Radiation Therapy: A Core Component of Breast Conservation

Radiation therapy plays an important part in the care of many breast cancer patients. The term breast conservation therapy (BCT) is a combination of breast conserving surgery (also referred to as lumpectomy) and radiation therapy. It is only in rare circumstances that breast conservation surgery is undertaken without planned radiotherapy to follow. For patients that undergo mastectomy instead of breast conservation surgery, radiation therapy may still play an important role, but it is not of universal benefit as it is after breast conservation surgery.

Many options exist for radiation therapy after lumpectomy. “Conventionally fractionated” whole breast irradiation remains the standard treatment in the United States and is the treatment received by most women after lumpectomy. “Conventionally fractionated radiation” refers to dividing the total radiation dose into small amounts which are delivered on a 5-treatment per week basis, for a total of five to six and a half weeks. The entire breast is treated for the majority of the treatment course. Near the end of the treatment, only the specific region of the breast which formerly contained the tumor is targeted, typically for the last 5 treatments; this more focused component of the treatment is referred to as a “radiation boost.”

Whole breast irradiation has demonstrated a clear and significant benefit with regard to preventing breast cancer from recurring in the breast. In large studies, the risk of recurrence has been decreased by a relative factor of approximately two-thirds. As well, large pooled studies have indicated that for every 4 recurrences prevented in the breast, that equates in the long term to saving one woman’s life from breast cancer.

The side effects of whole breast radiation therapy are typically thought of in terms of potential short term and potential long term side effects. In the short term, whole breast irradiation can irritate the skin and cause fatigue. In the long term, there is a risk of lymphedema in the arm, related to the cancer, surgery and radiation. There is also a potential cosmetic risk: with surgery and radiation, the affected breast will be somewhat smaller and can after treatment loose some symmetry in size, shape, and feel in comparison to the unaffected breast – although, with modern techniques, these differences have been significantly minimized for most patients. There can also be risks related to radiation exposure to the ribs, lung and heart directly underlying the breast. However, radiotherapy techniques have dramatically improved in the last 2 decades, such that these risks have been dramatically reduced. As in any case in which ionizing radiation is used in medicine, there is a very low risk of actually causing a cancer, but for most patients, such a risk is very, very low.

In general, conventionally fractionated radiation therapy for breast cancer following lumpectomy is safe, effective with regarding to curing cancer, and leads to a very good cosmetic outcome for the majority of patients. A number of alternatives to conventional whole breast irradiation are now available. These alternative techniques generally either target only a portion of the affected breast – focusing entirely on the region of the original tumor; or, accelerate treatment such that it is delivered in 2 to 3 weeks. I will touch upon these techniques in my next commentary…