

**Delay in starting whole breast radiotherapy and the effect it has on local recurrence in patients with conservative surgery for breast cancer: experience from National Cancer Institute of Sri Lanka.**

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**Abstract**

*Introduction* A rise in cancer incidence is experienced globally and many countries has experienced prolongation of waiting time for radiotherapy. In breast conservation therapy, whole breast radiotherapy is an essential component and in Sri Lanka only the National Cancer Institute, Maharagama is equipped with Linear accelerators capable of delivering conformal therapy for these patients. Therefore, we, obviously have a waiting list for radiotherapy but the extent of it was never assessed. Furthermore, the effect of this waiting time on breast cancer patients' outcomes has been never assessed for Sri Lankans and the findings from other countries are not definitive.

*Objectives* The primary objective of this study was to describe the average waiting time for radiotherapy and the associated factors for recurrence among patients who had undergone breast conservation surgery for non-metastatic breast cancer at NCIM

*Method* Retrospective cross-sectional analytical study was conducted in 2018 December using all follow up records of breast cancer patients with conservation surgery, who underwent whole breast radiotherapy at the NCIM Linear accelerator machine between 2012 January and 2013 December.

*Results* 156 patients were eligible for the study, but outcome details were only available for 142. There were 14 patients with local recurrence, 14 with distal metastasis and 7 deaths as of December 2018 in this cohort of patients. 82 of the 156 has had both chemotherapy and radiotherapy while 62 has had radiotherapy alone. The mean time gap between surgery and radiotherapy for the whole group was 190.08 days (SD 84.33days). This value was 134.08 days (SD 63.38) for radiotherapy only patients and 232.87 days (SD 72.92) for the other group. No significant association between the

mean delay and local recurrence was found by Mann – Whitney U test for the whole sample ( $p= 0.610$ ) or for any of the sub groups. The multivariate analysis also failed to find a significant increase in the local recurrence risk from having a time gap of more than 20 weeks between surgery and radiotherapy in the whole sample ( $p=0.259$ ) or in the radiotherapy only sub group ( $p=0.355$ ). But, having non-luminal molecular sub type was found to be a risk factor for local recurrence in both the whole sample ( $p = 0.037$ ) and the chemotherapy given sub group ( $p= 0.020$ ).

Risk of metastasis was found to be positively associated with node positivity and intra radiotherapy delay of 7 days or more in the whole sample as well as the chemotherapy given sub group. When all adverse events were considered, a positive association was noted between node positivity and non-luminal molecular sub type in the whole sample and in the chemotherapy give subgroup.

Interestingly, having a time gap of more than 20 weeks was found to be protective of metastasis ( $p=0.040$ ) and all adverse events ( $p= 0.022$ ) when multivariate analysis was applied to the whole sample.

*Conclusion* Although our mean radiotherapy waiting time is much longer than the reported values from other countries, it appears to have no significant effect on the local recurrence risk in breast cancer patients with conservative surgery. Non-luminal molecular sub type and lymph node involvement were found to be more consistent risk factors for all disease outcomes. Further studies, like a larger cohort analysis should shed more light to this area.