

Breast Cancer and Accelerated Partial Breast Irradiation

In the past, women with breast cancer were treated with mastectomies. For women who presented with earlier stage disease, studies showed that lumpectomy followed by whole breast radiation was roughly equivalent to mastectomy in terms of local control and overall survival. Whole breast radiation is radiation that is delivered to the entire breast on a daily, Monday through Friday, basis for approximately 5-7 weeks. This is delivered after chemotherapy, if needed.

The studies also showed that if radiation is omitted after a lumpectomy the rate of recurrence is increased. With breast imaging improving and women presenting with even earlier stages of disease there is a lot of interest in determining whether or not treating less than the whole breast with radiation would be equivalent to whole breast radiation. Treating less than the whole breast is called accelerated partial breast irradiation (APBI) and targets just the area of breast tissue around where the tumor was removed. Because a smaller volume of tissue is treated, a larger dose of radiation can be delivered during each treatment. Most APBI techniques involve giving radiation twice a day for five days and can be delivered shortly after surgery (and before chemotherapy, if needed).

APBI can be done in many ways. The earliest trials used multiple catheters threaded through the breast for low risk patients and the results appear to be equivalent to patients treated with whole breast radiation in terms of local control and survival. The selection criteria typically included age greater than 45, tumor size less than 3cm, infiltrating ductal carcinoma tumors with negative surgical margins.

The most popular technique is the MammoSite catheter which is a single catheter, albeit slightly larger in diameter, with a balloon attached at one end. This catheter is placed into the lumpectomy cavity either at the time of surgery or within a few weeks of surgery under ultrasound guidance. On the catheter is in the breast, the balloon is inflated to make the lumpectomy cavity conform to the surface of the balloon. The treatment planning time is quite quick and the treatment takes about 5-10 minutes each session and is done on an outpatient basis. There is no radiation left inside the patient. After the final treatment, the balloon is deflated and removed from the breast.

Because this technique was somewhat difficult for doctors, patients and physicists (the people who help the doctors plan the radiation treatment), other techniques have been investigated.

A single catheter technique was then developed and now many sizes and types of single entry site catheters have been developed, including MammoSite, Contura and SAVI catheters. These catheters are placed into the lumpectomy cavity either at the time of surgery or within a few weeks of



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surgery under ultrasound guidance. Once the catheter is in the breast, the device is expanded to make the lumpectomy cavity conform to the device. The treatment planning time is much quicker and the treatment takes about 5-10 minutes each session and is done on an outpatient basis. There is no radiation left inside the patient. After the final treatment, the device is collapsed and removed from the breast.

The results from these early trials have created a lot of interest in partial breast radiation and a large national trial is currently underway (run by NSABP and RTOG cooperative groups) to compare whole breast radiation and partial breast radiation head-to-head. It is open to women 18 years and older with tumors 3cm or smaller with negative margins. Women can have node-positive disease if they have 3 or fewer nodes involved without extension through the capsule of the node and can have any type of breast cancer. This trial also allows for delivering partial breast treatment using 3-D conformal external beam radiation for patients who cannot have a catheter/catheters placed due to location or due to patient/doctor preference. The trial has already enrolled all the needed patients in the lowest risk groups and follow-up data is being collected. The results of this study will help doctors decide who can safely be treated with partial breast radiation.

The physicians of Radiation Oncology Consultants, Ltd have been treating patients with partial breast irradiation since April, 2003 on various available protocols including treating patients on the current NSABP national trial.



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