

# New Insights into the Surgical Management of Breast Cancer



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William Halstead is considered by many as the father of modern breast surgery. He popularized the notion that breast cancer progresses in an orderly fashion and that appropriately timed radical surgery can interrupt this progression to save lives. This view dominated for nearly 100 years and still persists to one extent or another in the minds of physicians and patients alike. Rapid advances in breast cancer biology have highlighted the heterogeneity of breast cancer and paradigm-shifting clinical trials have successfully challenged prevailing wisdom to effect a sea change in breast cancer surgery. Advances in radiation and systemic therapies permit more limited surgery for most patients. Recurrence rates of all kinds are on the decline; yet, paradoxically, use of bilateral mastectomy is increasing.

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## Role of the Breast Surgeon

Modern breast cancer treatment is an evidence-based, multimodal endeavor. Theoretically, a technician could enter a few medical history, imaging, and pathology variables into a computer and then e-mail the newly diagnosed patient an evaluation and treatment calendar based on the relevant practice guidelines. This should be resisted in the future, though it may be unavoidable.

The breast surgeon usually provides the initial consultation after a new breast cancer diagnosis. This is an emotional time when myriad unknowns often fuel crippling anxiety. Consultation with a surgeon who possesses global knowledge of breast cancer biology and treatment options coupled with excellent communication skills ensures that the patient leaves this initial visit in a much better state of mind. At a minimum, the breast surgeon must have a working knowledge of the sources of heterogeneity in breast cancer natural history, genetics, breast imaging, breast surgery, systemic therapies, and radiation oncology. This knowledge is required to plot a likely course through the treatment journey and help the patient see the finite timeline leading to restoration of physical and psychological health.

After treatment begins, the breast surgeon shares responsibility with all of the other disciplines for optimizing outcomes. The primary role of the breast surgeon in the treatment phase of care is local-regional control. Operations must be tailored to individuals to maximize physical, psychosocial, and sexual functioning. Zeal to avoid local-regional recurrence must be balanced against the need to preserve breast contour and symmetry and to reestablish a sense of well-being.

## Breast-Conserving Surgery

Multiple randomized clinical trials have demonstrated that survival for early breast cancer is the same whether the breast is removed or not.<sup>1,2</sup> Breast conservation is appropriate for most women diagnosed with early-stage breast cancer. Currently more than two-thirds of women with early breast cancer are treated with breast-conserving surgery (BCS),<sup>3,4</sup> but this has been decreasing in recent years.<sup>3</sup>

The goal of partial mastectomy is to completely remove the cancer while preserving an excellent cosmetic outcome. It is never known with certainty whether there is residual cancer or not after surgery. Indeed, breast whole-mount studies have identified tumor foci more than 2-cm distant from the main tumor mass in 42%-47% of patients.<sup>5,6</sup> The current standard is to accept a rim of normal breast tissue all of the way around the tumor as evidence of complete excision. The risk of local recurrence is more than doubled if this is not achieved.<sup>7</sup>

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Excision volume correlates strongly with eventual cosmetic outcome.<sup>8</sup> The breast surgeon must carefully balance the competing goals of avoiding local recurrence while preserving contour and symmetry. Historically, 11%-59% of patients are returned to the operating room for re-excision of close or positive margins,<sup>8-12</sup> but residual tumor is identified in only 23%-68%<sup>13-17</sup> and this is most likely to be in situ cancer. Routine shaving of additional margins,<sup>18,19</sup> intraoperative ultrasound guidance,<sup>20</sup> radioisotope guidance,<sup>21,22</sup> and intraoperative frozen section analysis<sup>23</sup> have been investigated as approaches for reducing re-excision rates, but simply redefining a negative margin as “no ink on tumor” is likely to have the greatest effect (discussed later).

For women who desire a smaller breast size, lumpectomy can be combined with bilateral reduction mammoplasty (Fig. 1). This so-called oncoplastic partial mastectomy permits

excision of larger volumes of breast tissue, increasing the probability of negative margins with a single procedure even with larger tumors.<sup>24</sup> Positive margins in this setting often result in mastectomy rather than re-excision.

Certain tumor features may alert the surgeon to impending margin difficulties. These include the presence of microcalcifications, mammographic density, lobular histology, and the presence of a DCIS component on the core biopsy.<sup>25-29</sup> Predictors of residual tumor in the re-excision specimens include tumor size >3 cm, age <45 years, high tumor grade,<sup>14</sup> and the extent of the involvement of the initial margins.<sup>15</sup> Clinical judgement should dictate whether a given patient is returned to the operating room for re-excision or not. Even if there is “no ink on the tumor,” multiple close margins or even a margin that is close for DCIS increases the probability of finding residual disease.<sup>13</sup>



**Figure 1** Breast reconstruction. (1A and B) “Oncoplastic” partial mastectomy combines a wide local excision with reduction mammoplasty, (2A and B) bilateral skin-sparing mastectomy with DIEP flap and nipple reconstruction, (3A and B) right nipple-sparing mastectomy with implant reconstruction and left augmentation for symmetry. (Adapted with permission from Dr Michele Manahan.)

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