

Challenges in multidisciplinary care: Post-mastectomy Radiation Therapy after neoadjuvant chemotherapy

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Goals

- Review indications for post-mastectomy radiation therapy (PMRT) with adjuvant chemotherapy.
- Discuss importance of nodal evaluation prior to neoadjuvant chemotherapy.
- Outline timeline for sequencing chemotherapy, surgery, reconstruction (if applicable), and radiation therapy.

Indications for PMRT

- T3/T4 primary tumor.
- >3 axillary nodes involved.
- Positive margins with additional adverse feature such as age, grade, size, multiple positive margins, or lymphatic space invasion.

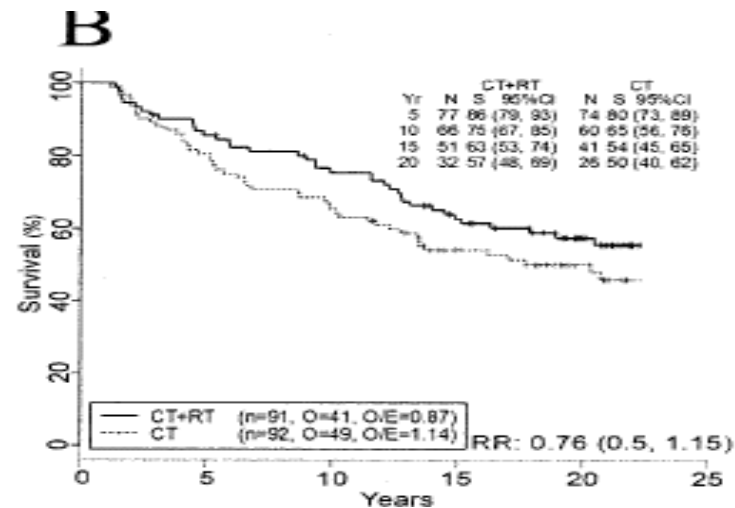
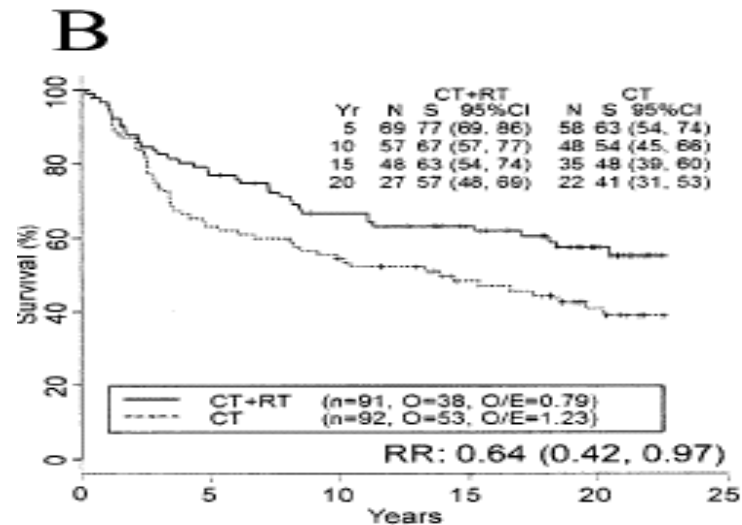
Controversial

- 1-3 positive axillary nodes.

Randomized data: Canadian Trial, Just the 1-3 + node group

Still see benefit in this group both in breast cancer specific and overall survival.

Magnitude of benefit is slightly less than in the 4 or more node + group.



Patients selected for neoadjuvant chemotherapy

- Inflammatory breast cancer.
- T3/4 primary tumor.
- Advanced nodal disease.
- Poor tumor to breast ratio in patient desiring breast preservation therapy.

For the patients without known nodal involvement and an operable primary tumor (e.g. T2Nx), the decision to add PMRT is very difficult.

Questions

- What is the best method of evaluating the nodes prior to chemotherapy?
- Is there a benefit for PMRT in stage II (T1N1, T2N1, T3N0) after preoperative chemotherapy?
- Should the extent of pathologic response in the positive axilla change the radiation fields?

Methods of evaluating nodes prior to chemotherapy

- Sentinel lymph node biopsy
- FNA of abnormal nodes seen on ultrasound : ultrasound has a low sensitivity (49-87%) but with FNA is very specific (97-100%)
- PET: not sensitive but is specific (sensitivity 37-77%, specificity 96-100%)

Sentinel Node biopsy prior to chemotherapy

Advantages

- Allows for pathologic nodal staging.
- False negative rate is well known and low.
- Improves decision making for PMRT.

Disadvantages

- May delay start of chemotherapy if axillary dissection is performed.
- If axillary dissection is performed, cannot evaluate nodal response to chemotherapy.
- If axillary dissection is not performed, will require 2 surgeries.

Benefit of PMRT after neoadjuvant chemotherapy

- No randomized trials examining use of PMRT in this setting.
- Retrospective review from MDACC shows that PMRT reduced the recurrence rate and improved cause specific survival in patients with clinical T3, stage III-IV tumor, or >3 positive nodes. (JCO 2004 22: 4691-9)
- For those patients who achieve a pathologic complete response, PMRT improved the 10 year local regional recurrence rate in patients with Stage III disease (7.3% vs. 33.3%), according to an additional review by MDACC. (IJROBP 2007 68: 1004-9)

Appropriate radiation fields after neoadjuvant chemotherapy

- Recall that the randomized PMRT trials showing a benefit in overall survival included internal mammary nodes. There is no additional data from trials saying if these fields are necessary.
- When including axillary nodal beds and supraclavicular nodes, it is important to use CT treatment planning with contouring of nodal levels.
- The position of the levels I, II, and III vary with arm position, especially with the extended arm position used for CT scanning where the level I nodes move anteriorly and level II and III move posteriorly and medially. (AM J Cl Oncol 2009 32: 381-6).
- Unfortunately, there is significant variation in target contouring among observers which is dosimetrically significant and no consensus is yet established. (IJROBP 2009 73:944-51)

Reconstruction and PMRT

- Two truisms: *It is always easier to radiate a chest wall without reconstruction ; and Any reconstruction will look better without radiation.*
- An expander or implant often make it difficult to treat all of the target volume such as the chest wall and internal mammary nodes without inclusion of some of the contralateral breast or more lung.
- While both implant and autologous tissue reconstruction have complications after radiation, autologous tissue appears to have better cosmetic results.
- The problem in the neoadjuvant chemotherapy setting is the time delay caused by the reconstruction and the amount of time needed to adequately heal prior to starting radiation.

Options for reconstruction

- Immediate reconstruction with autologous tissue
- Placement of expander with implant exchange prior to radiation.
- Placement of expander with implant exchange after radiation.
- “Delayed-immediate” reconstruction with placement of expander prior to radiation and autologous reconstruction after completion of radiation.

