Advances in Breast Reconstruction of Mastectomy and Lumpectomy Defects

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KEYWORDS

• Breast reconstruction • Tissue expander • Implant • Autologous flap
• Tissue transfer • Acellular dermal matrix • Autologous fat grafting • Radiation

KEY POINTS

- Breast reconstruction efforts complement oncologic interventions in breast cancer patients, with the ultimate goal of restoration of breast form and function.
- Use of acellular dermal matrices in tissue expander/implant–based breast reconstruction represents one of the most significant advances in implant reconstruction in the past decade.
- Free flap and perforator flap options expand patients' choices for reconstruction and result in breasts that are natural in both appearance and feel. These techniques are also better suited than implants for reconstruction of obese patients.
- Partial breast reconstruction options should be considered in all patients who opt for breast conservation therapy.
- Improvements in fat grafting techniques have the potential to improve on all existing forms of breast reconstruction and revolutionize the approach to breast reconstruction as a whole.

Videos of intraoperative perfusion mapping of mastectomy flaps and an abdominal flap after an intravenous injection of indocyanine green dye accompany this article at http://www.surgonc.theclinics.com/

INTRODUCTION

Breast reconstruction is achieved through various reconstructive techniques that attempt to restore the breast to near-normal shape, appearance, and size after oncologic surgical resection in the form of lumpectomy or mastectomy. Several factors, including earlier detection of breast cancer and advances in radiation therapy and

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systemic treatments, have contributed to increased use of breast preservation and skin-sparing surgical techniques in the management of breast cancer patients. As a complement to these changes in management, breast reconstruction has evolved from procedures aimed at simply creating a breast with a satisfactory appearance when clothed to a series of procedures aimed at creating a breast that meets high aesthetic standards when bare. The psychological, social, emotional, and functional benefits of breast reconstruction have been well documented over the past 30 years. Previous studies have demonstrated the positive effects of postmastectomy reconstruction on psychological health, self-esteem, sexuality, and body image.[1] These benefits will likely be enhanced as implant technology and surgical techniques evolve, with an improvement in the quality of the reconstructed breast. Today the surgical repertoire for breast reconstruction includes several autologous tissue flaps and prosthetic techniques using tissue expanders and implants. The most recent advances in breast reconstruction are presented.

RECONSTRUCTION OF MASTECTOMY DEFECTS

Factors ranging from oncologic treatment plans to patient-specific factors are taken into consideration when planning a reconstructive strategy. A team-based approach with open communication between medical oncologists, radiation oncologists, oncologic surgeons, and reconstructive surgeons helps simplify planning. Key decisions that need to be made with a perspective of the treatment plan include the type and timing of reconstruction.

Decisions on Type of Reconstruction

Several options are available to women who choose breast reconstruction after mastectomy. The 2 broad categories available to patients include techniques using prosthetic implants and those involving autologous tissue flaps.

Some women have an inherent preference with regards to the technique, whereas others' medical history or lifestyle may steer them toward a particular option. Although it is important that patients have a choice in the type of reconstruction performed, not all reconstructive options are available to every patient. **Fig. 1** provides an algorithm highlighting some factors that affect the choice of reconstructive technique offered. It is the responsibility of the reconstructive surgeon to provide information to the patient about all potential options and provide guidance that allows her to make a decision that results in the safest and most aesthetically pleasing outcome.

Decisions on Timing of Reconstruction

The decision on immediate or delayed reconstruction in general is influenced by cancer staging, with delayed reconstruction favored in advanced-stage cancers that require postmastectomy radiation therapy (PMRT) or close surveillance. Most patients tend to prefer immediate reconstruction, which takes advantage of skin preservation while minimizing the length of time spent without a breast. Patients may also opt to wait on reconstruction if the combined process of oncologic treatment and reconstruction seems overwhelming. The need for PMRT tends to be the predominant reason influencing the choice for delayed reconstruction. Delayed reconstruction, for patients requiring radiation therapy, is typically advocated for several reasons, including the avoidance of untoward effects of radiation on the results of an immediate reconstruction and the potential for delaying oncologic treatment as a result of complications from reconstruction. In an attempt to take advantage of the skin preserved in a skin-sparing mastectomy in patients who require radiation, several plastic