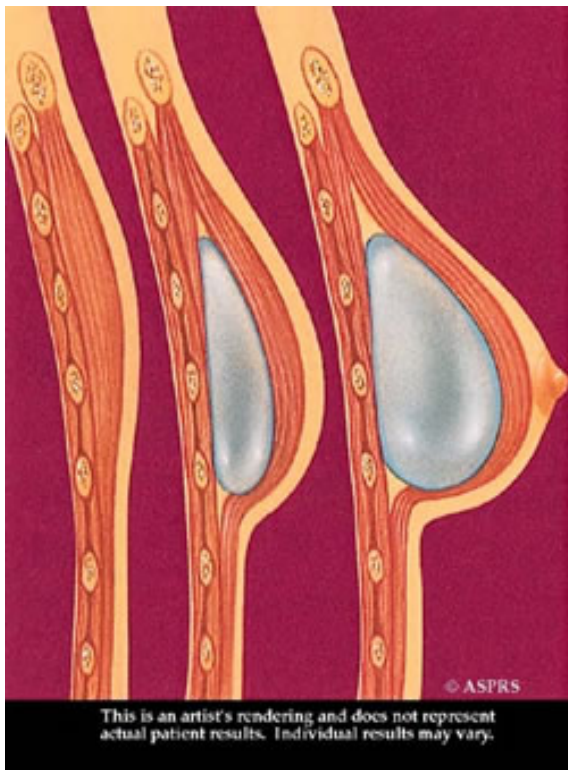


Figure 3 - This schematic demonstrates the position of the tissue expander and shows three stages in its expansion. The permanent breast implant will be inserted in a similar location.



Figure 4 - This short video schematically demonstrates how the tissue expansion process works. (Quicktime movie - click on graphic to launch in new browser window)

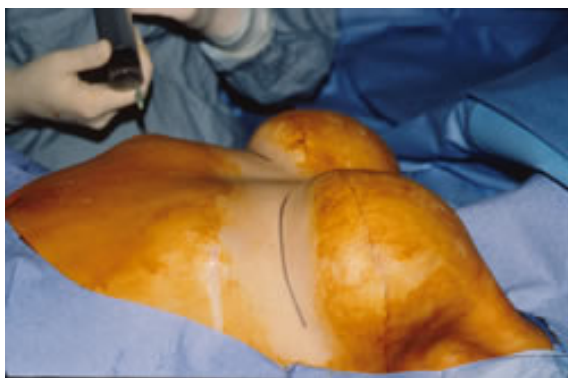


Figure 5 - This is an intraoperative view of the tissue expanders being inflated.

There are different types of tissue expanders. See [Figure 6](#) for a picture of some of the types of tissue expanders. Decisions have to be made with regard to the choice of a textured or a smooth expander, as well as the choice between an integrated and a remote port. In general, textured expanders may cause less capsular reaction and contraction (i.e. scarring and hardening of the breast) than their smooth counterparts. Furthermore, textured implants tend not to migrate and remain in the location that they were placed, as opposed to smooth implants that can migrate within the pocket. However, textured implants are more expensive and require greater precision in terms of accurate positioning at the time of insertion.



Figure 6 - There are numerous shapes and sizes of tissue expanders. The large round one is the most commonly used for breast reconstruction.

Integrated ports require less tissue dissection when they are placed, when compared to expanders with remote expansion ports. The expanders with remote ports usually require the creation of a small "tunnel" to bring the port out of the skin at a distant location (usually in the armpit). The remote port can be easier to inject, but patients may occasionally complain of discomfort from having the port tunnelled to the armpit. On the other hand, although the integrated port does not require tunnelling, the subsequent injections of fluid need to be inserted through the breast skin and into the expander. Although the skin may be somewhat numb, this can be painful.

Replacement With a Permanent Implant

A permanent breast implant replaces the tissue expander once expansion is complete. Several decisions again need to be made with regard to the permanent implant. First (and similar to the tissue expander), a choice between smooth and textured implants needs to be made. The advantages and disadvantages are identical to those of the tissue expander described above. Next, a choice between saline and silicone implants must be made. See below for the advantages and disadvantages between the two. Finally, the size and shape of the implant must be decided. Most commonly, the size of the implant is chosen to best match the opposite breast. However, in the case of a bilateral mastectomy (i.e. both breasts), the patient and surgeon will discuss and decide on the desired size of the implants. Two basic types of implant shapes are available. These are either anatomic or round. The round implant is what has traditionally been used and it continues to be used by many surgeons with excellent results. The anatomic implant has a contour that more closely resembles the natural shape of the breast. Therefore, it may give a more natural shape to the reconstructed breast. However, the anatomic implants are more difficult to insert, are more likely to migrate and rotate, are more expensive, and the argument that a better breast shape is achieved is debatable. See [Figures 7](#) and [8](#) for a schematic of an idealized final result.

Figure 7 - This schematic demonstrates a typical mastectomy scar.

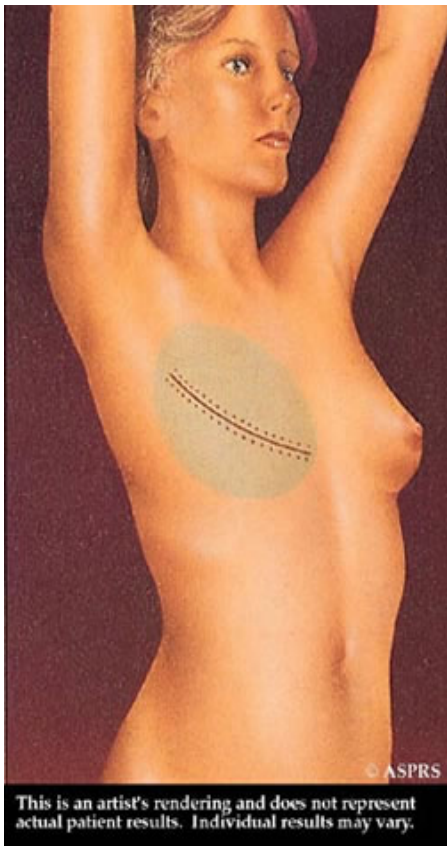
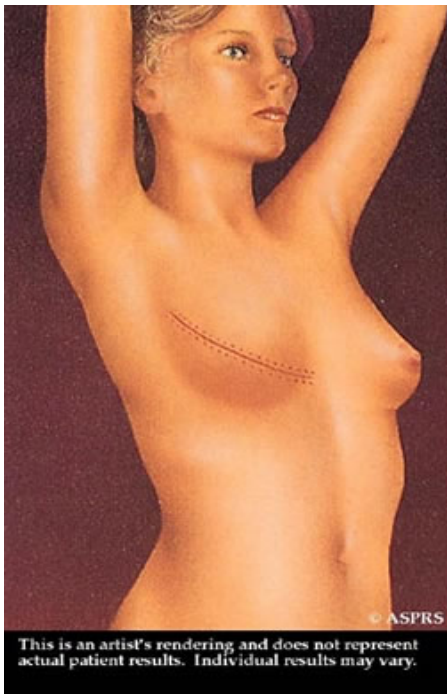


Figure 8 - This is a schematic of the final result.



Expandable Breast Implants

It should be noted that there is one other option for breast implant reconstruction. Recently, a new expandable breast implant has been developed and approved for use in breast reconstruction. This implant is very similar to a tissue expander with an integrated port, as it is inserted in the same fashion and is then expanded slowly over the course of several weeks (see [Figure 9](#)).

However, the advantage of this device is the fact that after the implant is expanded to the desired size, it remains as a permanent breast implant. Therefore, the implant reconstruction becomes closer to a one-staged procedure, as the expander does not have to be replaced with a permanent implant. The injection port is removed through a minor secondary procedure. The main disadvantage is the increased cost of the device.



Figure 9 - This short video schematically demonstrates how an expandable breast implant works. (Quicktime movie - click on graphic to launch in new browser window)

Detailed Surgical Technique

For immediate reconstructions, the expander is simply placed through the mastectomy incision and into either the subcutaneous or the submuscular plane. Usually, tissue expanders are placed in a submuscular position. When placing implants in the submuscular position, the pectoralis major muscle is split along the lines of its fibers until the sub-pectoral plane is reached. Blunt dissection then facilitates the development of a sub-pectoral pocket into which the expander can be placed. Once the expander is in place, the split in the muscle is repaired. This repair can cause an undesirable superior displacement of the expander. For this reason, some surgeons will place the expander through the inferolateral aspect of the muscle, leaving the lower lateral segment of the expander in the subcutaneous plane, while the rest of the expander remains submuscular.

For delayed reconstructions, the incision is placed within the original mastectomy scar. Because there is a pre-existing scar, the surgeon can have the luxury of easy access if the full length of the scar is re-opened. The dissection and placement of the expander is then similar to that described above. In addition, if necessary, the original mastectomy scar can be revised at this time in an effort to achieve a better appearing scar.

Scars

Most times, the mastectomy site is used for the insertion of the implant and/or the tissue expander. Therefore, there are no additional scars.

Advantages of Implant Reconstructions

When compared to living tissue reconstructions, implant reconstructions have the following advantages:

- shorter operative procedure
- shorter hospital stay
- shorter recovery time
- produces relatively predictable breast shapes in most women
- leaves fewer scars (i.e. no new scars on other areas of the body)
- does not involve the movement of any muscle from the abdomen or back

Disadvantages of Implant Reconstructions

When compared to living tissue reconstructions, implant reconstructions have the following disadvantages:

- may give a less natural breast shape
- the expansion process is time consuming and may be inconvenient
- the final breast shape is not immediate
- after radiation therapy, the skin may not respond well to the expansion process
- an implant reconstruction may not respond well to subsequent radiation therapy
- the process is a staged procedure (i.e. more than one operation)
- the expanders and implants may migrate
- the expanders and implants may rupture
- a capsular contracture (i.e. scarring and hardening of the breast) may occur which requires additional surgery to correct (see [Figure 10](#))
- "wrinkling" or "rippling" of the implants may occur (see [Figure 11](#))



Figure 10 - This short video schematically demonstrates what a capsular contracture of a breast implant is. (Quicktime movie - click on graphic to launch in new browser window)



Figure 11 - This short video schematically demonstrates what "wrinkling" or "rippling" of a breast implant is. (Quicktime movie - click on graphic to launch in new browser window)

Indications for Implant Reconstructions

Most patients who decide to have their breast reconstructed should be presented with the option of either an implant reconstruction or a reconstruction with their own living tissue. However, in general, patients with smaller, minimally ptotic breasts who have undergone a total mastectomy are the best candidates for an implant reconstruction. Also, some patients may not have the excess tissue required for certain reconstructive breast procedures. For example, a very thin woman may not have enough excess abdominal tissue for a TRAM flap procedure.

Contraindications for Implant Reconstructions

Patients who do not have adequate soft tissue or skin after their mastectomy may not be candidates for tissue expander-implant reconstructions, as it may be impossible to cover the tissue expander. For example, patients after a radical mastectomy may be left with very thin skin flaps and an absent pectoralis major muscle. Often this requires the addition of tissue from elsewhere in the body to reconstruct the defect. Therefore, these patients are not ideal candidates for tissue expander-implant reconstructions. In general, any patients who have undergone extensive skin excisions with tight closures and thin flaps are may be better treated with flap reconstructions. Patients who have had or are scheduled to have chest wall radiation are not good candidates for tissue expander-implant reconstructions. It is also difficult to make a large, slightly ptotic (i.e. droopy) breast with reconstruction using implants only.

Possible Risks/Complications Associated With Breast Implants

The most common complication is leakage or rupture of the breast implant. This happens in approximately 10% of cases over the first 10 years. When this occurs, the implant should be removed and replaced.

The second most common complication is encapsulation or "capsule formation". Scar tissue forms on the outside of all artificial implants when placed in the body (See [Figure 10](#)). Usually, this does not pose a problem. However, in a minority of cases, too much scar tissue forms. The scar tissue may cause pain and discomfort and may make the implant feel hard to the touch. When this happens, surgery may be necessary to break up or remove the scar tissue. It may also be necessary to remove or replace the implant. Capsules can form at any time from a few weeks to

many years after the implants are inserted.

It is also possible that the implant might shift relative to the breast tissue sometime after the surgery. This may need further surgery to correct the position of the implant.

Lastly, "wrinkling" or "rippling" in the shape of the final reconstructed breast may occur (see [Figure 11](#)). This is particularly common with saline filled implants.

Other complications include infection, bleeding, and exposure of the implant. The reconstructive breast surgeon should discuss these issues with patients in detail at the time of their consultation appointment.

Saline Versus Silicone Implants

It is commonly held that silicone gel-filled implants have a more natural look and feel when compared to saline implants. The texture of silicone gel more closely resembles the natural breast tissue, while saline in a silicone pouch feels harder than natural breast tissue. In this respect, silicone gel-filled implants are felt to have an advantage over the less natural feeling saline implants. However, silicone gel-filled implants do have their disadvantages. For one, ruptures in silicone gel-filled implants are more difficult to detect. This allows time for the silicone to leak into the surrounding areas and tissues of the breast. Since leaked silicone gel may need to be removed at a later time, this process becomes more difficult. When saline leaks, the implant rupture is noticed almost right away. Also, the leaked saline is absorbed by the surrounding tissues and does not need to be removed surgically.

There have been some reports in the media of various health problems as a result of silicone gel implants. In these reports, silicone gel has been associated with lupus, rheumatoid arthritis, scleroderma, neurological disorders, and several other conditions. Following these reports, silicone gel-filled implants were removed from the market in North America to give scientists time to study the effects of silicone. Most research has since found no evidence supporting any connections between silicone breast implants and deleterious medical problems. Women who have silicone breast implants have been shown to have the same risk of these diseases as women who do not. Because of this information, silicone gel implants are beginning to be offered again by certain doctors. However, at this time, not all surgeons have access to silicone gel implants. Therefore, the vast majority of breast reconstruction is currently being done with saline-filled implants.

Expected Recovery Time

Most women will be able to resume many of their regular activities after one week. But it often takes three to four weeks before patients can perform more strenuous activities or return to work.

Patient Examples of Implant Reconstructions

[Example 1](#)

[Example 2](#)