

## Original Research Article

## Breast Reconstruction: Is It a Feasible and Acceptable Method?

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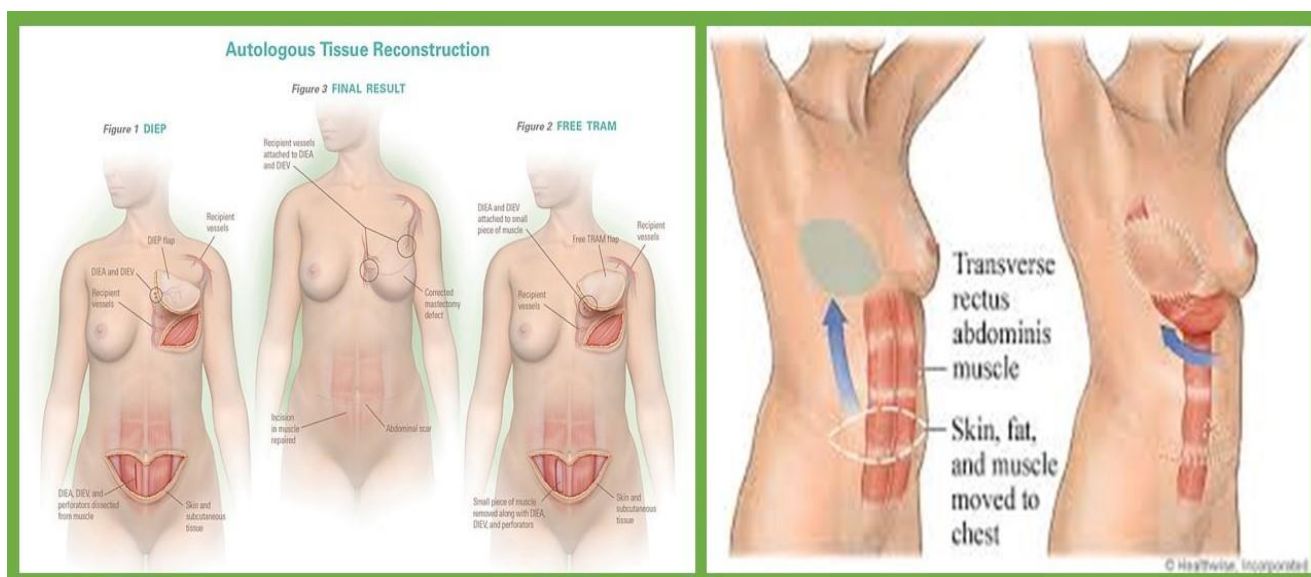
Breast Cancer

Surgery

## ABSTRACT

Breast cancer is a type of cancer that disrupts the function of cell division in breast cells. Breast cancer cells multiply uncontrollably and are more than necessary in an infected person. There are different types of breast cancer. Its type depends on which type of breast cells is affected. This cancer may start from different places in the breast. It is possible that a person is about to undergo a mastectomy or breast tissue removal surgery due to breast cancer or being prone to it, or has undergone this surgery in the past. In such a situation, the doctor will probably talk to the person about breast reconstruction options. Breast reconstruction is usually done during mastectomy or shortly after, although it can be done even years after mastectomy or lumpectomy. Repair is done in two different ways: autologous repair, in which a part of the tissue of person's own body is used to replace the breast tissue, and repair by means of artificial implants or a combination of both methods.

## GRAPHICAL ABSTRACT



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## Introduction

The most common types of breast cancer are these two types:

**1- Invasive breast milk duct cancer:** In this type of breast cancer, cancer cells form in the duct. After progressing, they gradually move out of it and find their way to other parts of the breast. These cells may even leave the breast and affect other areas of the body [1-3].

**2- Invasive lobular breast cancer:** In this type of cancer, cancer cells initially form in the lobule and then move to the other parts of the breast and beyond [4-6]. The first step in cancer treatment is surgery, the second step is chemotherapy, the third step is radiotherapy, and the fourth step is hormone therapy. Sometimes this order goes wrong, for example when the cancer is advanced; we have to do chemotherapy before surgery. It depends on the extent of cancer and its type, but if it has spread all over the body and is very advanced, not much can be done and chemotherapy may not even be recommended. In Tehran, we have these acute and horrible cases [7]. There are women who hide the problem. Some are old women who are not married and have nothing to do. The reaction that people show to the loss of breast tissue is unpredictable.

This reaction has nothing to do with a person's age, marital, or celibate status, and even whether a person is sexually active or not [8-10]. It is normal for a person to feel anxiety, sadness, or even mourning after a mastectomy because a part of the body has been lost [11]. A part that has a lot to do with femininity, a part of the body that makes a major part of a person's sexual identity, and a part of the body that makes clothes fit the body better [12].

## Reasons for breast reconstruction surgery

Women decide to undergo breast reconstruction surgery for the following reasons:

- ✓ More balance and proportion of the chest when wearing underwear.
- ✓ Permanent return of the breast form to its original and natural state.
- ✓ Not using external enlargers in underwear.
- ✓ Feeling better about body shape [13].

One thing that should be mentioned is that breast reconstruction is associated with scars, but fortunately these scars will fade over time [14-16]. Breast reconstruction after mastectomy helps the patient feel better about her and gain more self-confidence, but keep in mind that the breasts shape after surgery may be slightly different from the natural state (Figure 1).

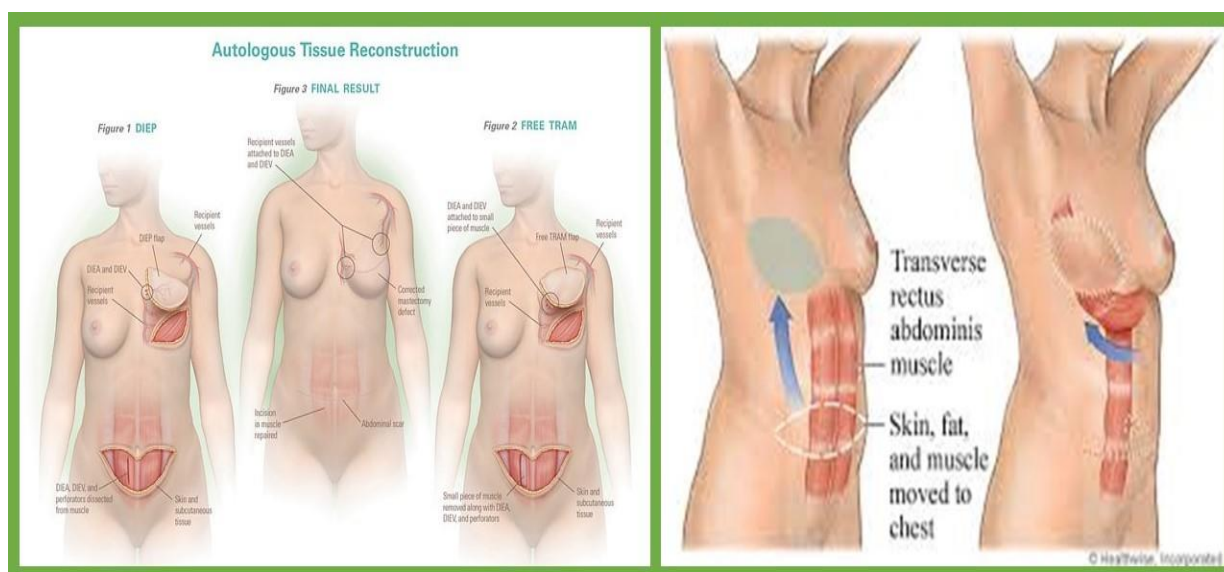


Figure 1. Breast reconstruction surgery

### **Important points about breast reconstruction**

- ✓ It is possible to reconstruct the breast immediately after the mastectomy surgery or sometime after the surgery.
- ✓ Not all breast reconstruction surgeries are successful.
- ✓ Breast tissue or flap does not survive after breast reconstruction. This dead tissue is called necrosis. In such a case, the repair process is delayed and usually more surgery will be needed to solve this problem [17].
- ✓ The process of surgical repair can be influenced by chemotherapy, radiotherapy, or previous surgery.
- ✓ In people who are smokers, it is decided to initially stop smoking for three months, and then decide to have surgery.
- ✓ Being aware of the surgical options helps the patient to have more reasonable and realistic expectations of the results [18].

### **Breast reconstruction after mastectomy**

Breast reconstruction is possible after mastectomy or breast removal. This surgery can be performed about two years after mastectomy and when other treatments such as chemotherapy and radiotherapy are finished and the patient is free from the disease [19].

### **The right time for breast reconstruction surgery**

This work can be done at the same time as breast removal surgery or after a period. In cases where breast removal surgery is performed to prevent breast cancer, it is better to perform breast reconstruction at the same time [20]. Sometimes, according to the breast surgeon's discretion, when a person has primary cancer, surgery to simultaneously remove and reconstruct the breast is recommended, but if the person needs chemotherapy and radiotherapy, it should be done until recovery [21]. Breast reconstruction surgery does not have an age limit and is not

specific to a particular stage of disease and will depend entirely on the patient's condition and doctor's discretion [22].

### **Breast reconstruction surgery options**

Breast reconstruction is a complex operation that is often performed in more than one stage. One of the main stages of this surgery will take a lot of time, and after this treatment stage, the person should be hospitalized and under care for two days, but the second stage of surgery can be performed in a shorter time and will not require hospitalization [23]. Reconstruction of a person's body tissue in different ways, such as excess fat in the lower abdomen, prosthesis, and in some cases, both methods are used. The choice of surgical method is determined according to the appearance of the person's body, age, request for re-pregnancy, breast shape, radiotherapy records, and concomitant diseases. Note that none of the treatment methods can be performed for each patient, and before surgery, consults the best breast surgeon in Tehran for reconstruction [24]. Have more than one consultation session with your doctor and record his words and listen carefully, and also make a decision with knowledge or trust in your doctor [25]. Women who have lost their breast for sometimes are so tormented by not having a breast that they will be very happy and satisfied with the average results of breast reconstruction, but some other people who simultaneously perform breast reconstruction surgery. If the person is not satisfied, the shock of losing the breast and the new breast shape will bring severe emotional damage to them. Therefore, it should be noted that the reconstructed breast will never be the same as the natural breast [26-28].

### **Breast reconstruction with prosthesis**

Using prosthesis is one of the options for breast reconstruction after cancer treatment. It is possible to perform this surgery simultaneously as mastectomy or after it [29-31]. Among the

advantages of reconstruction immediately after surgery, we can mention the preservation of breast tissue and more favorable results. In delayed reconstruction, a tissue expander is used during a mastectomy to prepare the breast tissue for surgery [32-34]. The expander is a balloon-like bag that is initially flat and gradually expands until it reaches the desired size. After stretching the skin on breast, a secondary surgery is performed to remove the expander and implant the prosthesis permanently [35-37]. Breast prosthesis is a method that does not have the natural sagging of the breast and does not fall outward when sleeping, and if there is enough skin, this method can be used. In cases of delayed reconstruction, the lack of skin should be compensated with an expander or fat injection, or combining grafting with prosthesis [38-40].

**Delayed reconstruction surgery is mainly performed in the following cases:**

- ❖ The person does not want to do surgery during cancer treatment.
- ❖ The patient has other medical conditions.
- ❖ Need to do radiotherapy [41-43].

**In this method, two types of prostheses are used:**

**1- Silicone prostheses and gel prostheses:** which are somewhat similar to natural breast tissue.

**2- Saline prostheses:** prostheses filled with sterile salt water [44].

**Breast reconstruction with the patient's own tissue**

Autologous tissue reconstruction or tissue flap is a procedure that aims to reshape the breast after surgery. In this method, tissue from other parts of the body, such as the abdomen, back, or thighs, is used. A tissue flap will have a more natural appearance than prosthesis, and this

reconstruction method is mainly done in two ways:

**A) TRAM flap:**

In TRAM flap surgery, a major part of tissue of the lower abdominal area, including skin, subcutaneous tissue, fat, and muscle fascia, along with the preservation of vascular perforators on the base of the upper epigastric artery with the attachment of corresponding rectus muscle, is separated in the form of a pedicled or free flap [45-47]. The areas of chest where there are tissue defects caused by mastectomy surgery are transferred. There are many different types of flap procedures [48-50]. They are often named by the muscle or artery used, and they mainly fall into two groups:

**A1) Pedicle flap:** A pedicle flap moves tissue from its site to the breast or chest wall, while still connected to its original blood supply. The most common stem flap used for breast reconstruction is the latissimus dorsi (LD) flap, in which tissue from the back is used to construct a new breast. Abdominal wall tissue can also be used as a pedicle flap, but this has largely been superseded by its free flap version, where the muscle can be fully or partially preserved [51-53].

**A2) Free flap:** A free flap moves tissue, fat, skin, and part of the muscles in one area of the body to create a new breast. This tissue is completely removed from the body and moves towards the chest, and then the blood vessels (arteries and veins) should be reattached to the chest wall vessels to keep the tissue alive. It requires the use of a microscope to ligate small vessels, and the surgery takes longer than the pedicle flap. In most cases, free flaps do not require muscle removal from the donor area. Therefore, there is less risk of losing muscle strength and the donor site is often better than when the muscle was removed [54]. The main risk is that sometimes the blood vessels become blocked and the flap does not work due to poor or no blood supply. The abdominal wall is the most popular and common

donor site for breast reconstruction. Other possible donor areas for reconstruction are the breast, thigh, hip, and back [55-57].

### **B) DIEP flap**

Another method used for breast reconstruction using a flap is free DIEP flap method. In this surgical method, fat and skin are removed from the TRAM flap area. The main difference between DIEP method and free TRAM flap is that in this method, no muscle will be separated from the abdominal wall. To perform breast reconstruction surgery with the DIEP free flap method, the tissue is completely removed from the abdomen and transplanted to the chest [58-60].

In this method, it is necessary to connect blood vessels to the chest area with the help of microsurgery. In breast reconstruction surgery with the DIEP method, the appearance of abdomen will be completely preserved because no muscle is removed from the abdominal area. It is necessary to know that the breast reconstruction surgery with free MS-TRAM flap method has a completely similar mechanism to DIEP flap surgery. However, in the MS-TRAM method, a small muscle should be removed from the abdominal wall. In the DIEP flap, no muscle will be removed from this wall. In breast reconstruction surgery with free gluteal flap or GAP, tissues in the buttock area are used to reconstruct breast tissue. The GAP flap method is usually used in women who cannot use abdominal tissues. For example, the abdominal tissues or muscles of abdominal wall may be too thin or have a history of surgical incision due to the previous surgeries [6].

In breast reconstruction surgery, after the operation with GAP method, fat, skin, and blood vessels must be separated from the buttocks and transferred to the chest [4]. It is necessary to know that in this type of breast reconstruction surgery, no muscles will be separated from the buttocks. Blood vessels should be further

connected in the chest area to continue blood supply to the tissue [6]. If the artery above the hip is used, the surgical method is called SGAP. Meanwhile, for the flaps removed from the lower part of the hip, the title IGAP is used. One of the most important disadvantages of breast reconstruction surgery after mastectomy with the GAP flap method is the distortion of contour of the buttock area and creation of a depression in its lower area. This issue can affect the beauty of female body. Of course, this is also related to the volume of removed tissue [17].

### **C) Dorsi latissimus flap (LD)**

In breast reconstruction, the required tissues, including fat, skin, and muscle are directed from the waist to the chest by using the dorsal latissimus flap. In fact, to perform this surgical procedure, it is necessary to use the pedicle surgery technique, which includes muscle transfer without cutting blood vessels [3]. Dr. Farhad Mousazadeh is one of the top doctors in this method and has more than 20 years of experience in the field of breast reconstruction [16].

### **D) TUG (Transverse Upper Gracilis) flap:**

Sometimes the muscles in the abdominal area may not be suitable for breast reconstruction after mastectomy. In such a situation, the doctor replaces the patient's breast tissue by using tissues from the thigh area. Based on the patient's condition and according to the doctor's opinion, TUG flap is removed from the inner or outer thigh area. It is necessary to pay attention to the point that in breast reconstruction after mastectomy with TUG flap method, like other methods, blood vessels should be connected to the chest area through microsurgery. Likewise, it is worth to note that the tissues in thigh area may not be enough to create breast tissue [1]. In such a situation, the doctor will use two flaps taken from both thighs to reconstruct the breast. In breast reconstruction surgery using TUG flap, the flap

incision is made in the upper part of thigh area and transversely. In other methods, including DUG and VUP, the cutting type will be diagonal and vertical, respectively [5].

### **Complications of breast flap surgery in breast reconstruction**

Breast reconstruction surgery using a flap will not cause many complications compared to other methods of breast reconstruction after mastectomy and lumpectomy. However, this type of surgery can also have its own complications. For example, given that the replacement tissue is transferred to the chest from another part of the body [3]. Therefore, there will be a possibility of changing the skin color between chest and chest area. This condition will appear mainly as a discolored circle or colored spot on the skin. In addition, in breast reconstruction surgery, it is usually necessary to separate the required tissue from another part of the body [13]. This problem will lead to the creation of wounds and cuts in another area of the body, which leads to the creation of permanent scars. Another point is that due to perform surgery in both areas of the body, the surgery duration will be longer than normal. In many cases, even more time is required for hospitalization and complete recovery [15]. One of the most important complications of breast reconstruction surgery using a flap is the lack of sensitivity in breast area [23]. In fact, the breasts reconstructed with flap method will be less sensitive than the original breasts. Even in some people, there may not be any sensitivity in the reconstructed breast area, although the main goal is to preserve the appearance and restore women's self-confidence, and naturally, the reconstructed breast will not have any function [3]. Although flap breast reconstruction surgery after mastectomy will be successful in many cases, it is still possible for the tissues to die immediately after operation. For example, it is possible that the blood supply to breast flap is blocked. This problem leads to the loss of flap and

requires secondary surgery [43]. However, if the surgery is performed by an experienced and reliable surgeon, the result of the surgery will undoubtedly be satisfactory and the complications will be minimized. Among other side effects caused by breast reconstruction after mastectomy using a flap, fat necrosis can be mentioned [21]. This also happens if the blood supply to the flap tissue is not done properly. Fat necrosis in the breast area appears in the form of a hard and lump-like tissue in breast. It is necessary to know that fat necrosis with small dimensions will disappear after some time, but if severe necrosis occurs, it is necessary to undergo surgery or liposuction [1]. The best way to correctly diagnose fat necrosis and eliminate it is to visit a specialist doctor and check the condition of reconstructed breast.

### **Conclusion**

Many studies show that breast loss is a great psychological loss for women, which causes depression in them. Breast reconstruction reduces these problems and psychological symptoms caused by it. Breast reconstruction after mastectomy has evolved over the past century and is an integral part of treatment of breast cancer patients. Breast reconstruction was initially designed to reduce post-mastectomy complications and correct the deformity of chest wall, but now performing this surgery is not limited to this point of view and its high value is known. Breast beautification has increased significantly in the last decade following mastectomy. Especially, breast reconstruction has greatly improved the quality of life of patients who underwent mastectomy. Breast reconstruction after mastectomy due to breast cancer has become a serious necessity in today's society, and correcting distorted body image, satisfying, and recharging a person's mental and emotional well-being as well as establishing self-confidence and social and family efficiency are among the most important motivational issues.

Reconstruction is sometimes done immediately after the surgery and it is done by the surgeon at the same time as the breast removal surgery, but if it is necessary to do chemotherapy or radiotherapy after the operation, it is better to do restoration about 6 months after completion of all treatments.

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