Oncoplastic Breast Reconstruction

Should All Patients be Considered?

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KEYWORDS

• Breast cancer • Breast preservation • Oncoplastic surgery • Reconstructive surgery • Cosmesis

KEY POINTS

- Partial mastectomy with radiation therapy results in a poor cosmetic outcome requiring additional surgery in up to 30% of patients.
- Poor cosmetic outcome after partial mastectomy can be due to either volume loss, scar contracture, or malalignment of the nipple areolar complex.
- Oncoplastic techniques can be used in all sizes of tissue defects after partial mastectomy to reduce the poor cosmetic outcome.
- Collaborating with a plastic surgeon can increase the number of patients that are candidates for breast preservation and allow larger volumes of resection and contralateral symmetry procedures.
- Oncoplastic surgery focuses on maintaining the normal breast contour and the blood supply and position of the nipple and areola.

INTRODUCTION: NATURE OF THE PROBLEM

Surgical techniques involving breast cancer have recently evolved in 3 important areas: patient recovery, oncological safety, and optimal cosmetic outcome.[1] The first recorded surgical management of breast cancer dates back to 3000 to 2500 BC as described in *The Edwin Smith Surgical Papyrus*, the oldest known surgical treatise.[2]

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No significant advancements took place until the first century AD when a Greek physician named Leonidas developed a surgical approach through incision and cautery.[1] For the next few centuries, progress was minimal and few individuals contributed to the improvement of mastectomy. Some of those who contributed were Galen, Jean Louis Petit, Joseph Pancoast, and Samuel Gross.[1,3] Due to high mortality rates from infection and the intolerable postoperative pain, mastectomy was not popular until the introduction of anesthesia in the nineteenth century. Dr William Halsted[4] is credited with developing the technique to safely perform a radical mastectomy. Dr Halsted used anesthesia and the concept of sterilization and disinfection to dramatically improve the outcome of the procedure. From that time on, procedures for breast cancer gained momentum and breast cancer surgical therapy started to evolve toward less invasive approaches while maintaining optimal oncologic outcomes; for example, Patey[5] and Handley[6] described the modified radical mastectomy, sparing the pectoralis major muscle.

In the twentieth century, surgical management of the breast further evolved to breast conservation therapy, taking advantage of increased understanding and use of hormonal therapy, chemotherapy, and radiotherapy.[7–9] This change in surgical management was made possible by the completion of large randomized clinical trials in the 1970s and 1980s, which demonstrated that in specific patient populations the less extensive surgical approach of partial mastectomy has equivalent oncological outcomes to mastectomy when performed with appropriate adjuvant therapy.[7,10]

The improvements in surgical techniques have not only addressed survival but also cosmesis. Breast reconstruction after mastectomy is available to most women. One of the earliest records of breast reconstruction after mastectomy is from the French surgeon Verneuil in 1887, who performed autologous tissue transfer from the healthy breast to the diseased breast.[11] Since then, other approaches have been developed, including both autologous and prosthetic reconstruction. The initial efforts focused on reconstruction of mastectomy defects. Only recently has reconstruction of the breast after partial mastectomy been considered important. Surgeons are now expanding the indications for breast preservation, resulting in more extensive partial mastectomies that increase the risk for cosmetic deformity.[12]

A critical aspect that should be considered when performing breast cancer surgery, either partial mastectomy or mastectomy with reconstruction, is to maintain the natural look and shape of the breast, anticipating the effects of radiation on the partial mastectomy cavity and the mastectomy flaps. It has been reported that up to 30% of women undergoing partial mastectomy with radiation therapy will develop breast disfigurement requiring further surgical correction.[13] To address the cosmetic defects that result from partial mastectomy, breast reconstruction procedures have been developed or adapted from breast cosmetic procedures. In the early 1990s, Audretsch[14] suggested integrating plastic surgery principles with breast conservative surgeries.[14–16] Currently, integrating oncological surgical techniques and plastic surgery techniques is referred to as oncoplastic breast surgery, which aims to provide the optimal oncological safety outcomes in addition to achieving a favorable breast cosmesis for patients undergoing breast preservation. The term oncoplastic is Greek in origin for molding of tumor.[17] John Bostwick III introduced the term tumor-specific immediate reconstruction in 1996 and proposed his classification for oncoplastic breast surgery.[18,19]

Four main factors influence the extent of breast deformity after breast conservation: (1) tumor location, (2) tumor to breast size ratio, (3) use of radiotherapy, and (4) surgical resection approach.[16] Oncoplastic breast surgical approaches have evolved over the years. To achieve optimal outcomes, patient selection criteria and several surgical approaches were studied and proposed. It is vital for all surgical oncologists