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Surgeon motivations behind the timing of breast reconstruction in patients requiring postmastectomy radiation therapy

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Summary Objectives: Although postmastectomy radiation therapy (PMRT) has been shown to reduce breast cancer burden and improve survival, PMRT may negatively influence outcomes after reconstruction. The goal of this study was to compare current opinions of plastic and reconstructive surgeons (PRS) and surgical oncologists (SO) regarding the optimal timing of breast reconstruction for patients requiring PMRT.

Methods: Members of the American Society of Plastic Surgeons (ASPS), the American Society of Breast Surgeons (ASBS), and the Society of Surgical Oncology (SSO) were asked to participate in an anonymous web-based survey. Responses were solicited in accordance to the Dillman method, and they were analyzed using standard descriptive statistics.

Results: A total of 330 members of the ASPS and 348 members of the ASBS and SSO participated in our survey. PRS and SO differed in patient–payor mix ($p < 0.01$) and practice setting ($p < 0.01$), but they did not differ by urban versus rural setting ($p = 0.65$) or geographic location ($p = 0.30$). Although PRS favored immediate reconstruction versus SO, overall timing did not significantly differ between the two specialists ($p = 0.14$). The primary rationale behind delayed breast reconstruction differed significantly between PRS and SO ($p < 0.01$), with more PRS believing that the reconstructive outcome is significantly and adversely affected by

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radiation. Both PRS and SO cited “patient-driven desire to have immediate reconstruction” ($p = 0.86$) as the primary motivation for immediate reconstruction.

Conclusions: Although the optimal timing of reconstruction is controversial between PRS and SO, our study suggests that the timing of reconstruction in PMRT patients is ultimately driven by patient preferences and the desire of PRS to optimize aesthetic outcomes.

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Introduction

The integration of cross-disciplinary interventions from surgical oncology, reconstructive surgery, and radiation therapy has improved outcomes and quality of life for patients with locally invasive breast cancer. Although these interventions have improved survival, the optimal timing of breast reconstruction in relation to postmastectomy radiation therapy (PMRT) remains a controversial topic between plastic and reconstructive surgeons (PRS) and surgical oncologists (SO). For example, many patients require radiation following mastectomy, an intervention referred to as PMRT.^{1–4} Although breast reconstruction is an essential part of patient care, it also has the potential to complicate further cancer treatment. Conversely, radiation therapy may compromise the overall aesthetic outcome and patient satisfaction with the repair.

Three options exist for breast reconstruction. “Immediate” breast reconstruction may be performed following the mastectomy under the same course of anesthesia. “Delayed” breast reconstruction is performed at a later time as a separate operation. “Delayed–immediate breast reconstruction,” described subsequently, is a two-step procedure that stakes a claim to the middle ground between the immediate and delayed methods.^{2,4} In all methods, a subsequent, smaller touch-up procedure is typically employed some months after the first reconstructive operation.

Each method offers distinct advantages and disadvantages. Immediate breast reconstruction yields superior short-term aesthetic, psychosocial, and quality of life results compared with delayed reconstruction.^{2,5} Immediate reconstruction only involves a single initial operation, a shorter period of hospitalization, and a lower overall cost.^{2,6–9} Some studies suggest that all patients should pursue immediate reconstruction following mastectomy on account of the psychosocial benefits, regardless of age or associated comorbidities.^{10–12}

Immediate reconstruction is widely preferred if PMRT is not anticipated. However, in some cases, the need for PMRT cannot be reliably determined until review of the permanent tissue sections. Some authors note a slight increase in complications such as increased susceptibility to infection, decreased wound-healing capacity, tissue fibrosis, shrinkage, and decreased elasticity in immediate reconstruction.^{13–17} It has also been associated with a higher rate of *late* complications compared with delayed reconstruction. In addition, immediate reconstruction may possibly increase the amount of radiation needed for

effective radiotherapy, and theoretically it may increase the radiation dose to the heart and lungs.¹⁸

Delayed breast reconstruction avoids these disadvantages, and it may be preferable for patients who will require PMRT (i.e., patients with stage III+ breast cancer). However, delayed reconstruction results in neither superior oncological outcomes nor improved technical feasibility compared with immediate reconstruction.^{19–21} In addition, while several studies have reported complications secondary to radiotherapy in the setting of immediate breast reconstruction, there is a lack of firm consensus in the literature.^{22,23}

Some authors advocate a middle ground in the form of delayed–immediate reconstruction, a two-stage method combining elements of both other methods. Delayed–immediate reconstruction optimizes reconstruction in patients who may require postoperative PMRT.^{24–26} A skin-sparing mastectomy is performed, and a tissue expander is placed to prevent the skin envelope from shrinking down and becoming irreversibly contracted and scarred. If needed, PMRT is administered with the tissue expander in place, thus sparing the anticipated autologous reconstruction from radiation damage. The expander is then replaced with autologous tissue at a second stage. This method allows patients who do not require PMRT to receive the benefits of skin-sparing mastectomy with aesthetic outcomes similar to those of immediate reconstruction. However, patients who do require PMRT receive a skin-preserving delayed reconstruction, which effectively imports a large mass of healthy unirradiated autologous tissue to augment the blood supply of native radiation-damaged breast skin. This helps mitigate the aesthetic complications that can occur after immediate breast reconstruction followed by PMRT.

Currently, the optimal timing of reconstruction and PMRT in the treatment of breast cancer remains a controversial topic, with different viewpoints from each type of specialist.^{26,27} As stated, the goal of this study is to assess and compare the opinions of PRS and SO on this topic.

Methods

Members of the American Society of Plastic Surgeons (ASPS), the American Society of Breast Surgeons (ASBS), and the Society of Surgical Oncology (SSO) were invited to participate in an anonymous, web-based survey of their preferred timing and method of breast reconstruction in patients who will receive PMRT. Responses were systematically solicited in a manner consistent with the total

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