

Promising radiotherapy classifier for early breast cancer

A gene expression-based Adjuvant Radiotherapy Intensification Classifier (ARTIC) could differentiate between patients with early breast cancer who would benefit from whole-breast radiotherapy following breast-conserving surgery and those with a higher risk of locoregional recurrence who need more intensive treatment, according to a recent study.

By using three publicly available gene expression datasets from patients with early breast cancer, Martin Sjöström (Lund University, Lund, Sweden) and colleagues derived the clinicogenomic classifier ARTIC—which is based on 27 genes and patients' age. ARTIC was validated in data from 748 patients in the SweBCG91-RT trial—a multicentre, randomised trial in which patients with stage I–II breast cancer were randomly assigned to receive either adjuvant radiotherapy or no radiotherapy following breast-

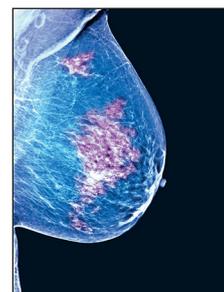
conserving surgery. The primary endpoint was cumulative incidence of locoregional recurrence. The researchers also assessed the predictive ability of eight previously published genomic signatures on the benefits of radiotherapy in the SweBCG91-RT trial.

In patients who received radiotherapy, ARTIC was prognostic of locoregional recurrence (hazard ratio [HR] 3.4, 95% CI 2.0–5.9; $p < 0.001$) and predictive of benefit from radiotherapy ($p_{\text{interaction}} = 0.005$). Greater benefits from radiotherapy were noted in patients with low ARTIC scores (HR 0.33, 95% CI 0.21–0.52; $p < 0.001$; 10-year cumulative incidence of locoregional recurrence: 6% with radiotherapy vs 21% without), but patients with high ARTIC scores derived less benefit from radiotherapy (HR 0.73, 95% CI 0.44–1.2; $p = 0.23$; 10-year cumulative incidence of locoregional recurrence: 25% with radiotherapy vs 32%

without). Of the eight previously published signatures, none could predict radiotherapy benefits in the SweBCG91-RT trial.

Sjöström commented, “Being the first such classifier successfully validated retrospectively in a randomized trial, [ARTIC] has the potential to tailor the post-operative radiotherapy for women with breast cancer based on the transcriptomic profile of the tumor.” Meena Moran (Yale University School of Medicine, New Haven, CT, USA) said, “It could be a very useful tool in any country to identify high-risk patients who may need treatment intensification, just as much for low [and] middle-income countries as high-resource countries, with the caveat that the test has to be made commercially available and accessible in low and middle-income countries.”

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