

Evolution of modern breast cancer treatment: when less is more

In this special issue of *Gland Surgery*, I am privileged to work with internationally renowned experts in many fields to present a focused collection of articles reviewing topics of critical interest to patients and their physicians seeking optimal long term health following a diagnosis of breast cancer. This collection captures the rapid evolution in our field, with particular focus on therapies that may provide superior outcomes while mitigating long term toxicity for the patient.

The evolution of care for any complex medical condition like breast cancer is driven by the accrual of knowledge through carefully conducted clinical trials, by the passage of time, and by empathy, as we observe the consequences of our interventions years and even decades after they are implemented. Arguably, no more complex a problem exists in medicine than the management of women (and men) with invasive breast cancer whose care may involve at varying times surgeons with varying expertise (oncologic, reconstructive or both), medical oncologists, radiation oncologists, radiologists, genetic counselors, cardio-oncologists, fertility experts, palliative care specialists, psychosocial support persons, and experts in survivorship. Minimizing the chance of secondary malignancy, cardiotoxicity or other serious late complications following a diagnosis of breast cancer is paramount, influenced by the very first decisions made and the therapeutic options.

In search of optimal therapy for invasive, early stage breast cancer, patients are first and foremost concerned about the probability of and potential for cure, influenced by fear of developing advanced disease that is all too often incurable. Over the course of time, the potential for surgery, hormonal therapy, systemic chemotherapy, and radiation therapy to reduce recurrence and improve survival have become well known. Each has been shown to be beneficial when properly applied singly or in combination, yet all have had late effects or long term complications. The dynamic evolution of each modality and the timing of their use has made it necessary for clinicians to understand a rapidly changing collection of competing benefits and risks.

The fields of surgical oncology and oncoplastic surgery, discussed by Dr. Abhishek Chatterjee, Chief of Plastic Surgery and surgical oncologist at Tufts Medical Center and Tufts Medical School, highlights how modern surgical techniques and evolution of mastectomy can greatly expand options for patients that reduce morbidity and extent of surgery (1). Oncoplastic surgery is a new and growing specialty that has expanded options for patients with potential for improved outcomes and patient experience.

Dr. Alphonse Taghian, Chief of Breast Radiation Oncology and Co-Director Breast Cancer Research Program at Massachusetts General Hospital and Harvard Medical School and his colleagues discuss the science behind the development of lymphedema, a recognized and potentially serious complication of locoregional management of breast cancer, while emphasizing the curative potential for radiation therapy when properly applied (2).

Drs. Kathryn Huber and David Wazer of Tufts Medical School and Brown University and colleagues discuss the use of Radiation in the context of other late complications that may occur months and even years after treatment has ended, reinforcing the continued need for individualized decision making (3).

Dr. Charles Shapiro, Co-Director of the Dubin Breast Center at Mount Sinai's Tisch Cancer Institute and Johanna Suskin reviews the musculoskeletal complications related to interventions that may improve survival from breast cancer, yet potentially impact women by increasing musculoskeletal complications and by extension quality of life (4).

Dr. Don Dizon, Head of Women's Cancers, Lifespan Cancer Institute and Director of Medical Oncology, Rhode Island Hospital and Brown University and colleagues provide an insightful look at some of the most important questions facing a premenopausal woman contemplating treatment for breast cancer, namely those of sexuality, fertility and pregnancy following breast cancer treatment (5). The emergence of treatment decision aids to better select those for adjuvant treatment with novel agents—both hormonal and chemotherapeutic—and the investigation of optimal duration of use of hormonal agents have all impacted a woman's sexual health and expectations for conceiving a child following a diagnosis of breast cancer.

Finally, the relatively new field of Cardio-Oncology has transformed our thinking on the treatment and prevention of cardiac complications. Jenica Upshaw MD, Medical Director of the Cardio-Oncology Program at Tufts Medical Center discusses what can be done not only at time of diagnosis of cardiac complications, but also the exciting potential for preventing such complications (6). The birth of this specialty recognizes and acknowledges that years and decades after systemic therapy for breast cancer, we may see undesirable complications related to cardiovascular health. Each of our principal modalities for therapy, including anthracycline based chemotherapy, biological therapies directed at signaling

(e.g., trastuzumab) or vasculature (e.g., bevacizumab), radiation therapy and hormonal therapy which may include ovarian suppression or be extended to 10 years, may have effects on cardiovascular health—months, years or decades after therapy is completed. Therefore it is of critical importance for patients and their caregivers to anticipate the potential for harm and to assess this potential in the context of age at diagnosis and other health concerns of the patient.

A patient with breast cancer who is treated in her 30s is in need of considering every one of these topics when selecting the best approach to treatment, and patients of all ages will have a variety of concerns specific to them. Expert clinicians must be able to present both short and long term benefits and harms relative to these issues, particularly when there are a variety of options for treatment. We are beginning for example to see mature data on the effectiveness of non-anthracycline based chemotherapy regimens so that we can compare them to the known anthracycline regimens relative to efficacy as well as cardiovascular and hematologic risks inherent in their use. Similar discussions related to duration of hormonal therapy and evolving radiation techniques will inform our decision making in the decades ahead.

An issue such this one in *Gland Surgery* provides the reader with a great opportunity to reflect not only on the immediate benefits of cancer therapy, but also on the long term issues inherent in cancer survivorship, a specialty within oncology that is exploding in importance and interest for patients and therapists alike. As therapies increasingly lead to cure, late side effects related to their use are of increasing importance. Complicating our efforts to estimate benefits and harms is the recognition that the published literature derived from clinical trials is only one estimate of harms that may differ substantially from what is observed in the real world when the same interventions are applied (7,8). That is what makes this collection of articles is so compelling, as they come from experts with extensive experience both at the bedside and in critical development and analysis of the data in the field of breast oncology that we all rely upon to make decisions in the best interest of our patients.

Acknowledgements

None.

References

1. Chatterjee A. Long term effects of modern breast cancer surgery. *Gland Surg* 2018;7:366-70.
2. Gillespie TC, Sayegh HE, Brunelle CL, et al. Breast cancer-related lymphedema: risk factors, precautionary measures, and treatments. *Gland Surg* 2018;7:379-403.
3. Brownlee Z, Garg R, Listo M, et al. Late complications of radiation therapy for breast cancer: evolution in techniques and risk over time. *Gland Surg* 2018;7:371-8.
4. Suskin J, Shapiro CL. Osteoporosis and musculoskeletal complications related to therapy of breast cancer. *Gland Surg* 2018;7:411-23.
5. Lopresti M, Rizack T, Dizon DS. Sexuality, fertility and pregnancy following breast cancer treatment. *Gland Surg* 2018;7:404-10.
6. Upshaw JN. Cardio-oncology: protecting the heart from curative breast cancer treatment. *Gland Surg* 2018;7:350-65.
7. Hassett MJ, O'Malley AJ, Pakes JR, et al. Frequency and cost of chemotherapy-related serious adverse effects in a population sample of women with breast cancer. *J Natl Cancer Inst* 2006;98:1108-17.
8. Erban JK, Lau J. On the toxicity of chemotherapy for breast cancer--the need for vigilance. *J Natl Cancer Inst* 2006;98:1096-7.



John K. Erban

John K. Erban, MD

Tufts Medical Center, Tufts University School of Medicine, Boston, MA, USA.

(Email: jerban@tuftsmedicalcenter.org)

doi: 10.21037/gs.2018.07.06

Conflicts of Interest: The author has no conflicts of interest to declare.

View this article at: <http://dx.doi.org/10.21037/gs.2018.07.06>

Cite this article as: Erban JK. Evolution of modern breast cancer treatment: when less is more. *Gland Surg* 2018;7(4):347-349. doi: 10.21037/gs.2018.07.06