Prediction of Local Recurrence in Ductal Carcinoma in Situ: Clinical Validation of DCIS Score

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BACKGROUND

- DCIS is associated with high risk, but treatment is recommended due to a risk of recurrence (DCIS or invasive cancer).
- Many factors will be treated by breast-conserving surgery (BCS), often followed by radiation therapy (RT).
- BCS alone is an option for individuals with low-risk locoregional LR.1,4
- Currently, LR risk is estimated based on clinicopathologic factors and provides an average risk derived from population studies.
- For example, younger patients or patients with higher grade are considered higher risk and are generally treated more aggressively.
- Multifocality has been shown to be a significant predictor of LR in patients treated with breast conserving surgery (BCS) who did not receive RT.
- The current challenge is that traditional clinical factors and pathologic features of DCIS do not reliably identify individuals at low risk of recurrence after BCS.
- Biomarkers are needed to improve risk assessment of individuals with BCS treated by BCS.
- The DCIS Score™ Assay (Figure 1) was initially validated in a cohort of patients from the ECOG 5194.
- The study was selected based on biopsy and other surgical excisions and provided individualized estimates of the 10-year risk of LR in patients with DCIS or BCS treated by BCS alone.
- We recently evaluated the ability of the DCIS Score to predict the risk of an event (LR) in patients from the Ontario study population diagnosed with pure DCIS from 1994-2003 and treated by BCS alone.

METHODS

- Study Population: The study cohort consisted of an established population-based cohort of individuals diagnosed with pure DCIS from 1994-2003, treated with BCS alone, and with negative resection margin (no ink on tumor).
- Primary chart review and operative reports were used to validate surgical treatment, radiation, and outcomes.
- Expert breast pathologists centrally reviewed all available H&E slides from each case. Cases with atypical hyperplasia, lobular carcinoma in situ, invasive carcinoma, or positive margins were excluded.
- Pathology was centrally reviewed for tumor size, grade, subtype, presence of multifocality (defined as at least two loci of DCIS 5mm apart), comedonecrosis, and tumor size.
- The DCIS Score result was obtained by quantitative RT-PCR.
- The results were evaluated as a continuous score (0–100), and by pre-specified risk groups (low risk, intermediate risk, or high risk).
- The DCIS Score result is associated with the risk of overall LR and invasive LR in a population of patients with pure DCIS treated with BCS alone.

RESULTS

- The primary analysis showed that the DCIS Score result was strongly associated with LR in the group of patients with BCS alone and negative margins.
- The association of the DCIS Score result with LR in the ER-positive group was similar to the association in the overall population.

Table 1: Cohort Demographics

- The DCIS Score result showed significant differentiation between low risk and intermediate or high risk.
- In all subgroups, with the exception of those with multifocal DCIS, patients with low DCIS Score results had lower 10-year rates of LR than those in higher score groups.

Table 2: Multivariable Analysis: Factors Associated with Local Recurrence

- The DCIS Score result is associated with the risk of overall LR and invasive LR in a population of patients with pure DCIS treated with BCS alone.
- For DCIS patients treated with BCS alone, the score, local recurrence, tumor size, and histologic subtype provide independent LR information.
- Patients with low DCIS Score results and non-malignant disease may be considered for BCS alone.
- This information can improve decision-making and the management of DCIS by helping clinicians/patients weigh risk of recurrence with benefits of treatment.

Figures 1 to 9: Study Cohort, Table 1, Table 2, Figures 3, 5, 6, 8

REFERENCES

- Henderson General Hospital, Hamilton, ON, Canada; 9Thunder Bay Regional Health Sciences Centre, Thunder Bay, ON, Canada; 10Health Sciences North Sudbury, Sudbury, ON, Canada; 11Mount Sinai Hospital, Toronto, ON, Canada.